Minutes of the Ordinary Meeting of the Campbelltown City Council held on 22 March 2016

Present His Worship the Mayor, Councillor P Hawker
Councillor F Borg
Councillor G Brticevic
Councillor A Chanthivong
Councillor S Dobson
Councillor W Glynn
Councillor G Greiss
Councillor R Kolkman
Councillor P Lake
Councillor D Lound
Councillor A Matheson
Councillor C Mead
Councillor M Oates
Councillor T Rowell
Councillor R Thompson

Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson Councillor Hawker.

Council Prayer

The Council Prayer was presented by the General Manager.

Minute Silence

The Chamber was upstanding to observe a minute silence for the tragic loss of a local high school teacher in a recent motor vehicle collision.

1. APOLOGIES

Nil.

2. CONFIRMATION OF MINUTES

2.1 Minutes of the Ordinary Meeting of Council held 16 February 2016

It was **Moved** Councillor Thompson, **Seconded** Councillor Lake that the Minutes of the Ordinary Meeting of Council held 16 February 2016, copies of which have been circulated to each Councillor, be taken as read and confirmed.

25 The Motion on being Put was **CARRIED**.

3. DECLARATIONS OF INTEREST

Declarations of Interest were made in respect of the following items:

Pecuniary Interests

Nil

Non Pecuniary – Significant Interests

Councillor Kolkman - Corporate Governance - Confidential Item 24.1 - Licence Agreement for Campbelltown Camden District Band Incorporated - Councillor Kolkman advised that he is a patron member of the Campbelltown Camden District Band Incorporated and that he will leave the chamber and not take part in debate nor vote on the matter.

Councillor Hawker - Planning and Environment - Item 2.4 - Planning Proposal - Rezoning of the Glenfield Waste Site - Councillor Hawker advised that he is a member of the Joint Regional Planning Panel and he will leave the chamber and not take part in debate nor vote on the matter.

Councillor Lake - Planning and Environment - Item 2.4 - Planning Proposal - Rezoning of the Glenfield Waste Site - Councillor Lake advised that he is a member of the Joint Regional Planning Panel and he will leave the chamber and not take part in debate nor vote on the matter.

Councillor Hawker - Item 17.2 - Macquarie Fields House - Councillor Hawker advised that he is a member of the Joint Regional Planning Panel and he will leave the chamber and not take part in debate nor vote on the matter.

Councillor Lake - Item 17.2 - Macquarie Fields House - Councillor Lake advised that he is a member of the Joint Regional Planning Panel and he will leave the chamber and not take part in debate nor vote on the matter.

Non Pecuniary – Less than Significant Interests

Councillor Matheson - Planning and Environment - Item 2.4 - Planning Proposal - Rezoning of the Glenfield Waste Site - Councillor Matheson advised that a family member of the proponent is known to her.

Councillor Chanthivong advised that as a member of the NSW State Parliament he will seek legal advice regarding his need to declare an interest on any issues that may potentially involve the NSW State Government. Councillor Chanthivong noted that if issues arise where he considers there may be a perceived conflict necessitating him to declare an interest he will do so and if appropriate leave the chamber.

Councillor Brticevic advised that he is an employee of the NSW Police Force and if he considers there may be a perceived conflict necessitating him to declare an interest, he will do so and if appropriate, leave the Chamber.

Other Disclosures

Nil

4. MAYORAL MINUTE

No mayoral minute this round

5. PETITIONS

No Petitions this round

6. CORRESPONDENCE

6.1 The Hon Paul Toole MP

Attachments

Copy of letter to Council from the Hon Paul Toole MP (contained within this report)

Fit for the Future reform update from the Minister for Local Government.

Officer's Recommendation

That the letter be received and the information be noted.

Council Meeting 22 March 2016 **(Greiss/Rowell)**

That the Officer’s Recommendation be adopted.

Council Resolution Minute Number 26

That the Officer’s Recommendation be adopted.

ATTACHMENT 1

The Hon Paul Toole MP
Minister for Local Government

Clr Paul Hawker
Mayor
Campbelltown City Council
PO Box 57
CAMPBELLTOWN NSW 2560

MAR10'16 08:03:00 RCVD

Dear Clr Hawker

The deadline for submissions to delegates on the Government's 35 original merger proposals has now closed, so it is timely to provide an update on the Government's Fit for the Future reforms. Thank you for your continued involvement in this process, particularly to those who are directly participating in the council boundary review process.

The public inquiries conducted by delegates have provided councils and the community with the opportunity to have direct input into this process and delegates have met with each council affected by a merger proposal. The delegates will prepare their reports having regard to the factors outlined in the *Local Government Act 1993*.

These reports will be provided to the Local Government Boundaries Commission for review and comment. I recently announced the appointment of Mr Bob Sendt as Chairman of the Boundaries Commission. Mr Sendt, who has served as the Auditor-General of NSW, is an experienced senior public servant. He will be joined by Ms Natasa Mitic of the Office of Local Government (OLG) and two nominees of Local Government NSW, Clr Rick Firman OAM of Temora Shire Council and Clr Lesley Furneaux-Cook of Burwood Council.

Once I have considered the delegates' reports and the comments of the Boundaries Commission, I will consider whether to make recommendations to the Governor for any new local government areas.

In addition to the Government's 35 original proposals, a number of councils have made their own proposals under the Local Government Act. These have been referred to the Chief Executive of OLG for examination and report, which will occur in the same way as the Government's proposals. As a consequence of these council-initiated proposals, I have put forward three additional proposals in adjacent areas for examination and report in the event that a council-initiated proposal proceeds.
If any of these proposals replace a Government proposal, consideration will be given to funding them in the same way.

GPO Box 5341, Sydney NSW 2001
Phone: (61 2) 8574 7000 Fax: (61 2) 9339 5552 Email: office@toole.minister.nsw.gov.au

The Government anticipates that these additional proposals may be reported on by the delegates, and Boundaries Commission comments provided, in a timeframe that may enable the Government to keep its commitment of commencing any new local government areas covered by these proposals by around the middle of 2016. Should any further proposals be made by councils, the Government will continue to assess whether they satisfy the requirements for a proposal under the Local Government Act and if so, refer them for examination and report as required under the Act. The timeframe during which they are then considered under the Act is a matter for the Chief Executive of OLG or his delegate and then the Boundaries Commission. It may be likely that consideration of any further proposals may occur subsequent to the proposals under current consideration.

The Government's consideration of council-initiated proposals demonstrates our desire to work with councils on local government reform and underscores the fact that no final decision has been made about any proposal. The Government is committed to doing what is in the best interest for ratepayers through sustainable councils that can deliver the services and infrastructure that ratepayers deserve.

The Government remains committed to allowing councillors that are supportive of making the new council a success the opportunity to shape the future of the new council.

If you have any further questions, please do not hesitate to contact Corin Moffatt on 02 8574 7016.

Yours sincerely

Paul Toole MP
Minister

Reports of the Planning and Environment Committee Meeting to be held at 7.30pm on Tuesday, 15 March 2016.

APOLOGIES

ACKNOWLEDGEMENT OF LAND

DECLARATIONS OF INTEREST

Pecuniary Interests

Non Pecuniary – Significant Interests

Non Pecuniary – Less than Significant Interests

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Minutes of the Planning and Environment Committee held on 15 March 2016

Present

Councillor G Greiss (Chairperson)
Councillor R Kolkman
Councillor D Lound
Councillor M Oates
Councillor T Rowell
Councillor R Thompson
General Manager - Mrs L Deitz
Director Strategy - Mr J Lawrence
Acting Director Planning and Environment - Mr J Baldwin
Manager Community Resources and Development - Mr B McCausland
Acting Manager Development Services - Mr B Leo
Manager Emergency Management and Community Safety - Mr R Blair
Acting Manager Sustainable City and Environment - Mrs R Winsor
Senior Development Planner - Mr L Joseph
Senior Strategic Environmental Planner - Mrs R Haddad
Manager Governance and Risk - Mrs M Dunlop
Executive Assistant - Mrs D Taylor

Apology

(Rowell/Thompson)

That the apology from Councillor Matheson be received and accepted.

CARRIED

Also in Attendance

At the conclusion of the City Works Committee Meeting the following Councillors attended the Planning and Environment Committee:

His Worship the Mayor, Councillor Hawker - item 3.4 only
Councillor Mead - from item 3.4 to the conclusion of the Planning and Environment Committee meeting

Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson Councillor Greiss.

DECLARATIONS OF INTEREST

There were no Declarations of Interest at this meeting.

1. WASTE AND RECYCLING SERVICES

No reports this round

2. ENVIRONMENTAL PLANNING

2.1 Resources for Regions

Reporting Officer

Manager Environmental Planning

Attachments

Nil

Purpose

To update Council on the NSW Government's mining royalties program, Resources for Regions.

History

At its meeting on 21 September 2010 Council considered a report on the Association of Mining Related Councils (AMRC) draft Royalties for Regions Plan.

A Mining Royalty is the price charged by the Crown for the transfer of the right to extract a mineral resource. Previously revenue raised from mining royalties in NSW was solely directed to consolidated revenue and spent as determined by the State Government.

At this time the AMRC was investigating alternative royalty models for NSW and developed a proposed model based on the Western Australian 'Royalties for Regions' Policy. Under this policy 25% of that State's mining royalties are distributed to regional communities.

The AMRC advised that it intended to engage a suitably qualified consultant to examine the viability and merits of the proposal. In this regard, Council subsequently resolved:

> "That Council consider the outcome of the consultancy review of the Association's Royalties for Regions Plan, when the information becomes available."

Despite the intentions of the AMRC, a review of the proposed plan did not proceed and the AMRC continued to lobby the NSW Government to examine its mining royalty distribution.

Report

In 2013 the NSW Government introduced the Resources for Regions program which aimed to relieve infrastructure constraints and support NSW communities affected by mining. Funding under the program was available for projects in Local Government Areas (LGAs) deemed to be 'mining affected' based on mining-related royalties (total and per capita), truck movements and employment in the mining industry. Funding was allocated through a competitive grants process. To date funding has been made available to 11 LGAs, however, the Campbelltown LGA has not been eligible due to it not being evaluated as 'mining affected'.

In December 2015 the State Government announced changes to its Resources for Regions program. Funding will be available to all regional and rural LGAs, (outside of Sydney, Newcastle and Wollongong), that can demonstrate that they are 'mining affected'. The Government also announced that NSW agencies will not be eligible for funding.

Despite the expansion of the program, Campbelltown still remains ineligible as it is deemed to be a part of Sydney. Notwithstanding this impediment, it would most likely be difficult for Council to obtain funding under the program given the comparatively minor impact on our community from mining and its minor mining royalties per capita. Only one longwall mine is currently in operation below the suburb of Wedderburn, which is 90% extracted. Following completion of this mine, longwall mining within Campbelltown will cease for the foreseeable future and focus on the Douglas Park area, within the adjoining Wollondilly LGA. The only other mining operation currently occurring within Campbelltown is associated with a number of coal seam gas wells within the Menangle Park area. Given the NSW Government's policy on coal seam gas exclusion zones and AGL's recent announcement that the Camden Gas Project will cease in 2023, it is unlikely that mining activities will expand within the LGA.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: **(Kolkman/Rowell)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Greiss/Kolkman)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 27

That the Officer's Recommendation be adopted.

2.2 Water Quality Monitoring Program - Half Yearly Report

Reporting Officer

Manager Environmental Planning

Attachments

1. Compliance of Council's water quality monitoring sites with water quality criteria (contained within this report)
2. Classification of Recreational Water Environments for primary contact (contained within this report)

Purpose

To inform Council of the results of Council's Water Quality Monitoring Program (WQMP) for the six month period from July 2015 to the end of December 2015.

History

The Campbelltown Local Government Area (LGA) is located within the catchments of two principal Sydney waterways; the Georges and Nepean River systems. These waterways support a diverse variety of plants and animals, as well as provide for community amenity and recreation opportunities.

The majority of Campbelltown's urban waterways flow into the Upper Georges River, either directly to the Georges River itself or via the Bow Bowing/Bunbury Curran Creek system. Approximately 86% of the LGA lies within the Georges River catchment whilst the remaining 14% of the LGA lies within the Hawkesbury-Nepean River catchment.

Water quality within the catchments has been influenced by rapid urbanisation over time. Currently, 99% of Campbelltown's population resides within the Georges River Catchment. In addition, 100% of the LGA's commercial, industrial and business centre areas are also located within this catchment and principally within the Bow Bowing/Bunbury Curran sub-catchment.

Key pressures that have the potential to negatively impact on the quality of Campbelltown's water resources include:

- urbanisation
- stormwater runoff
- pollution spills
- illegal dumping
- litter accumulation
- aquatic noxious weeds
- degraded riparian vegetation
- altered flood regimes.

Report

Council's current WQMP involves the sampling and monitoring of 13 strategically selected sites within the Georges River and the Nepean River Catchments against National Guidelines for Fresh and Marine Water Quality, developed by the Australian and New Zealand Environment and Conservation Council (ANZECC 2000). Three sites are also assessed against the National Health and Medical Research Council Guidelines, Managing Risks in Recreational Areas (NHMRC 2008) as they are known to be used for recreational swimming (primary recreational contact).

The water quality testing sites have been strategically selected to ensure data is collected across a broad section of the catchment including sensitive and high profile locations such as environmental protection areas, recreational swimming spots and stormwater discharge points from urban areas.

ANZECC Guidelines and Monitoring Results

The water quality data collected from each site has been compared to a set of compliance range standards for each water quality parameter as determined by the ANZECC guidelines for ecosystem health, and secondary contact recreation. Secondary recreational contact relates to activities that generally have less-frequent body contact with the water; for example, boating or fishing.

The following sites were sampled on a monthly basis between July 2015 and December 2015:

- Menangle Bridge (Menangle)
- Wedderburn Gorge (Wedderburn)
- The Woolwash (Airds)
- Frere's Crossing (Kentlyn)
- Fisher's Ghost Creek (Bradbury)
- Simmo's Beach (Macquarie Fields)
- Kooringa Reserve (Varroville)
- Bow Bowing Creek gross pollutant trap (Minto)
- Park Central, north pond (Campbelltown)
- Park Central, central pond (Campbelltown)
- Mandurama Reserve (Ambarvale)
- Harold Street Bridge (Macquarie Fields)
- Cambridge Avenue (Glenfield).

Attachment 1 provides a diagrammatic representation of the percentage compliance and rating of Council's water quality monitoring sites with water quality criteria over the six month period.

The water quality monitoring data for this period indicates that predominately, water quality throughout the LGA remained consistent with previous reporting cycles. Some slight reductions and improvements in water quality were experienced, particularly in some water quality parameters and/or some locations. These variations are most likely attributable to high velocity rainfall events experienced during the reporting period. Key observations are as follows:

- Percentage compliance for dissolved oxygen (DO) continues to be 'very poor' across almost all sites. However, although the number of samples falling within the range prescribed under the guidelines has decreased, a close examination of the raw data reveals that the readings are largely only just below the minimum accepted level, particularly for those sites adjacent to rural and bushland areas.

- Turbidity levels in the Georges River continue to show 'very poor' compliance with the ANZECC guidelines. However, the non-compliance is a result of the method by which this criteria is expressed. Turbidity is expressed as a range which recognises that some level of Turbidity is acceptable. In the case of the Georges River, recorded Turbidity levels do not fall within the accepted range, as the Georges River is of sufficient clarity to reveal levels of Turbidity less than the accepted Turbidity range.

- Water quality at Kooringa Reserve and the Minto GPT monitoring sites remained 'poor' for aquatic ecosystem health, which is not unexpected due to the existence of stormwater detention areas at both sites. Along with Manduramah Reserve, these three sites recorded the lowest rates of compliance with the ANZECC guidelines within the Campbelltown LGA.

- Despite it's continued 'poor' rating, results at Manduramah Reserve, Ambarvale showed a slight improvement for both aquatic ecosystem health and secondary contact recreation compared to previous monitoring periods. These results could be attributed to the various environmental actions being undertaken under the Australian White Ibis Management Plan for Lake Manduramah. Improvements to water quality are also anticipated as a result of the upcoming 'Catch-a-carp' competition.

- Results at Cambridge Avenue, Glenfield continued to show consistent improvement compared to previous monitoring periods, suggesting that there is some natural water quality treatment occurring along the catchment.

- Heavy rainfall at the end of October and early November caused significant spikes in bacterial levels at four of the sampling sites - Harold St Bridge, Bunburry Curran Creek; Park Central, North Pond; Park Central, Central Pond; and Mandurama Reserve, Ambarvale. As a result of these recent high velocity rainfall events, faecal coliform and enterococci levels were recorded outside the guidelines. These indicator readings provided anecdotal evidence to suggest that a sewer overflow or leak may have occurred during this heavy rainfall period, and as such Sydney Water was formally contacted, informed of the results and requested to investigate.

- The Woolwash recorded the highest level of compliance with the ANZECC guidelines and was rated as 'good' for both aquatic ecosystem health and secondary contact recreation.

NHMRC Guidelines and Monitoring Results

The NHMRC guidelines are considered the most industry relevant for assessing risks to human health from primary contact with recreational water bodies and require the analysis of bacterial levels within a waterbody over a five year period. Results from sampling at three sites known to be used for recreational swimming were analysed against the NHMRC guidelines:

- Simmo's Beach (Macquarie Fields)
- Menangle Bridge (Menangle)
- The Woolwash (Airds).

When analysing the bacterial results for the six month period against the prescribed value ranges, the water quality for both the Woolwash and Menangle Bridge was rated as 'good', whilst Simmo's Beach was rated as 'fair', as shown in Attachment 1.

However as mentioned above, the NHMRC guidelines require analysis of bacterial levels over a five year period, meaning any overall positive improvement as a result of management measures and pollution control could take several years before becoming evident in reporting results. Attachment 2 shows the classification of the recreational water environment at Simmo's Beach, Menangle Bridge and the Woolwash against the NHMRC guidelines for the five year period.

Based on this assessment the classification of both Simmo's Beach and Menangle Bridge continued to be rated as 'very poor' and 'poor' respectively. The Woolwash was assessed as 'very good', showing no significant peaks in bacterial levels during the sampling period.

Management Actions

Council continues to investigate and undertake actions aimed at improving water quality within the Campbelltown LGA, including:

- The construction of a wetland in Cleopatra Reserve, which forms the headwaters of the Spring Creek catchment was completed during the reporting period. Undertaken in partnership with the Greater Sydney Local Land Services (LLS), the project aimed to improve water quality by filtering stormwater runoff from nearby Lake Mandurama and the surrounding residential area. The wetland covers an area of almost 4,000 square metres and has been planted with more than 15,500 aquatic and terrestrial plants.

- Council's Sustainable Catchments Working Party launched two projects focused on improving the health of our local catchments - 'Let's get Quirky' and 'Catchments Connecting Communities'. The 'Let's get Quirky' project aims to revitalise Quirk Reserve in Bradbury through modifications to the water course, increased planting of endemic species, and the introduction of no-mow zones. 'Catchments Connecting Communities' was delivered in partnership with the Western Sydney University's Love Your Lagoons program. Students from Campbelltown Performing Arts High School investigated environmental and social issues surrounding the Park Central wetland and developed a suite of management actions aimed to improve the local environment, increase awareness about the wetland and engage local residents with the space. Two of these projects are currently being brought to life.

Conclusion

During the reporting period, water quality in the LGA on average remained fair. Poor results continued to be recorded within the Bow Bowing/Bunbury Curran catchment; the cause of these results is most likely due to the extent and nature of urban and industrial stormwater influences within this catchment.

Results within Campbelltown's rural and bushland land use areas, including prominent recreational areas, have slightly improved or remained consistent over time. High velocity rainfall events have resulted in spikes in bacterial levels at some locations contributing to poor results for recreational contact.

The results of Council's WQMP will continue to be analysed and used to guide future works so as to ensure Council is fulfilling its commitment to improving the sustainability of its water resources and water quality within the local area.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: (Thompson/Oates)

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 (Greiss/Kolkman)

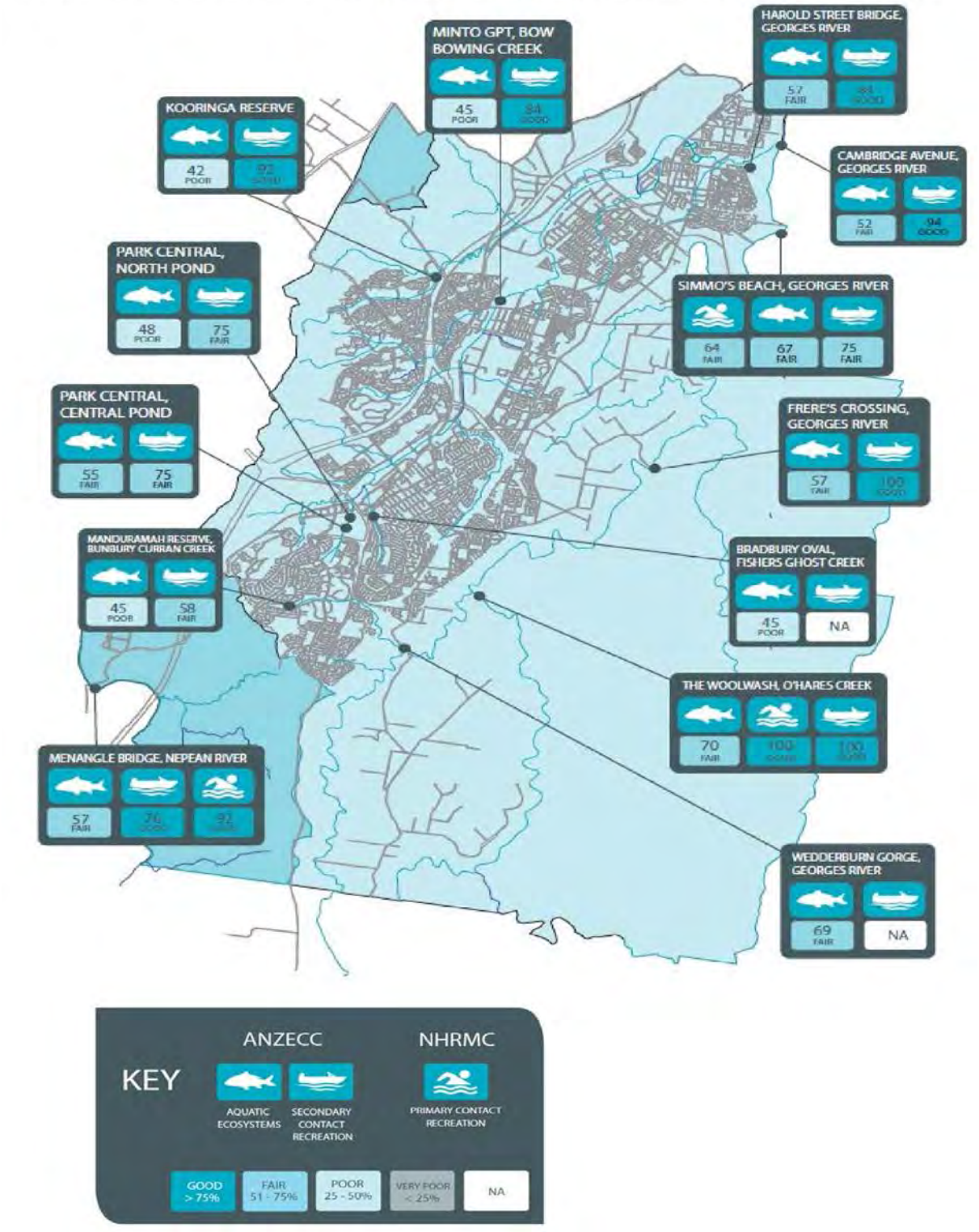
That the Officer's Recommendation be adopted.

Council Resolution Minute Number 27

That the Officer's Recommendation be adopted.

ATTACHMENT 1

Compliance of Council's water quality monitoring sites with water quality criteria



ATTACHMENT 2

Classification of Recreational Water Environments for primary contact (NHMRC, 2008)

Monitoring site	Microbial Assessment Category
Simmo's Beach, Georges River	Very Poor
Menangle Bridge, Nepean River	Poor
Woolwash, O'Hares Creek	Very Good

2.3 Amendment to Campbelltown Local Environmental Plan 2015 to reflect the Re-alignment of the Campbelltown - Camden Local Government Boundary

Reporting Officer

Manager Environmental Planning

Attachments

1. Boundary Re-alignment (contained within this report)
2. Draft Planning Proposal (contained within this report)

Purpose

To seek Council's endorsement of a draft planning proposal to amend various maps in the Campbelltown Local Environmental Plan 2015 (CLEP 2015) to be consistent with the recent gazettal of the re-alignment of the Campbelltown/Camden Local Government Area (LGA) boundary near East Leppington (Willowdale) and Emerald Hills and to forward the draft planning proposal to the Department of Planning and Environment for a Gateway Determination.

History

Council at its meeting on 9 December 2014 considered a report (Corporate Governance Committee Item 3.5 Boundary alignment – "Willowdale") on the proposed re-alignment of the Campbelltown/Camden LGA boundary, to reflect the Growth Centre development and resolved:

1. That the Campbelltown – Camden boundary be amended in accordance with the boundary alignment map as per attachment 1.

2. That Council request the Minister for Local Government refer the proposed boundary realignment to the Boundaries Commission and be implemented by the Governor.

The subsequent amendment to the Local Government Boundary was published in the NSW Government Gazette, Number 106 on 27 November 2015. There is now a requirement to amend the various maps contained within CLEP 2015 to reflect the Local Government Boundary amendment and any relevant planning provisions including associated principal development standards that apply to the impacted properties.

Report

Attachment 1 to this report contains a map showing the alignment of the former and new boundary between Campbelltown and Camden LGA's. The land contained between the subject boundary lines and located to the west of the previous local government boundary is now within the Campbelltown LGA, while the land to the east of the previous local government boundary is now within the Camden LGA. The land transferred to Campbelltown (approximately three hectares) is within two distinct areas, the first in the north within the East Leppington Precinct of the South West Growth Centre and the other in the south and abuts the "Emerald Hills' proposed development.

The land within the East Leppington Precinct was rezoned under State Environmental Planning Policy (Sydney Region Growth Centres) 2006, in March 2013. The subsequent zones and associated development standards apply across the precinct and do not have regard to the LGA boundary which traverses the site. No change is proposed to the zoning, principal development standards or maps as a result of the LGA boundary re-alignment.

The land that adjoins the "Emerald Hills' proposed development, and recently transferred to Campbelltown, is contained within three individual properties. The LGA boundary has been realigned to follow the boundary of these properties which were (before boundary realignment) already substantially within Campbelltown.

The first property (lot 1, DP 1086624) is owned by Sydney Water and is known as "Ingleburn Dam'. The portion of this premises that was previously within Camden was zoned SP2 – Water Supply System and RU2 – Rural Landscape under Camden LEP 2010. It is proposed that this land will retain the SP2 zone; and that the RU2 zone be amended to SP2 to reflect a common zoning for the site, having regard to its ownership/use. All other development standards contained within CLEP 2015 that apply to the SP2 zone will be applied to the land. Additionally it is noted that "Ingleburn Dam" is a Heritage Item and listed as Schedule 5 of CLEP 2015.

The second property (lot 5, DP 214954) is privately owned (Mr Giuseppe Agostino). The portion of this premises that was previously within Camden was zoned RU2 – Rural Landscape under Camden LEP 2010. It is proposed that this property in its entirety be zoned E3 – Environmental Management to reflect a common zoning for the site having regard to the ownership/use. All other development standards contained within CLEP 2015 that apply to the E3 zone will be applied to the land.

The third property (Lot 71 DP706546) is privately owned (Mr Dario and Angelina Petrin). The extent of the boundary variation is minor in nature, and is shown in the 'enlarged view' in attachment 1. The portion of this premises that was previously within Camden is currently unzoned as a result of the gazettal of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006, the boundary of which followed the property boundary of 71 St Andrews Road and not the LGA boundary. It is proposed that this property, in its entirety, be zoned E3 – Environmental Management to reflect a common zoning for the site having regard to its ownership/use. All other development standards contained with CLEP 2015 that apply to the E3 zone will be applied to the land.

As a result of the boundary changes, the following maps within CLEP 2015 will need to be amended:

- Land Zoning Map
- Land Application Map
- Lot Size Map
- Height of Buildings Map
- Heritage Map
- Environmental Constraint Map
- Lot Size for Dual Occupancy Development Map.

A draft planning proposal (attachment 2) has been prepared to reflect the above amendments to the CLEP 2015 resulting from the gazettal of the LGA boundary re-alignment, and subject to Council's endorsement, will be forwarded to the Department for a Gateway Determination.

In this regard, it is recommended that Council use its delegation pursuant to Section 23 of the *Environmental Planning and Assessment Act 1979* for this draft Planning Proposal. The delegation will enable Council to streamline the processing of the draft planning proposal by dealing directly with Parliamentary Counsel for the making of the plan rather than through NSW Planning and Environment. The request for delegation will be made as part of the Gateway submission.

Subject to the conditions of the Gateway Determination, it is recommended that the proposal, upon receipt of the Gateway Determination, proceed to public exhibition without reporting this matter back to full Council. Councillors would be advised of the outcome of the Gateway Determination and the dates of the public exhibition via a Councillors Weekly Memo. However, if the Gateway Determination included an unexpected requirement from the Department, this matter would be reported back to Council, prior to the commencement of the public exhibition. Regardless of which process the Council chooses (i.e. reporting or not reporting prior to public exhibition), the matter will be reported back to Council following the conclusion of the public exhibition period.

Following the above, it is recommended that subject to the issue of a positive Gateway Determination the draft Planning Proposal be placed on public exhibition for 28 days at Council's Civic Centre, Libraries and on Council's website, in accordance with the legislative requirements of the *Environmental Planning and Assessment Regulation 2000.* Consultation during that period will also occur with any public authorities specified in the Gateway Determination.

A public notice would be placed in the two local papers advising of the public exhibition of the draft planning proposal. Whilst the three property owners have been contacted regarding the proposed amendments, letters would also be sent to the three property owners advising of the public exhibition.

It is noted that Camden Council have commenced a similar process for the land transferred into their LGA and Council officers will work with Camden Council to ensure that the changes to the relevant instruments occur in an integrated manner in order that land owners have clarity regarding the planning amendment process and the controls that apply to their land.

Officer's Recommendation

1. That Council support the planning rationalisation process and specifically the draft Planning Proposal shown as attachment 2 to this report and endorse its referral to the Department Planning and Environment for a Gateway Determination.

2. That Council use its delegation pursuant to Section 23 of the *Environmental Planning and Assessment Act 1979* to advance the Planning Proposal.

3. That subject to the Gateway Determination, containing "standard conditions", Council place the draft Planning Proposal on public exhibition for 28 days and advise the affected property owners accordingly.

4. That at the conclusion of the public exhibition, a report be submitted to Council detailing any outcome of the exhibition and a "strategy" for finalising the planning proposal amendment.

Committee's Recommendation: **(Kolkman/Lound)**

That the Officer's Recommendation be adopted.

CARRIED

Voting for the Committee's Recommendation were Councillors: Greiss, Kolkman, Lound, Oates, Rowell and Thompson.

Voting against the Committee's Recommendation: Nil.

Council Meeting 22 March 2016 **(Greiss/Kolkman)**

1. That Council support the planning rationalisation process and specifically the draft Planning Proposal shown as attachment 2 to this report and endorse its referral to the Department Planning and Environment for a Gateway Determination.

2. That Council use its delegation pursuant to Section 23 of the *Environmental Planning and Assessment Act 1979* to advance the Planning Proposal.

3. That subject to the Gateway Determination, containing "standard conditions", Council place the draft Planning Proposal on public exhibition for 28 days and advise the affected property owners accordingly.

4. That at the conclusion of the public exhibition, a report be submitted to Council detailing any outcome of the exhibition and a "strategy" for finalising the planning proposal amendment.

Council Resolution Minute Number 28

1. That Council support the planning rationalisation process and specifically the draft Planning Proposal shown as attachment 2 to this report and endorse its referral to the Department Planning and Environment for a Gateway Determination.

2. That Council use its delegation pursuant to Section 23 of the *Environmental Planning and Assessment Act 1979* to advance the Planning Proposal.

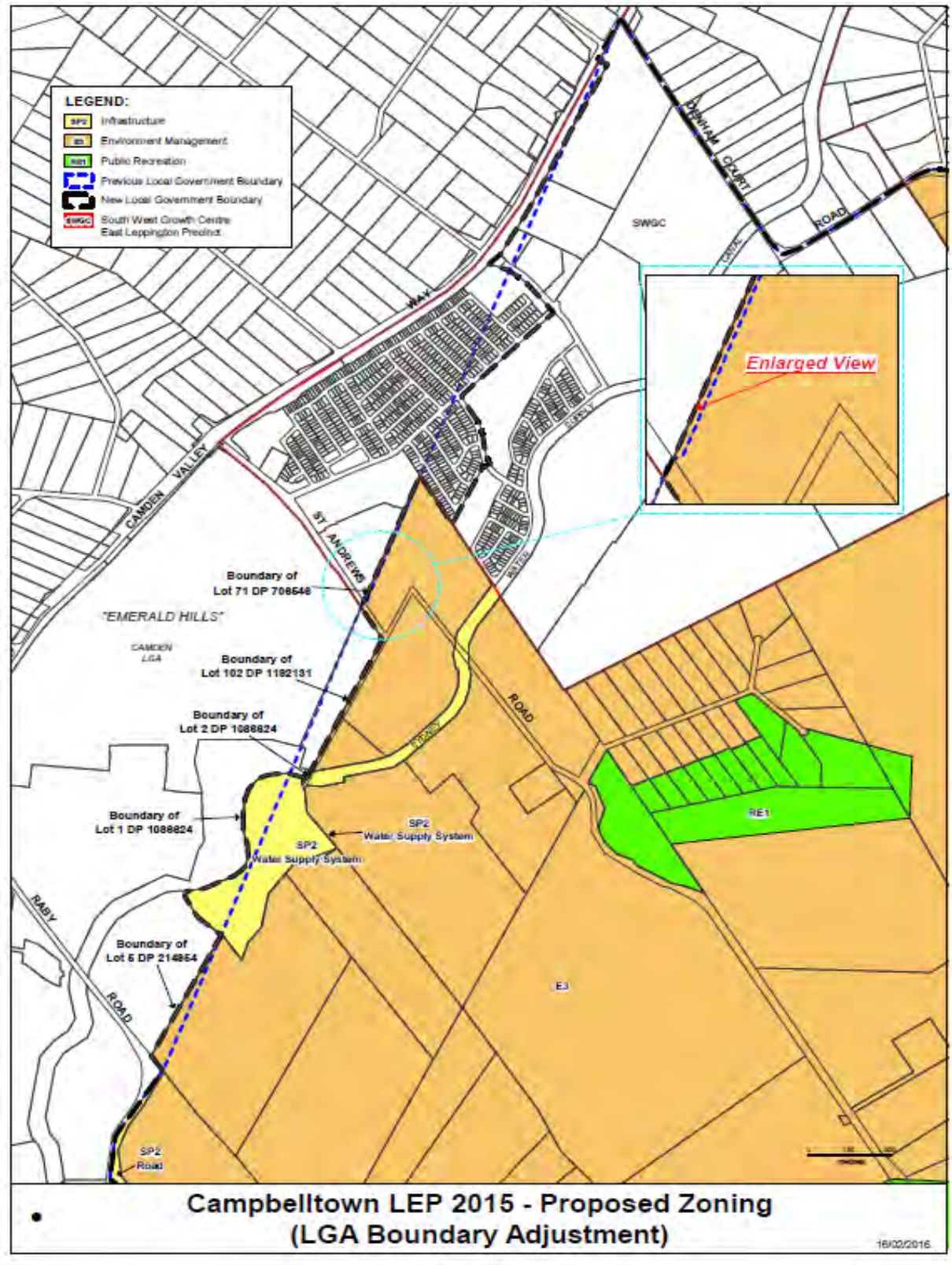
3. That subject to the Gateway Determination, containing "standard conditions", Council place the draft Planning Proposal on public exhibition for 28 days and advise the affected property owners accordingly.

4. That at the conclusion of the public exhibition, a report be submitted to Council detailing any outcome of the exhibition and a "strategy" for finalising the planning proposal amendment.

Voting for the Council Resolution were Councillors: Borg, Brticevic, Chanthivong, Dobson, Glynn, Greiss, Hawker, Kolkman, Lake, Lound, Matheson, Mead, Oates and Rowell.

Voting against the Council Resolution was Councillor: Thompson.

ATTACHMENT 1



ATTACHMENT 2

Draft Planning Proposal

Subject: Draft Campbelltown Local Environmental Plan 2015 – Amendment No. 1

Part 1 – Objectives or Intended Outcomes

The objective of this planning proposal is to amend the relevant maps under the Campbelltown LEP 2015 to reflect the amended LGA boundary between the Campbelltown and Camden LGAs.

Part 2 – Explanation of the Provisions

The Planning Proposal intends to amend the following maps under the Campbelltown LEP 2015 to reflect the re-alignment of the LGA boundary between the Campbelltown and Camden LGAs:

- Land Zoning Map - Sheet LZN_007 (1500_COM_LZN_007_020_20150428)
- Land Application Map – Sheet LAP_001 (1500_COM_LAP_001_120_20150428)
- Lot Size Map – Sheet LSZ_007 (1500_COM_LSZ_007_020_20150428)
- Height of Buildings Map – Sheet HOB_007 (1500_COM_HOB_007_020_20150428)
- Heritage Map – Sheet HER_007 (1500_COM_HER_007_020_20150428)
- Environmental Constraint Map – Sheet ECM_007 (1500_COM_ECM_007_020_20150428)
- Lot Size for Dual Occupancy Development Map – Sheet LSD_007 (1500_COM_LSD_007_020_20150428);

A detailed explanation of the proposed map amendments is included in PART 4 – MAPS of this Planning Proposal.

Part 3 – Justification

Section A – Need for the planning proposal

1. Is the planning proposal a result of any strategic study or report?

No. The Planning Proposal is required so that the Campbelltown LEP maps are consistent with the recently gazetted re-alignment of the Campbelltown and Camden LGA boundaries. The amendments are minor and administrative in nature.

2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The Planning Proposal is the best means of implementing the necessary changes to the Campbelltown LEP 2015 maps as a result of the re-alignment of the Campbelltown and Camden LGA boundaries. There is no alternative option to undertake the proposed amendments.

Section B – Relationship to strategic planning framework

3. **Is the planning proposal consistent with the objectives and actions of the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies).**

The Planning Proposal is required so that the Campbelltown LEP maps are consistent with the recently gazetted re-alignment of the Campbelltown and Camden LGA boundaries. The amendments are minor and administrative in nature, and are considered to be consistent with the Sydney Metropolitan Strategy and draft sub-regional strategy.

4. **Is the planning proposal consistent with the local council's Strategy or other local strategic plan?**

The Planning Proposal is required so that the Campbelltown LEP maps are consistent with the recently gazetted re-alignment of the Campbelltown and Camden LGA boundaries. The amendments are minor and administrative in nature and are considered to be consistent with Council Local Planning Strategy (2013).

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

State Environmental Planning Policy	Applicable	Comment	Consistent
Standard Instrument (Local Environmental Plans) Order 2006	✓	The Planning Proposal intends to amend Council's LEP conforming to the standard instrument.	✓
Standard Instrument—Principal Local Environmental Plan	✓	The Planning Proposal intends to amend Council's LEP conforming to the standard instrument.	✓
State Environmental Planning Policy No 1—Development Standards	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 14—Coastal Wetlands	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 15—Rural Landsharing Communities	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 19—Bushland in Urban Areas	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 21—Caravan Parks	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 26—Littoral Rainforests	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 29—Western Sydney Recreation Area	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 30—Intensive Agriculture	n/a	This SEPP is not relevant to the planning proposal.	n/a

State Environmental Planning Policy No 32—Urban Consolidation (Redevelopment of Urban Land)	✓	This SEPP applies to the state, however, the application primarily applies to the urban consolidation of land for the purposes of multi-unit residential development. This Planning Proposal is not inconsistent with the SEPP.	✓
State Environmental Planning Policy No 33—Hazardous and Offensive Development	✓	This SEPP applies to the state, however, the proposal is not hazardous or offensive. This Planning Proposal is not inconsistent with the SEPP.	✓
State Environmental Planning Policy No 36—Manufactured Home Estates	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 39—Spit Island Bird Habitat	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 44—Koala Habitat Protection	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 47—Moore Park Showground	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 50—Canal Estate Development	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 52—Farm Dams and Other Works in Land and Water Management Plan Areas	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 55—Remediation of Land	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 59—Central Western Sydney Regional Open Space and Residential	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 62—Sustainable Aquaculture	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 64—Advertising and Signage	✓	SEPP 64 will apply to the new land to be located within the Campbelltown LGA as a result of the boundary re-alignment. The Planning Proposal is consistent with the SEPP.	✓
State Environmental Planning Policy No 65—Design Quality of Residential Flat Development	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 70—Affordable Housing (Revised Schemes)	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy No 71—Coastal Protection	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Affordable Rental Housing) 2009	n/a	This SEPP is not relevant to the planning proposal.	n/a

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	✓	This Planning Proposal is consistent with the provisions of this SEPP.	✓
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Infrastructure) 2007	✓	This Planning Proposal is consistent with the provisions of this SEPP.	✓
State Environmental Planning Policy (Kosciuszko National Park—Alpine Resorts) 2007	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Kurnell Peninsula) 1989	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Major Development) 2005	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Penrith Lakes Scheme) 1989	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Rural Lands) 2008	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (SEPP 53 Transitional Provisions) 2011	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (State and Regional Development) 2011	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Sydney Region Growth Centres) 2006	✓	The planning proposal includes the amendment of the Campbelltown LEP 2015 maps near the East Leppington South West Growth Centre precinct which was rezoned under the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 in March 2013. The map	✓
		amendments relate to the LGA boundary at East Leppington only, and do not propose to make any changes to the SEPP. The Planning Proposal is not inconsistent with the SEPP.	
State Environmental Planning Policy (Urban Renewal) 2015	n/a	This SEPP is not relevant to the planning proposal.	n/a

State Environmental Planning Policy (Western Sydney Employment Area) 2009	n/a	This SEPP is not relevant to the planning proposal.	n/a
State Environmental Planning Policy (Western Sydney Parklands) 2009	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 8 (Central Coast Plateau Areas)	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 9—Extractive Industry (No 2—1995)	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 16—Walsh Bay	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 18—Public Transport Corridors	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 19—Rouse Hill Development Area	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997)	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 24—Homebush Bay Area	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 25—Orchard Hills	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 26—City West	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 28—Parramatta	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 30—St Marys	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan No 33—Cooks Cove	n/a	This SEPP is not relevant to the planning proposal.	n/a
Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005	n/a	This SEPP is not relevant to the planning proposal.	n/a

6. Is the planning proposal consistent with applicable Ministerial Directions (s117 directions)?

It is considered that the planning proposal is either consistent or justifiably inconsistent with all applicable s117 directions as detailed below:

Ministerial Direction	Compliance	Comment
1. Employment and Resources		
1.1 Business and Industrial Zones	N/A	This s.117 direction is not relevant to the planning proposal.

1.2 Rural Zones	N/A	This s.117 direction is not relevant to the planning proposal.
1.3 Mining, Petroleum Production and Extractive Industries	N/A	This s.117 direction is not relevant to the planning proposal.
1.4 Oyster Aquaculture	N/A	This s.117 direction is not relevant to the planning proposal.
1.5 Rural Lands	N/A	This s.117 direction is not relevant to the planning proposal.
2. Environment and Heritage		
2.1 Environment Protection Zones	Yes	The proposal intends to apply an E3 Environmental Conservation zone to land which was previously zoned RU2 – Rural Landscape, therefore not diminishing the environmental standards that apply to the land.
2.2 Coastal Protection	N/A	This s.117 direction is not relevant to the planning proposal.
2.3 Heritage Conservation	Yes	The proposal has no impact upon the heritage listing of the adjacent Sydney Upper Canal which is a State heritage item.
2.4 Recreation Vehicle Areas	N/A	This s.117 direction is not relevant to the planning proposal.
3. Housing, Infrastructure and		
3.1 Residential Zones	N/A	This s.117 direction is not relevant to the planning proposal.
3.2Caravan Parks and Manufactured Home Estates	N/A	This s.117 direction is not relevant to the planning proposal.
3.3 Home Occupations	N/A	This s.117 direction is not relevant to the planning proposal.
3.4 Integrating Land Use and Transport	N/A	This s.117 direction is not relevant to the planning proposal.
3.5 Development Near Licensed Aerodromes	N/A	This s.117 direction is not relevant to the planning proposal.
3.6 Shooting Ranges	N/A	This s.117 direction is not relevant to the planning proposal.
4. Hazard and Risk		

4.1 Acid Sulphate Soils	N/A	This s.117 direction is not relevant to the planning proposal.
4.2 Mine Subsidence and Unstable Land	N/A	This s.117 direction is not relevant to the planning proposal.
4.3 Flood Prone Land	N/A	This s.117 direction is not relevant to the planning proposal.
4.4 Planning for Bushfire Protection	N/A	This s.117 direction is not relevant to the planning proposal.
5. Regional Planning		
5.1 Implementation of Regional Strategies	N/A	This s.117 direction is not relevant to the planning proposal.
5.2 Sydney Drinking Water Catchments	N/A	This s.117 direction is not relevant to the planning proposal.
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	N/A	This s.117 direction is not relevant to the planning proposal.
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	`N/A	This s.117 direction is not relevant to the planning proposal.
5.5 Development in the vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)	N/A	This s.117 direction is not relevant to the planning proposal.
5.6 Sydney to Canberra Corridor (Revoked 10 July 2008. See amended Direction 5.1)	N/A	This s.117 direction is not relevant to the planning proposal.
5.7 Central Coast (Revoked 10 July 2008. See amended Direction 5.1)	N/A	This s.117 direction is not relevant to the planning proposal.
5.8 Second Sydney Airport: Badgerys Creek	N/A	This s.117 direction is not relevant to the planning proposal.
6. Local Plan Making		
6.1 Approval and Referral Requirements	Yes	The proposal as submitted is consistent with the objectives of this direction.
6.2 Reserving Land for Public Purposes	Yes	The proposal as submitted is consistent with the objectives of this direction.
6.3 Site Specific Provisions	N/A	This s.117 direction is not relevant to the planning proposal.

7. Metropolitan Planning		
7.1 Implementation of the Metropolitan Plan for Sydney	Yes	The Planning Proposal is consistent with the relevant actions from the draft South West Sub-regional Strategy.

Section C – Environmental, social and economic impact.

7. 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?

The Planning Proposal is required so that the Campbelltown LEP maps are consistent with the recently gazetted re-alignment of the Campbelltown and Camden LGA boundaries. The amendments are minor and administrative in nature. The application of an E3 Environmental Management zoning to land currently zoned RU2 – Rural Landscape is considered to offer greater environmental protection.

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

The Planning Proposal is required so that the Campbelltown LEP maps are consistent with the recently gazetted re-alignment of the Campbelltown and Camden LGA boundaries. The amendments are minor and administrative in nature and no adverse environmental impacts are likely to occur as a result of the Planning Proposal.

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

The Planning Proposal is required so that the Campbelltown LEP maps are consistent with the recently gazetted re-alignment of the Campbelltown and Camden LGA boundaries. The amendments are minor and administrative in nature and no adverse social or economic impacts are likely to occur as a result of the Planning Proposal

Section D – State and Commonwealth interests.

10. Is there adequate public infrastructure for the planning proposal?

The Planning Proposal is required so that the Campbelltown LEP maps are consistent with the recently gazetted re-alignment of the Campbelltown and Camden LGA boundaries. The amendments are minor and administrative in nature, and do not propose any intensification of land use or rezoning of land to enable development to occur. The Planning Proposal does not place any additional demand upon existing public infrastructure.

11. What are the views of state and Commonwealth public authorities consulted in accordance with the gateway determination?

State and Commonwealth public authorities have not been consulted at the pre-Gateway stage. However, given that the planning proposal is administrative in nature and reflects the recent gazettal of the re-aligned LGA boundary between Campbelltown and Camden Councils, it is proposed that agency consultation will be limited.

Part 4 – Mapping

The following maps are provided as attachments to this planning proposal:

- Land Zoning Map - Sheet LZN_007 (1500_COM_LZN_007_020_20150428)
- Land Application Map – Sheet LAP_001 (1500_COM_LAP_001_120_20150428)
- Lot Size Map – Sheet LSZ_007 (1500_COM_LSZ_007_020_20150428)
- Height of Buildings Map – Sheet HOB_007 (1500_COM_HOB_007_020_20150428)
- Heritage Map – Sheet HER_007 (1500_COM_HER_007_020_20150428)
- Environmental Constraint Map – Sheet ECM_007 (1500_COM_ECM_007_020_20150428)
- Lot Size for Dual Occupancy Development Map – Sheet LSD_007 (1500_COM_LSD_007_020_20150428);

Part 5 - Community Consultation

It is recommended that the Planning Proposal be publicly exhibited for a period of 28 days subject to the requirements of a future Gateway Determination. A notification will be placed in the local newspaper and the exhibition material available at:

- Campbelltown Customer Service Centre
- Council's Libraries, (Hard Copy); and
- Council website for the length of the exhibition period (Electronic Copy).

During the exhibition period, any landowners who will be affected by the proposed amendments will be notified of the exhibition of the draft planning proposal. At the conclusion of the exhibition period, a report will be submitted back to Council detailing the submissions received.

Part 6 – Project Timeline

Anticipated commencement date (date of Gateway determination)	**May 2016**
Anticipated timeframe for the completion of required technical information	**May 2016**
Timeframe for government agency consultation (pre and post exhibition as required by Gateway determination)	**No separate government agency consultation proposed – incorporate into public exhibition period**
Commencement and completion dates for public exhibition period	**May 2016 – June 2016**
Timeframe for consideration of submissions	**June 2016**

Date of submission to the department to finalise the LEP	**August 2016**
Anticipated date RPA will make the plan (if delegated)	**August 2016**
Anticipated date RPA will forward to the department for notification	**August 2016**

Schedule of Attachments

Attachment A - **Re-alignment of LGA boundaries**

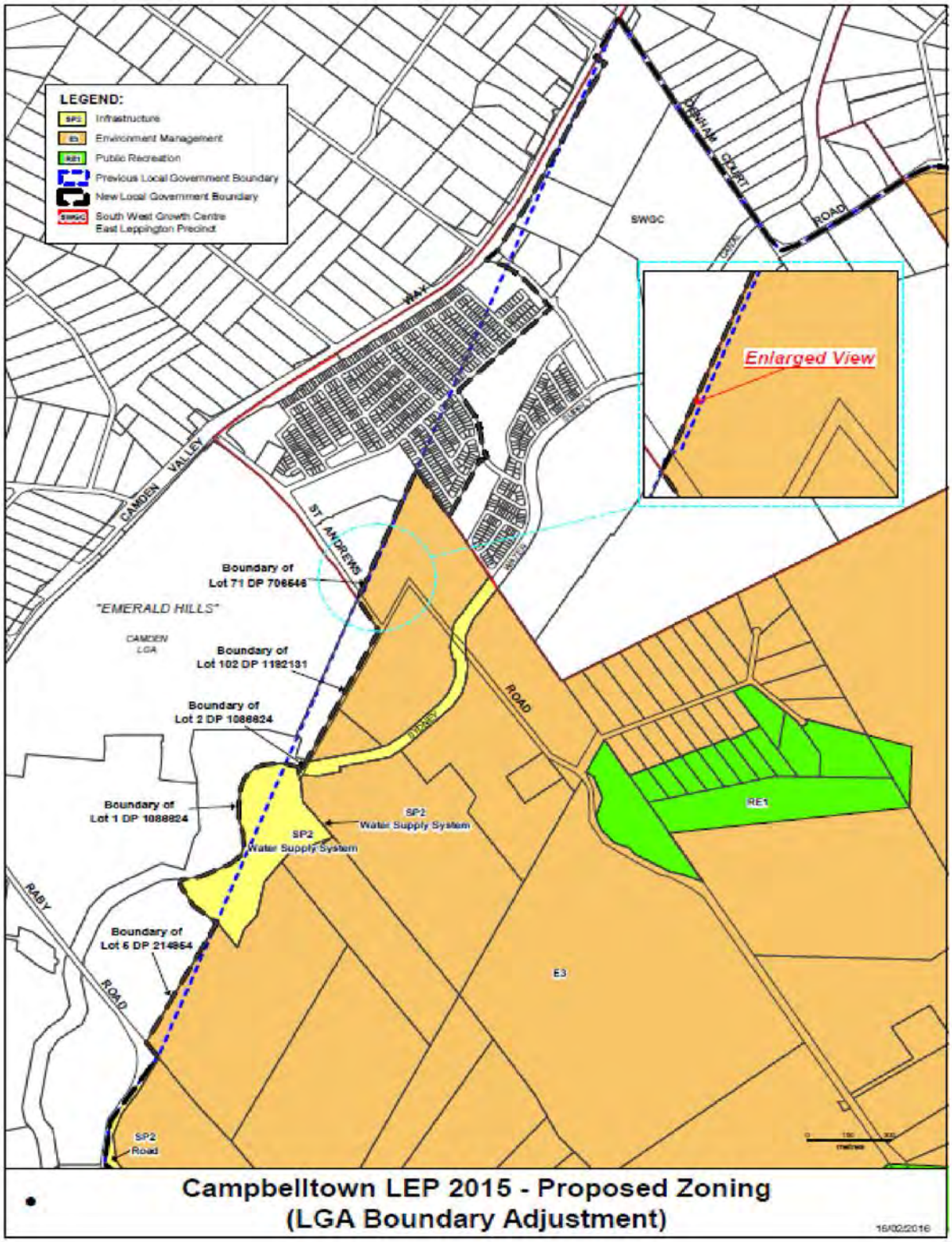
Attachment B - **Copy of Government Gazette dated 27 November 2015**

Attachment C - **Existing Campbelltown LEP 2015 maps prior to re-alignment of LGA boundaries**

Attachment D - **Proposed Campbelltown LEP 2015 maps post to re-alignment of LGA boundaries**

Attachment A

Re-alignment of LGA boundaries



Attachment B

Copy of Government Gazette dated 27 November 2015

Government Gazette

of the State of

New South Wales

Number 106

Friday, 27 November 2015

The *New South Wales Government Gazette* is the permanent public record of official notices issued by the New South Wales Government. It also contains local council and other notices and private advertisements.

The Gazette is compiled by the Parliamentary Counsel's Office and published on the NSW legislation website (www.legislation.nsw.gov.au) under the authority of the NSW Government. The website contains a permanent archive of past Gazettes.

To submit a notice for gazettal – see Gazette Information.

PARLIAMENT

ACT OF PARLIAMENT ASSENTED TO

Legislative Council Office Sydney 19 November 2015

It is hereby notified, for general information, that His Excellency the Governor has, in the name and on behalf of Her Majesty, this day assented to the undermentioned Act passed by the Legislative Council and Legislative Assembly of New South Wales in Parliament assembled, viz.:

Act No. 55, 2015 — An Act to amend the *Retail Trading Act 2008* to make further provision with respect to restricted trading days and bank trading days; and for other purposes. **[Retail Trading Amendment Bill 2015]**

DAVID BLUNT
Clerk of the Parliaments

ACTS OF PARLIAMENT ASSENTED TO

Legislative Assembly Office, Sydney 19 November 2015

It is hereby notified, for general information, that His Excellency the Governor, has, in the name and on behalf of Her Majesty, this day assented to the under mentioned Acts passed by the Legislative Assembly and Legislative Council of New South Wales in Parliament assembled, viz.:

Act No. 56 — An Act to amend the *Gaming and Liquor Administration Act 2007* to make further provision with respect to the administration of the gaming and liquor legislation and the review of certain decisions made under that legislation. **[Gaming and Liquor Administration Amendment Bill]**

Act No. 57 — An Act to constitute and confer functions on the Greater Sydney Commission and to provide for the constitution of planning panels for the Greater Sydney Region; to amend the *Environmental Planning and Assessment Act 1979* to make provision in relation to strategic planning; and for other purposes. **[Greater Sydney Commission Bill]**

RONDA MILLER
Clerk of the Legislative Assembly

GOVERNMENT NOTICES

Miscellaneous Instruments

LOCAL GOVERNMENT ACT 1993

PROCLAMATION

DAVID HURLEY, Governor

I, His Excellency General The Honourable David Hurley AC DSC (Ret'd), Governor of New South Wales, with the advice of the Executive Council, and in pursuance of section 218B of the *Local Government Act 1993*, hereby alter the boundaries of the Area of Campbelltown City as described in the first schedule of the Local Government (Areas) Act No 30, 1948, and the Area of Camden as described by Proclamation in *Government Gazette* No 52 of 27 May 2011, by transferring part of the Area of Campbelltown City described in Schedule A hereto and adding it to the Area of Camden and by transferring part of the Area of Camden described in Schedule B hereto and adding it to the Area of Campbelltown City so that the boundary of the Area of Campbelltown City and the boundary of the Area of Camden shall be as described in Schedules C and D hereto. I also make provision in Schedule E for the apportionment or rates and charges between the affected Councils.

Signed and sealed at Sydney, this 18 day of November 2015.

By His Excellency's Command,

PAUL TOOLE, MP
Minister for Local Government

GOD SAVE THE QUEEN!

Schedule A:
Areas to be transferred from Campbelltown to Camden

Area about 19.24 square kilometres: Being part of Lot 2 DP 1086624, part of Lot 10 DP 1173819, part Lots 2211 – 2213, 2220 – 2222, Lots 2197- 2210 & 2223 – 2236 DP 1193713, part Lots 2176, 2176, 2180, 2181, 2182, Lots 2158 – 2175 & 2183 – 2196 DP 1193712, part Lot 2143, Lots 2125 – 2142 & 2144 – 2157 DP 1193711, part Lots 2003 – 2007, Lots 2001, 2002 DP 1193708, part Lot 1168 DP 1189793, part Lots 1127, 1128, 1165 – 1167, DP 1189792, Lots 1122 – 1126, 1086 – 1088 and part Lots 1120, 1121, 1089 DP 1189791, Lots 1065 – 1068, 1079 – 1085 and part Lots 1077, 1078, 1064 DP 1189790, Lots 1001 – 1020, 1024 – 1030 and part Lots 1000 1031, DP 1189789, Lots 21 – 23 DP 1202611, Lots 691 – 696 DP 1196950, part Lot 43 DP 1174145 and part of the following roads, Moriarty St, Baden Powell Ave, Jamboree Ave, Cub St, Patrol St, Resolution Ave, Scout St, Joey Cr, Willowdale Drive, Penstock St and Canal Pde

Schedule B:
Areas to be transferred from Camden to Campbelltown

Area about 8.63 square kilometres: Being part of Lot 5 DP 214954, part of Lot 1 DP 1086624, part Lot 999 DP 1189789, part Lot 7 DP 1200698.

Schedule C:
Campbelltown Council (as altered)

Area about 301.17 square kilometres. Commencing at the point where Williams Creek meets the southern boundary of Portion 168, Parish of Holsworthy, County of Cumberland, by that creek upwards to the north-eastern boundary of Portion 20, Parish of Eckersley, by part of that boundary south-westerly to the western side of the Old Illawarra Road, by that road generally south-easterly to the north-western corner of Portion 41, by the northern and eastern boundaries of that portion, easterly and southerly, by the eastern boundary of Portion 22, southerly to the centre of the Woronora River, by that river upwards to the northern boundary of Lot 1 DP 1041061, by the northern boundary of that lot and the northern and part of the western boundary of Lot 3 DP 1041061, westerly and southerly to Dahlia Creek, by that creek and O'Hares Creek downwards to the easterly prolongation of the southern boundary of Portion 47, Parish of Wedderburn, by that prolongation westerly and by the southern boundaries of Portions 47 and 13, westerly and by the westerly prolongation of the southern boundary of Portion 13 to the right bank of the Nepean River, by that bank generally northerly to the plan of the Boundary between the Municipalities of Nepean and Campbelltown catalogued Ms 3353 Sy, by that plan generally north-easterly to the south western boundary of Lot 5 DP 214954, by that boundary generally northerly to the south western boundary of Lot 1 DP 1086624, by that boundary generally northerly and by the generally eastern boundary of Lot 2 DP 1086624, northerly to Lot 10 DP 1173819, by that boundary again generally northerly to the south western prolongation of the generally north western boundary of Lot 71 DP 706546, by that prolongation and boundary generally north easterly and south easterly to the south eastern corner of Lot 2236 DP 1193713, by the south eastern boundary of that lot and the south eastern boundary of Canal Parade, and its prolongation generally north easterly to the eastern boundary of Baden Powell Ave, by that boundary, northerly to Jamboree Ave, by the south eastern boundary of that road generally north easterly to the south eastern prolongation of the generally western boundary of Willowdale Drive, by that prolongation and the western boundary of Willowdale Drive, generally north westerly to the north-eastern most corner of Lot 1000 DP 1189789, by a line, generally north easterly to the north west corner of Lot 999 DP 1189789, by the north western boundary of that lot and Lot 7 DP 1200698, generally north easterly to Camden Valley Way, by Camden Valley Way generally northerly to Denham Court Road, by that road, generally south-easterly, Campbelltown Road generally north-easterly, the road on the southwest of

Lot 5 DP 241558, Lots 2 and 3 DP 507628, Lots 4, 5, 6, 7 and 8 DP 13684, and Lots 1, 2 and 3 DP 215195, south-easterly and Glenfield Road easterly and south-easterly to the Main Southern Railway, by that railway north-easterly to the southern boundary of Portion 68, Parish of Minto; by that boundary easterly to the left bank of Georges River; by that bank upwards to the western prolongation of the northern boundary of Portion 1, Parish of Eckersley; by that prolongation, boundary and eastern prolongation of that boundary generally easterly, part of the western, the northern and part of the eastern boundaries of Portion 17 northerly, easterly and southerly, the northern boundaries of Portions 6, 2, 48, easterly to the point of commencement.

Schedule D:
Camden Council (as altered)

Area about 218.59 square kilometres. Commencing at the junction of the left bank of the Nepean River with the right bank of Sickles Creek, and bounded thence by that bank upwards to the north most northern boundary of Lot 332 DP 861656; by part of that boundary westerly, the generally south-eastern and part of the southern boundaries of Lot 1 DP 547322 generally south-westerly and westerly, the generally eastern boundary of Lot 1 DP 235460 generally southerly, part of the eastern boundary of Lot 102 DP 701950 southerly, the north-eastern boundary of Lot 41, plan catalogued 1570 (L) south-easterly to the middle of the road catalogued R. 440-1603; by a line along the middle of that road south-westerly to its intersection with the northerly prolongation of a line along the middle of the road forming the western boundary of lots 39 and 35 of the said plan catalogued 1570 (L); by a line along the middle of that road southerly to the middle of the road catalogued R. 441-1,603; by a line along the middle of that road south-easterly and easterly to the middle of the road catalogued R. 6452-1603 R.; by a line along the middle of that road northerly to its intersection with the westerly prolongation of a line along the middle of Cawdor-lane; by a line along the middle of that lane easterly to the middle of the road catalogued R. 442-1603; by a line along the middle of that road distant 3 chains 66 links southerly; by a line east to the left bank of Navigation Creek; by that bank of that creek generally northerly to the left bank of the Nepean River; by a line north to the right bank of that river; by that bank of the Nepean River generally easterly to the plan of the Boundary between the Municipalities of Nepean and Campbelltown catalogued Ms 3353 Sy; by that plan generally north-easterly to the south western boundary of Lot 5 DP 214954, by that boundary generally northerly to the south western boundary of Lot 1 DP 1086624, by that boundary generally northerly and by the generally eastern boundary of Lot 2 DP 1086624, northerly to Lot 10 DP 1173819, by that boundary again generally northerly to the south western prolongation of the generally north western boundary of Lot 71 DP 706546, by that prolongation and boundary generally north easterly and south easterly to the south eastern corner of Lot 2236 DP 1193713, by the south eastern boundary of that lot and the south eastern boundary of Canal Parade, and its prolongation generally north easterly to the eastern boundary of Baden Powell Ave, by that boundary, northerly to Jamboree Ave, by the south eastern boundary of that road generally north easterly to the south eastern prolongation of the generally western boundary of Willowdale Drive, by that prolongation and the western boundary of Willowdale Drive, generally north westerly to the north-eastern most corner of Lot 1000 DP 1189789, by a line, generally north easterly to the north west corner of Lot 999 DP 1189789, by the north western boundary of that lot and Lot 7 DP 1200698, generally north easterly to Camden Valley Way, by Camden Valley Way and Cowpasture Road, northerly, Bringelly Road and Greendale Road westerly to the eastern boundary of Portion 14, Parish of Bringelly; by part of that boundary and the southern boundary of that portion southerly and westerly to Bringelly Creek; by that creek downwards to the north eastern prolongation of the generally eastern boundary of Lot 4 DP 776502, by that prolongation and the generally eastern boundary of Lot 4 DP 776502 aforesaid, southerly, the eastern and southern boundaries of Lot 5 DP 776502, southerly and westerly, to the Bringelly Creek aforesaid; by that creek downwards to the eastern prolongation of the northern boundary of Lot 7 DP 1056890, by that prolongation and the generally northern, eastern and southern boundaries of Lot 7 DP 1056890 aforesaid, generally easterly, southerly and westerly to the Bringelly Creek aforesaid, by that creek downwards to the southern prolongation of the eastern boundary of Lot 6 DP 1056890, by that prolongation and the eastern, southern, and western boundaries of Lot 6 DP 1056890 aforesaid, generally southerly, northerly and easterly to the Bringelly Creek aforesaid; by that creek downwards to the southern prolongation of the eastern boundary of Lot 2 DP 582023, by that prolongation and the south-eastern boundary of Lot 2 DP 582023 aforesaid, south-westerly to the north eastern prolongation of the south eastern boundary of Lot 2 DP 582023 aforesaid; by that prolongation to the Nepean River upwards to south-eastern corner of Portion 29, Parish of Cook and by a line southerly to the point of commencement.

Schedule E:
Rates and Charges

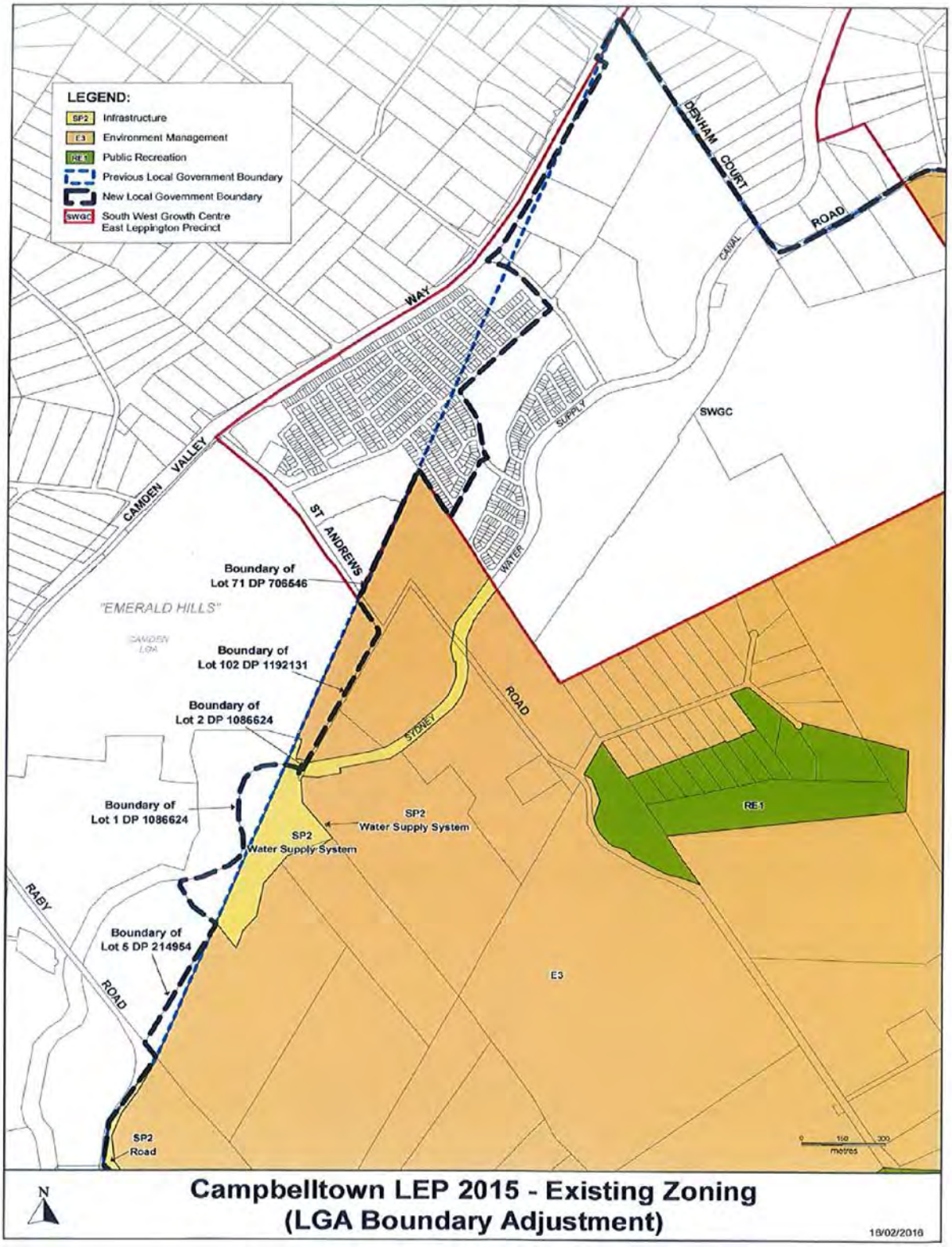
1) Appropriate arrangements are to be made in relation to the rates and charges over the rateable parcels of land affected by this Proclamation.

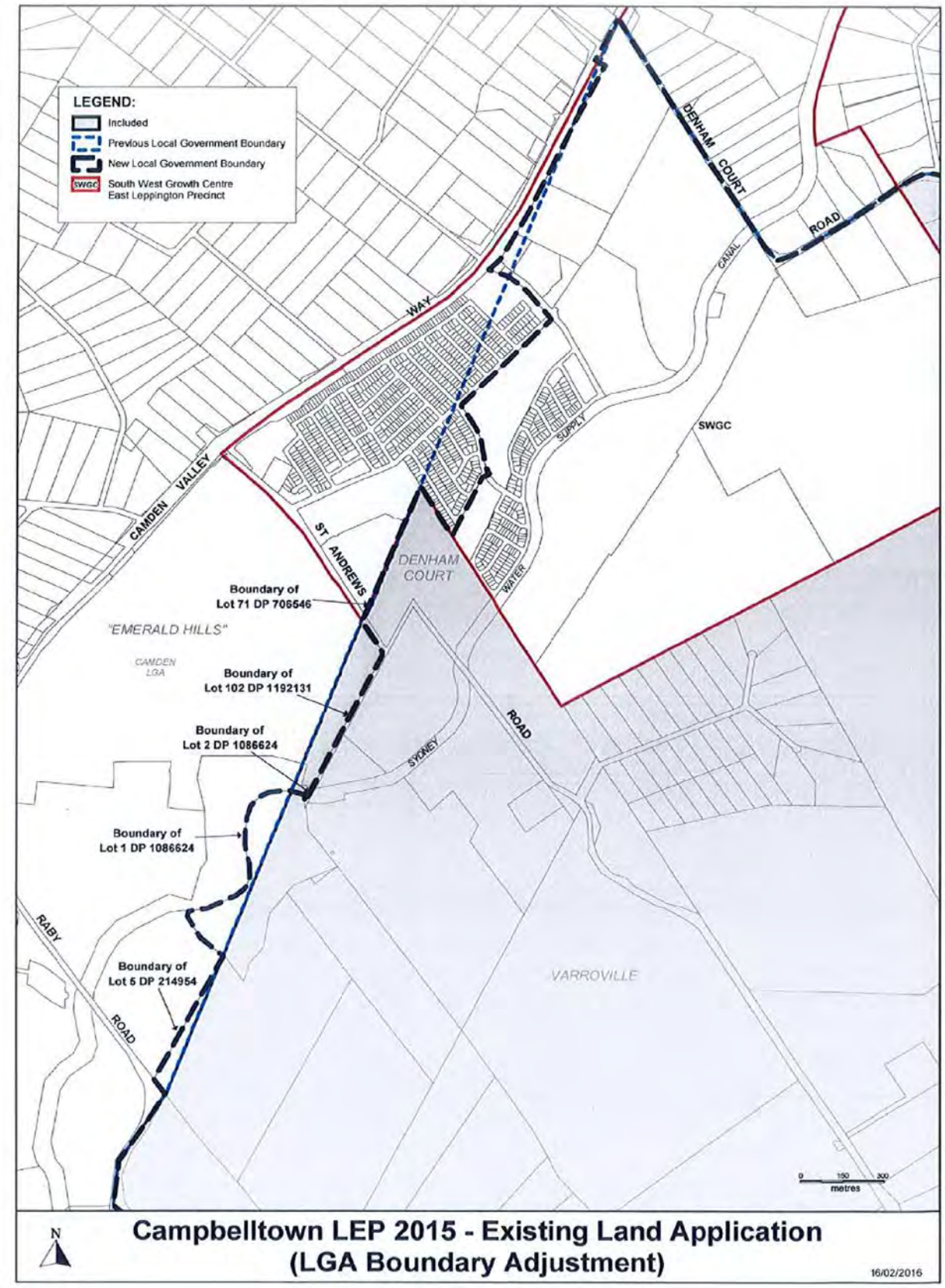
2) The General Manager of Campbelltown City and the General Manager of Camden are to reach a negotiated agreement on the nature of those arrangements.

3) In the event that the General Managers of Campbelltown City and Camden cannot come to a negotiated agreement on the matter of rates and charges, the Minister for Local Government will make a determination on that matter.

Attachment C

Existing Campbelltown LEP 2015 maps prior to re-alignment of LGA boundaries

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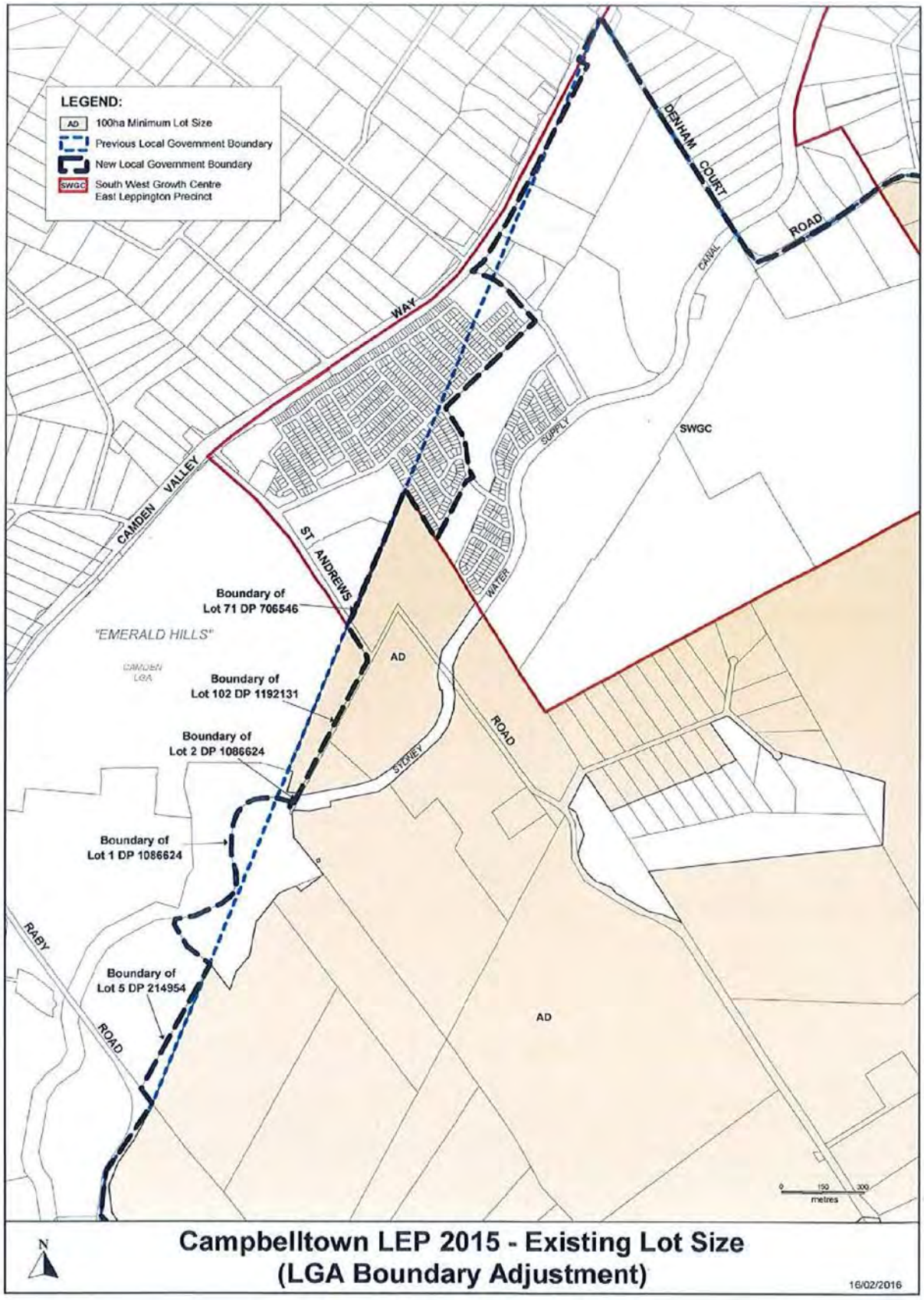
New Local Government Boundary
South West Growth Centre
East Leppington Precinct
DENHAM COURT ROAD
CAMDEN VALLEY WAY
ST ANDREWS
DENHAM COURT
SUPPLY
WATER
CANAL
SWGC
"EMERALD HILLS"
CAMDEN LGA
Boundary of Lot 71 DP 706546
Boundary of Lot 102 DP 1192131
Boundary of Lot 2 DP 1086624
Boundary of Lot 1 DP 1086624
Boundary of Lot 5 DP 214954
SYDNEY ROAD
RABY ROAD
VARROVILLE
0 150 300
metres
N
Campbelltown LEP 2015 - Existing Land Application
(LGA Boundary Adjustment)
16/02/2016


LEGEND:
AD 100ha Minimum Lot Size
Previous Local Government Boundary
New Local Government Boundary
SWGC South West Growth Centre East Leppington Precinct
DENHAM COURT ROAD
CANAL
WAY
SUPPLY
SWGC
CAMDEN VALLEY
ST ANDREWS
WATER
Boundary of Lot 71 DP 706546
"EMERALD HILLS"
CAMDEN LGA
AD
Boundary of Lot 102 DP 1192131
Boundary of Lot 2 DP 1086624
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Boundary of Lot 1 DP 1086624
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Boundary of Lot 5 DP 214954
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metres
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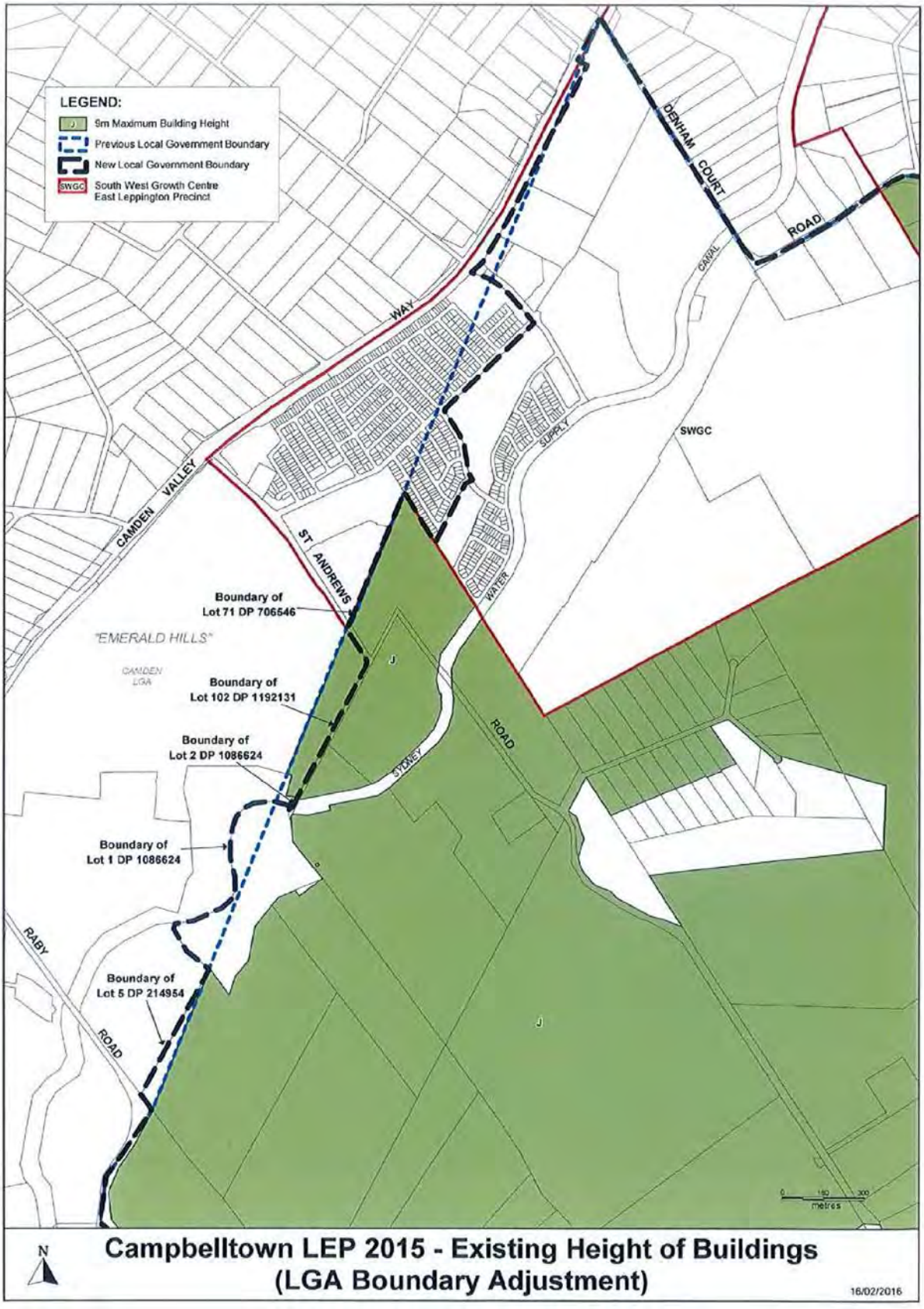
Campbelltown LEP 2015 - Existing Lot Size
(LGA Boundary Adjustment)
16/02/2016


LEGEND:
9m Maximum Building Height
Previous Local Government Boundary
New Local Government Boundary
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South West Growth Centre
East Leppington Precinct
DENHAM COURT
ROAD
CANAL
WAY
SUPPLY
SWGC
CAMDEN VALLEY
ST ANDREWS
WATER
Boundary of
Lot 71 DP 706546
"EMERALD HILLS"
CAMDEN LGA
Boundary of
Lot 102 DP 1192131
Boundary of
Lot 2 DP 1086624
ROAD
SYDNEY
Boundary of
Lot 1 DP 1086624
RABY
Boundary of
Lot 5 DP 214954
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metres
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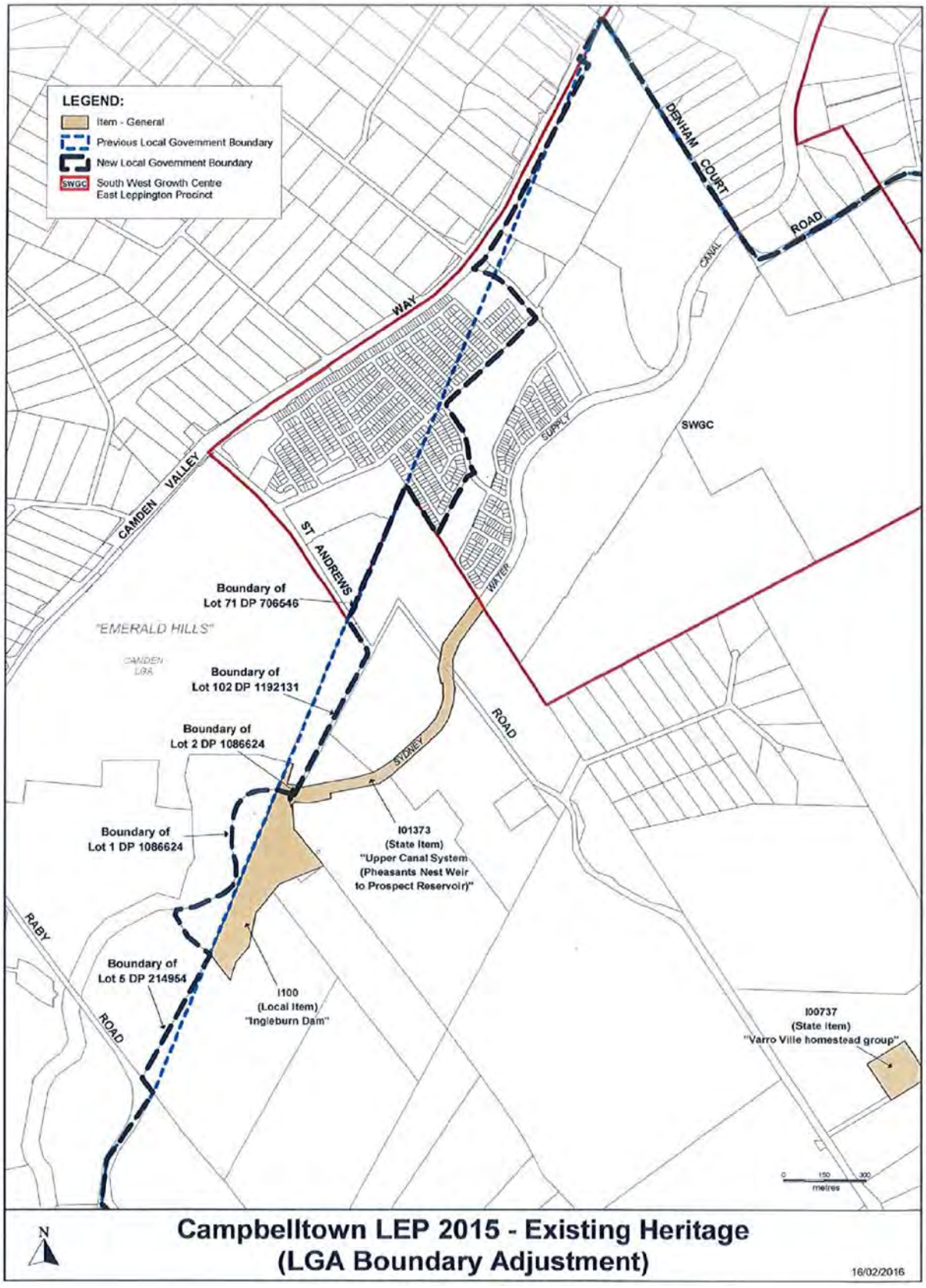
Campbelltown LEP 2015 - Existing Height of Buildings
(LGA Boundary Adjustment)
16/02/2016


LEGEND:
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New Local Government Boundary
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South West Growth Centre
East Leppington Precinct
DENHAM COURT
ROAD
CANAL
WAY
SWGC
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Boundary of
Lot 2 DP 1086624
SYDNEY
ROAD
Boundary of
Lot 1 DP 1086624
I01373
(State Item)
"Upper Canal System
(Pheasants Nest Weir
to Prospect Reservoir)"
RABY
ROAD
Boundary of
Lot 5 DP 214954
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(Local Item)
"Ingleburn Dam"
I00737
(State Item)
"Varro Ville homestead group"
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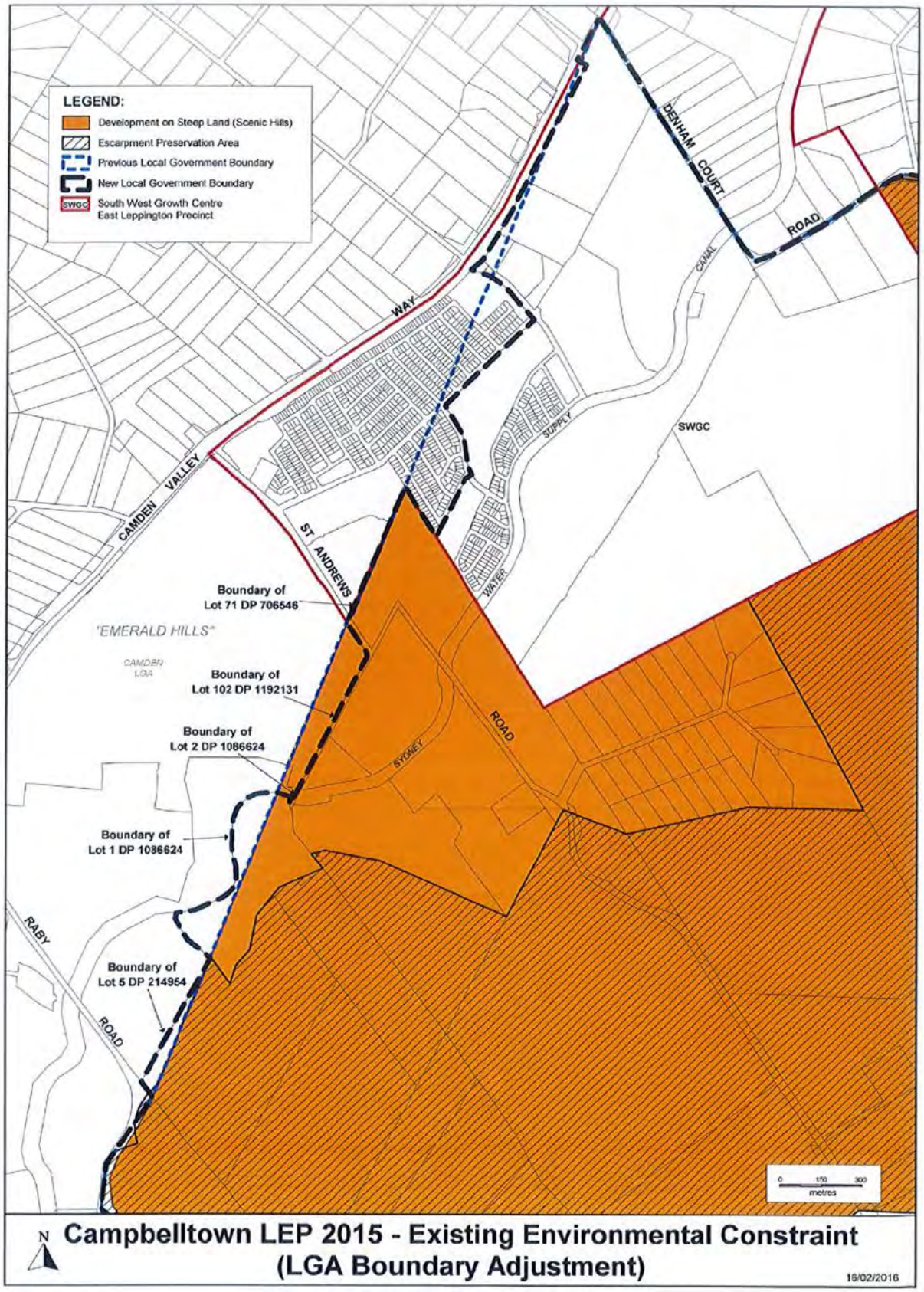
metres
N
Campbelltown LEP 2015 - Existing Heritage
(LGA Boundary Adjustment)
16/02/2016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Development on Steep Land (Scenic Hills)
Escarpment Preservation Area
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South West Growth Centre
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RABY
ROAD
Boundary of
Lot 5 DP 214954
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metres
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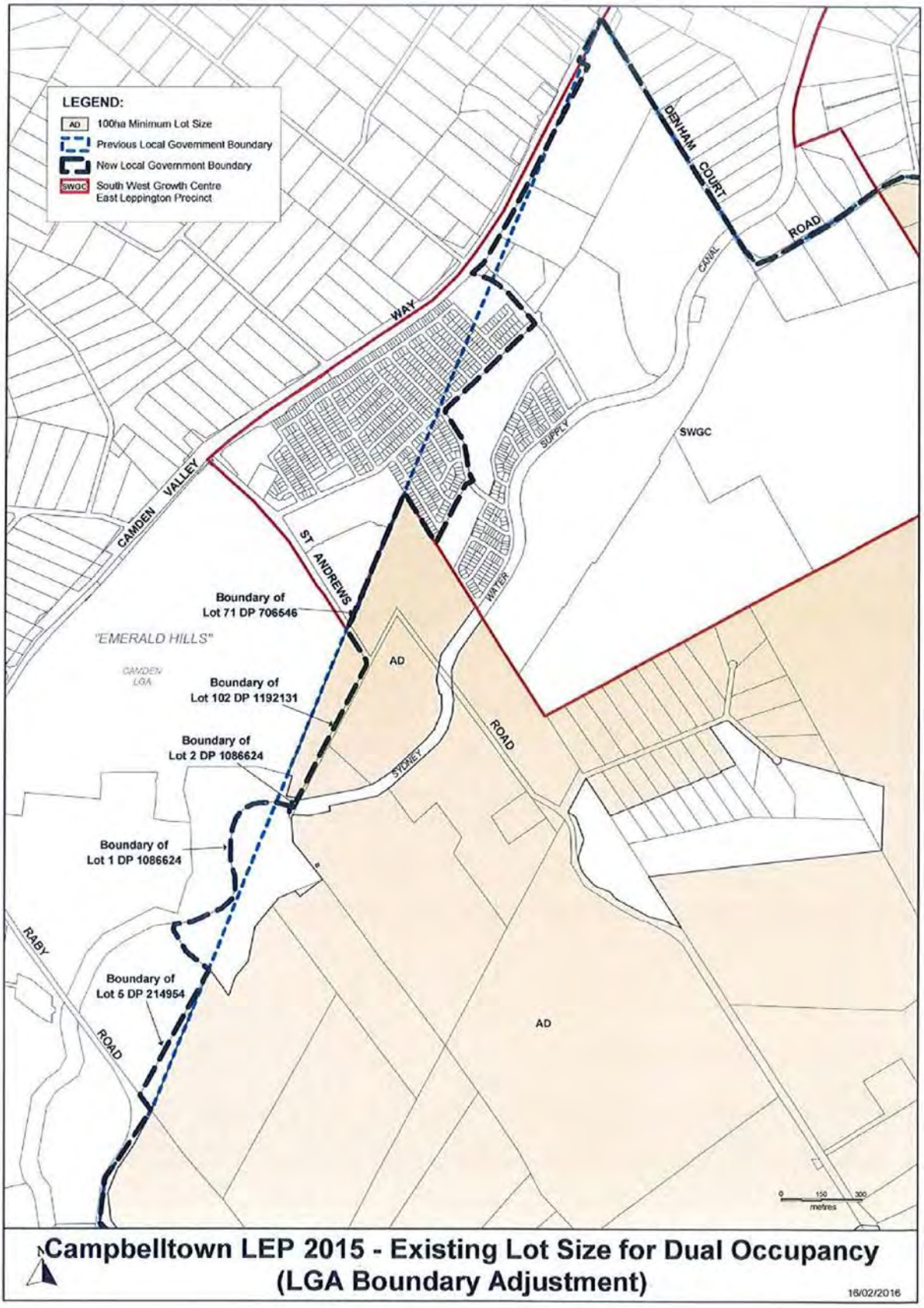
(LGA Boundary Adjustment)
16/02/2016


LEGEND:
AD 100ha Minimum Lot Size
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Boundary of Lot 5 DP 214954
ROAD
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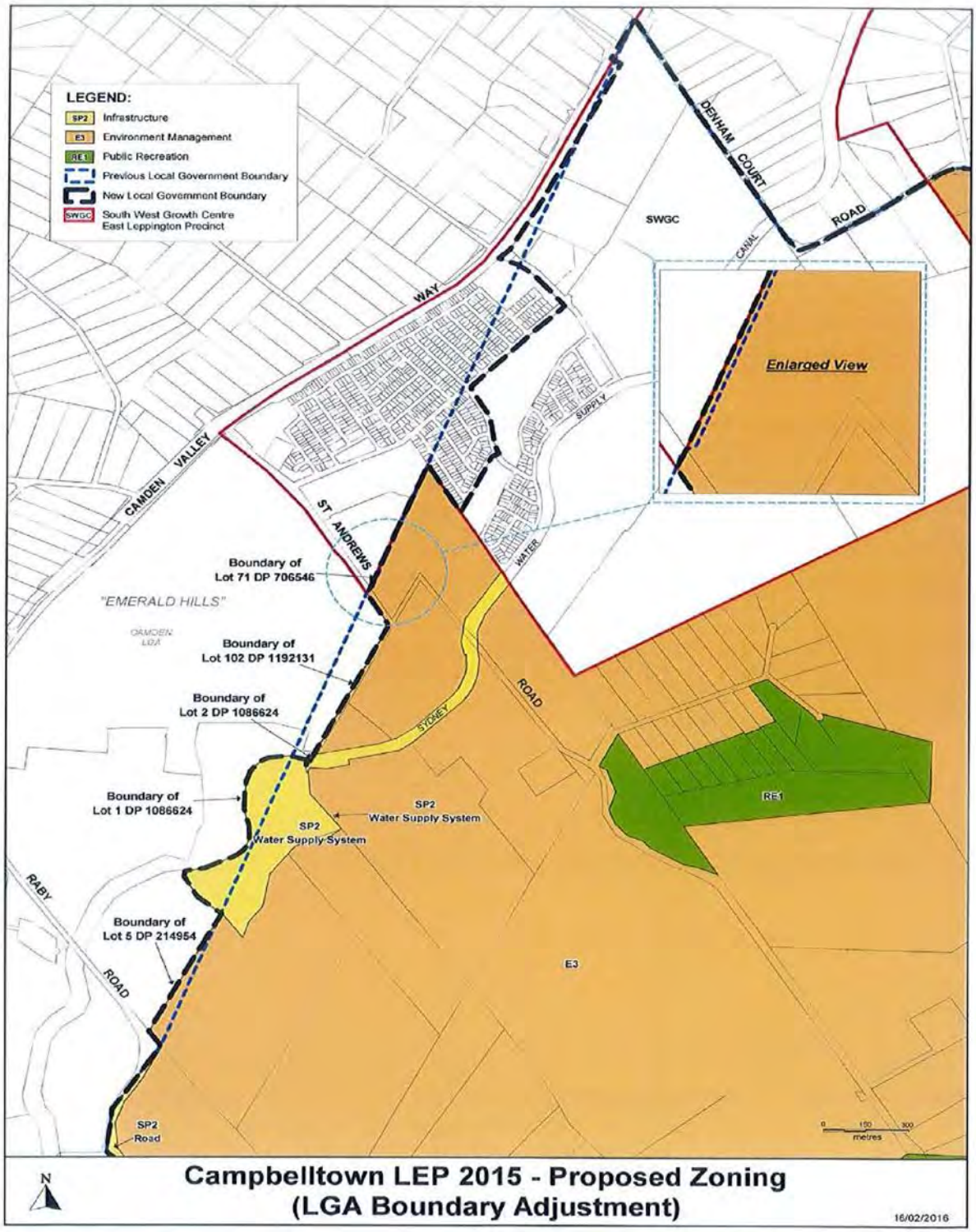
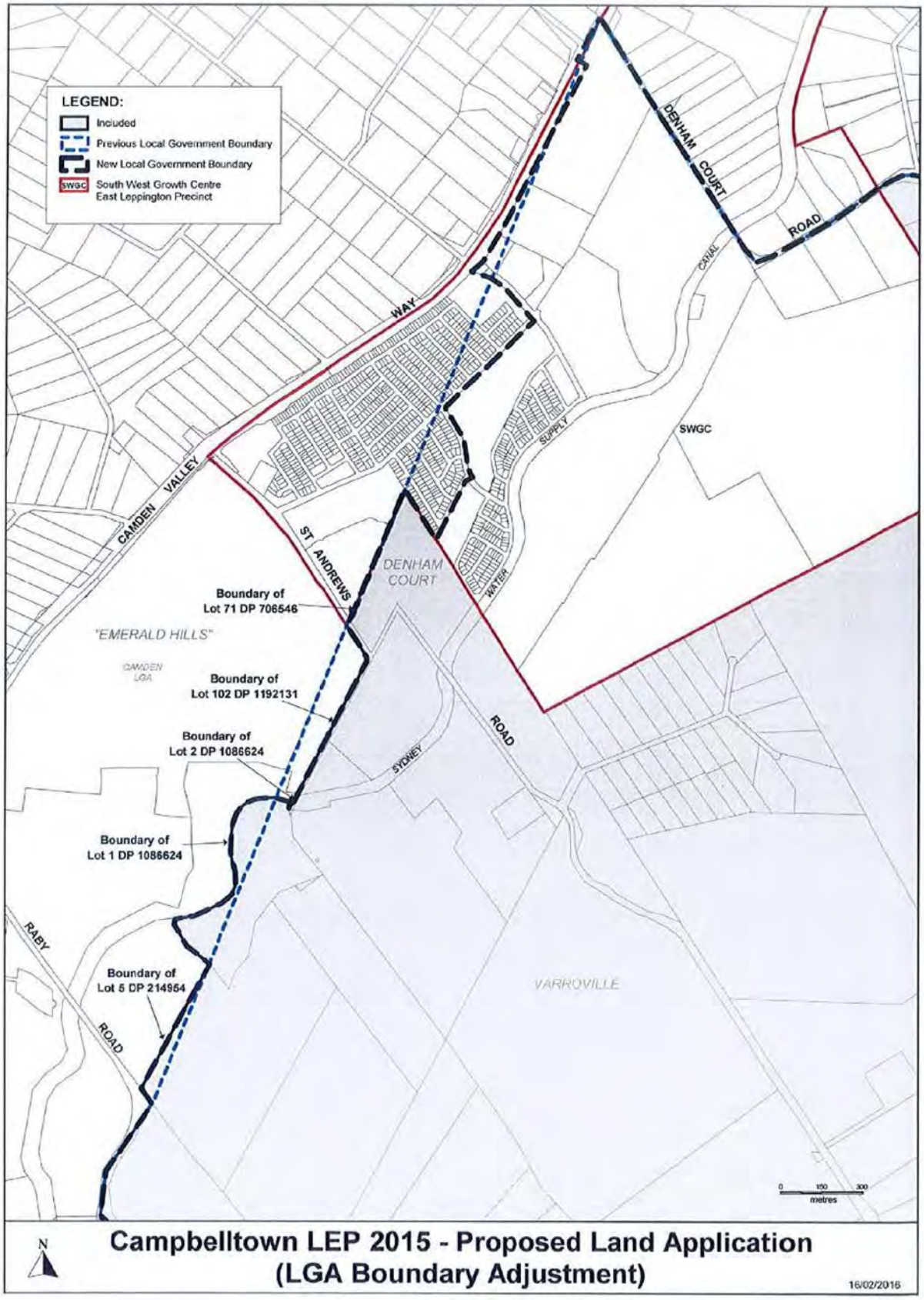
0 150 300
metres
Campbelltown LEP 2015 - Existing Lot Size for Dual Occupancy
(LGA Boundary Adjustment)
16/02/2016

Attachment D

Proposed Campbelltown LEP 2015 maps post to re-alignment of LGA boundaries




LEGEND:
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New Local Government Boundary
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DENHAM COURT ROAD
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CAMDEN VALLEY
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metres
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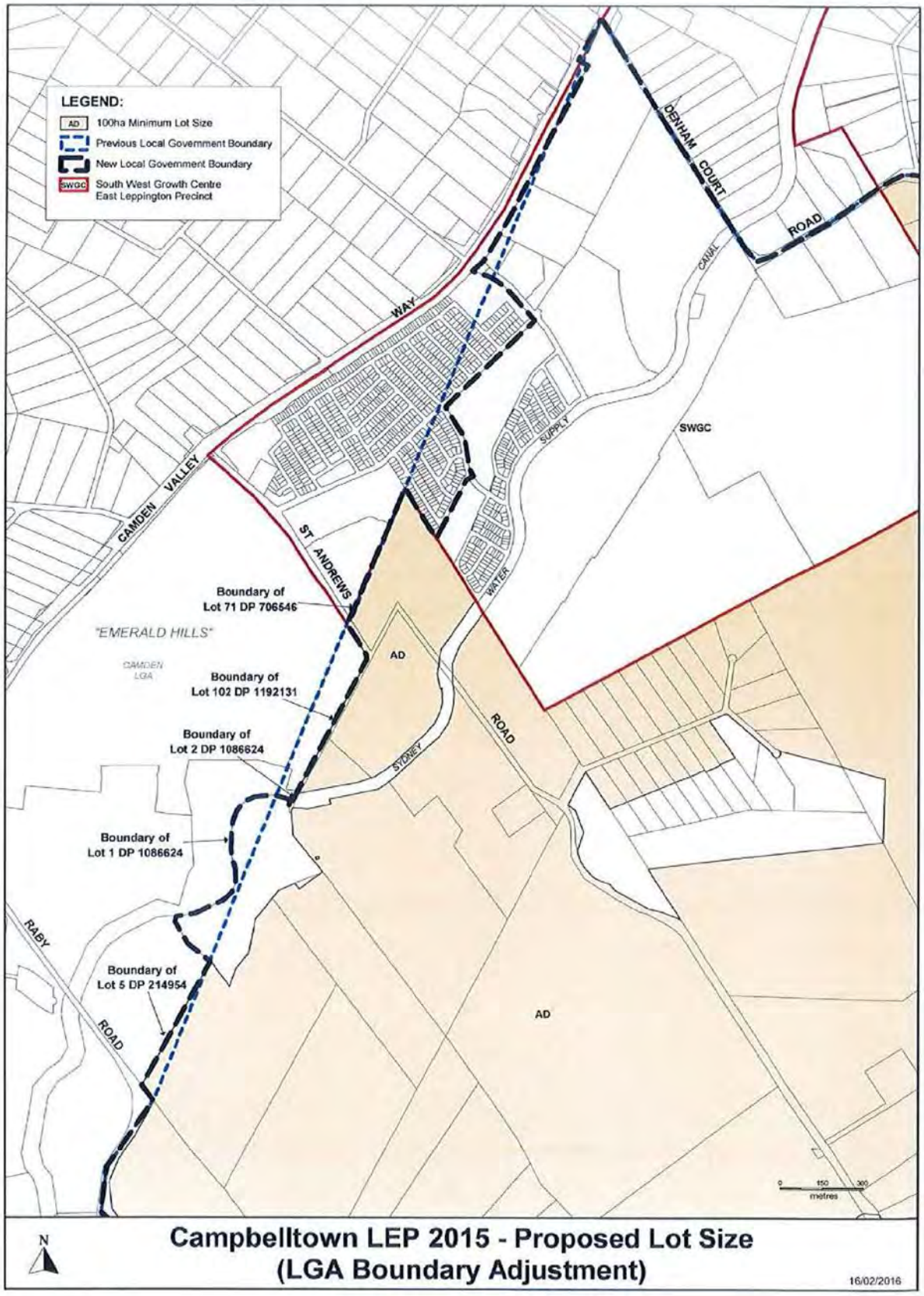
Campbelltown LEP 2015 - Proposed Land Application
(LGA Boundary Adjustment)
16/02/2016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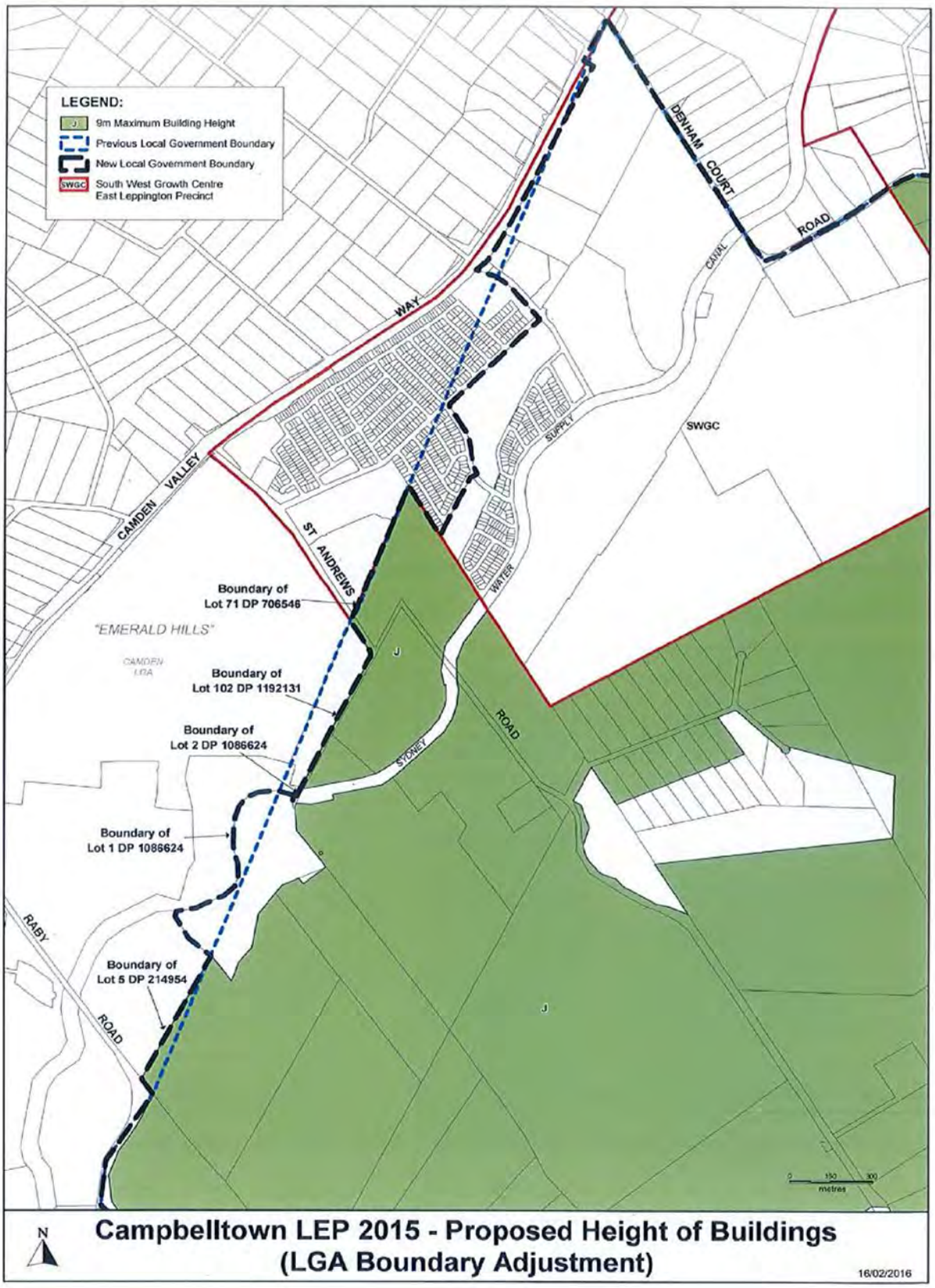
(LGA Boundary Adjustment)
16/02/2016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metres
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Campbelltown LEP 2015 - Proposed Height of Buildings
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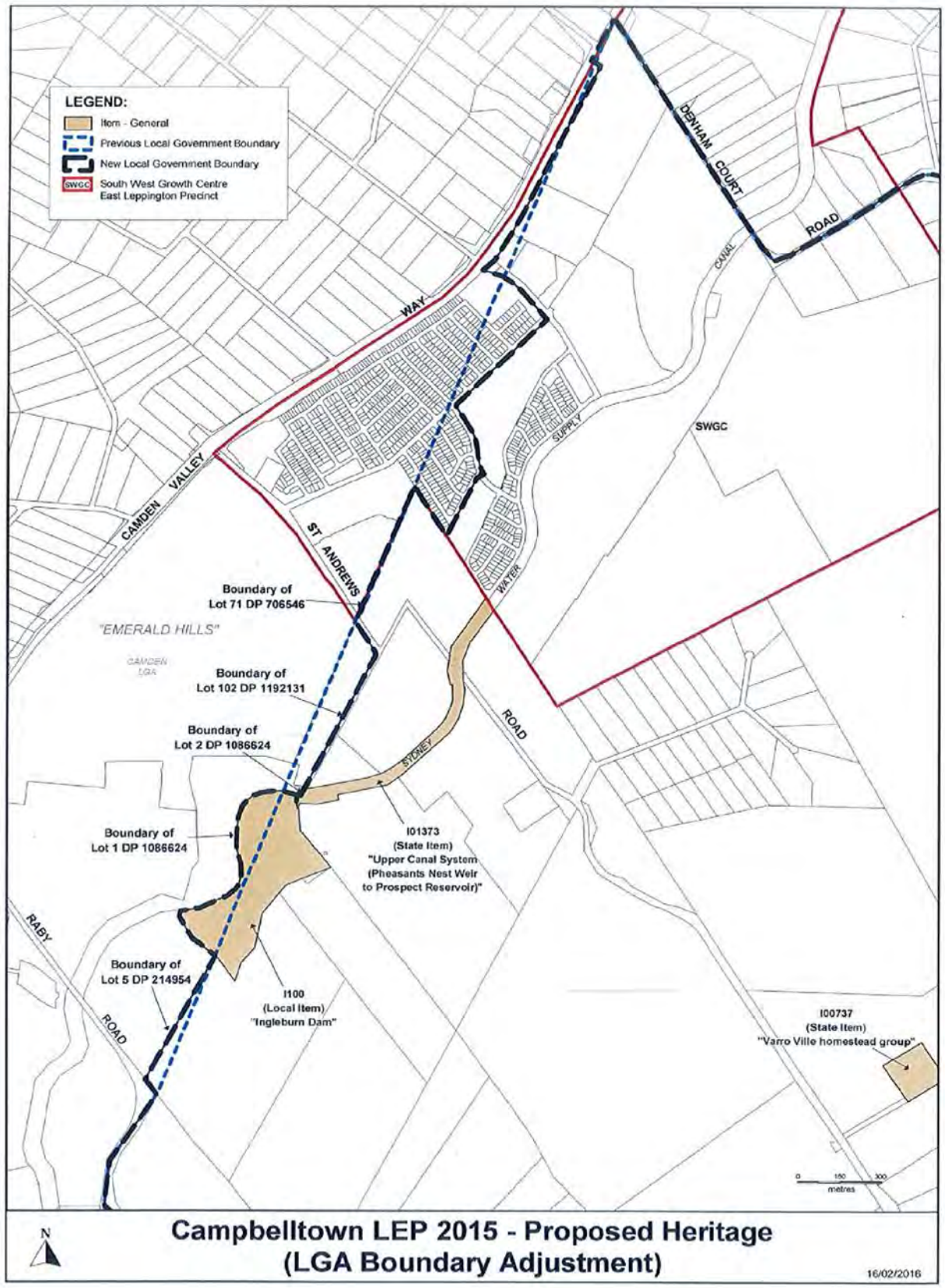
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WAY
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(State Item)
"Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)"
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Boundary of Lot 5 DP 214954
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"Ingleburn Dam"
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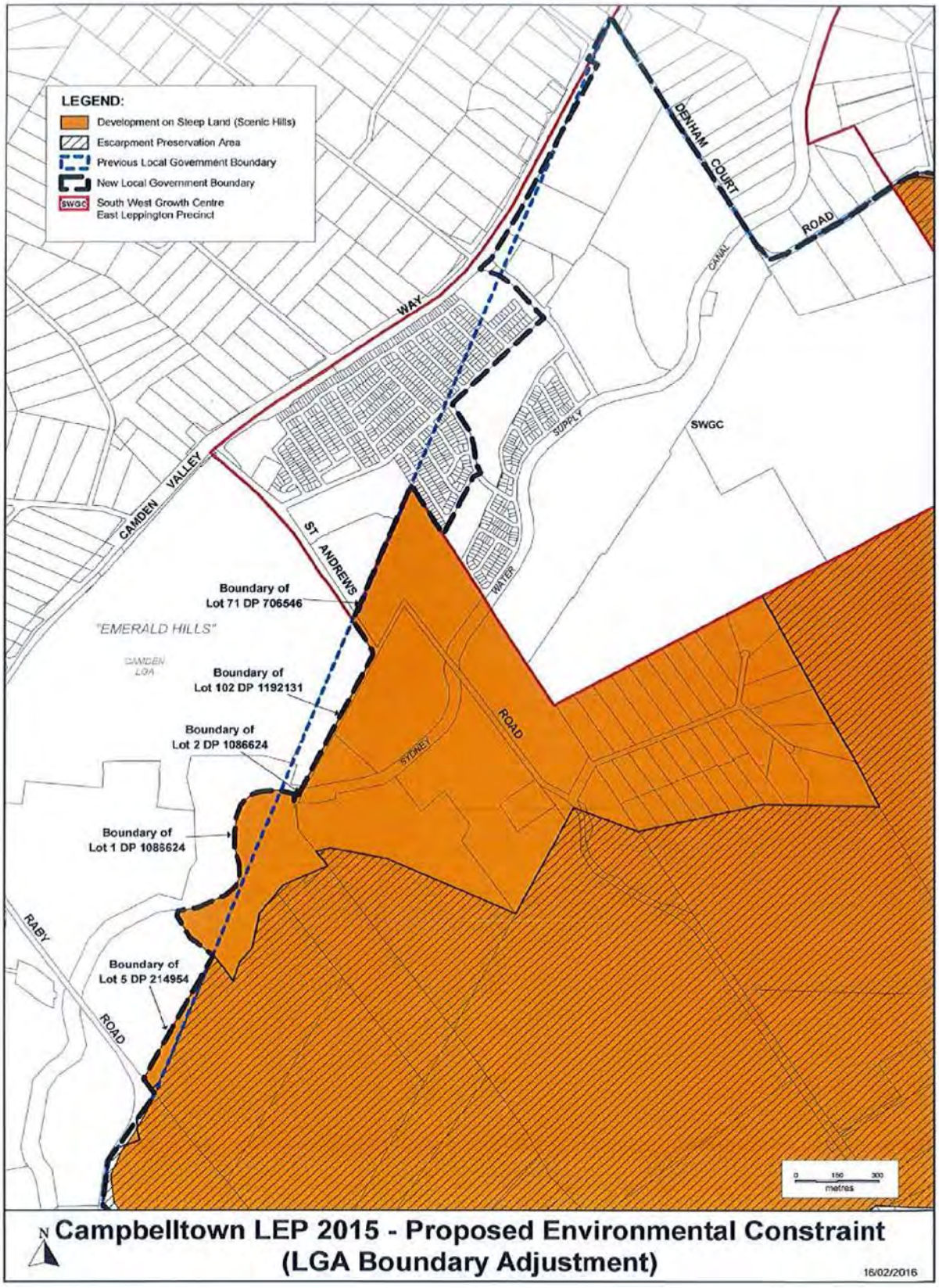
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RABY
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Campbelltown LEP 2015 - Proposed Environmental Constraint
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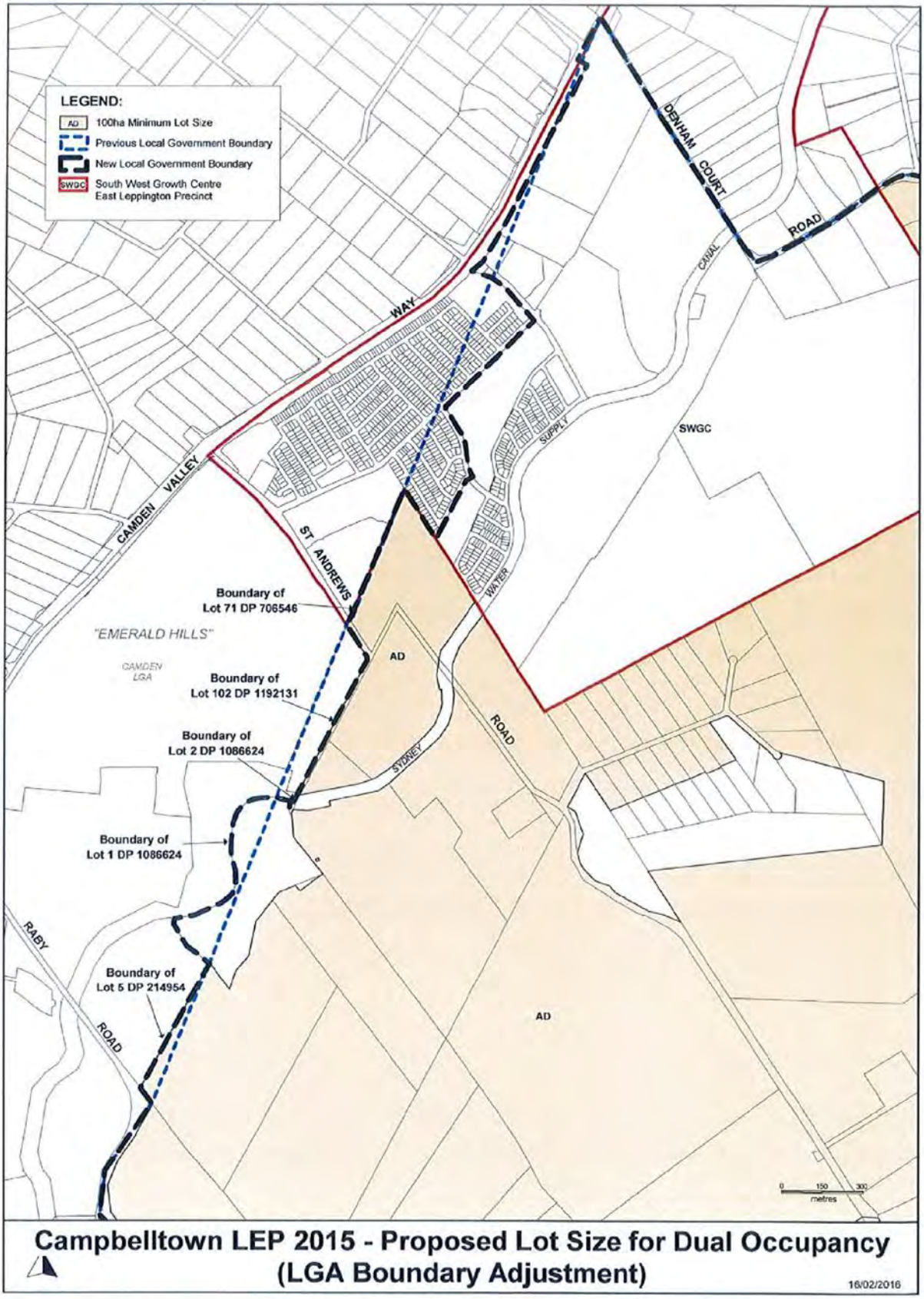
16/02/2016


LEGEND:
AD 100ha Minimum Lot Size
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DENHAM COURT ROAD
CANAL
WAY
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Boundary of Lot 2 DP 1086624
ROAD
SYDNEY
Boundary of Lot 1 DP 1086624
RABY
Boundary of Lot 5 DP 214954
ROAD
AD
0 150 300
metres
Campbelltown LEP 2015 - Proposed Lot Size for Dual Occupancy
(LGA Boundary Adjustment)
16/02/2016

2.4 Planning Proposal - Rezoning of the Glenfield Waste Site

Reporting Officer

Manager Environmental Planning

Attachments

1. Correspondence from the Department of Planning and Environment (contained within this report)
2. Revised draft Planning Proposal and maps (contained within this report) with Technical Studies (distributed under separate cover due to their size of 995 pages)

Purpose

To seek Council's endorsement to place a revised planning proposal and associated technical studies on public exhibition, to primarily enable the Glenfield Waste Site (GWS) at Cambridge Ave, Glenfield to be used for industrial purposes and a private car park to service the industrial uses.

History

In June 2012, Council received a draft rezoning submission report from Environmental Property Services, on behalf of the property owners of the GWS, requesting Council to rezone the site to generally enable industrial development and a car park.

Council on 18 June 2013 considered a report on the draft planning proposal and resolved in part as follows:

> "That Council endorse the draft planning proposal from Environmental Property Services, on behalf of the property owner JC & FW Kennett Pty Ltd for the rezoning of Glenfield waste site to generally enable industrial development as presented by this report and lodge the draft Planning Proposal with the Department of Planning and Infrastructure for determination by the Gateway Panel."

Accordingly, on 6 August 2013 Council received a Gateway Determination from the Department of Planning and Environment (the Department) that supported the proposal subject to a number of conditions. These conditions required additional information to be placed on public exhibition with the planning proposal in relation to flora and fauna, heritage, acoustic (noise impact), stormwater management and flooding and traffic impact (roadwork capacity and infrastructure improvements).

As part of the Gateway Determination Council was also required to update the planning proposal to include sufficient additional information to adequately demonstrate consistency or justify any inconsistency with S117 Directions related to heritage conservation, integrated land use and transport and flood prone land.

In light of the requirements under the Gateway Determination, Council provided the Department with additional information in relation to S117 Directions, and sought variation to one of the Gateway conditions that required the preparation of additional information for stormwater and flooding prior to public exhibition. Notably, Council's engineers are of the opinion that while a detailed stormwater and flood study must be prepared for the site, it may be prepared at a later stage as part of any future subdivision application for the site.

Accordingly, on 9 December 2014 the Department issued a revised Gateway determination a copy of which is shown under Attachment 1. The revised Gateway determination removed the condition requiring additional stormwater and flooding information at this stage, subject to providing an additional access point to the site from Cambridge Avenue, in an area that is not potentially affected by flooding. In addition the Department advised Council that the planning proposal is considered to be consistent with S117 Direction 2.3 Heritage Conservation and suggested that Council include additional information in relation to cycling and pedestrian options to justify consistency with S117 Direction No 3.4 Integrating Land Use Transport.

In accordance with the revised Gateway Conditions, the applicant prepared all the required studies to Council officer's satisfaction. The planning proposal shown under Attachment 2 to this report has been revised and updated to reflect the findings of the technical studies.

A submission to the then draft Campbelltown Local Environmental Plan 2014 (the draft CLEP 2014) was received during the public exhibition period from the NSW Office of Strategic Lands (OSL) in relation to land acquisition matters of the adjacent open space corridor. OSL advised Council via its submission that it would not accept the part of the open space corridor that has been subject to landfill and that which contains monitoring wells for gas and water.

As this planning proposal was already lodged with Council, it was considered appropriate to address the submission to the then draft CLEP 2014 via an amendment to this Planning Proposal to include the existing open space corridor.

In consultation with the OSL, the applicant undertook a survey to ascertain the width of the open space corridor to be acquired by OSL with the remaining corridor land to be zoned for industrial uses. A copy of the survey was submitted to Council in August 2015 and shown as Map 3.12 under Attachment 2 to this Report.

Council in September 2015 revised the planning proposal boundary to include the required open space corridor and additional area to be rezoned for industrial purposes and sought a revised Gateway Determination from the Department.

On 8 February 2016, Council received an 'Alteration of Gateway Determination' which addressed the site boundary and zoning variation and required Council to finalise the proposed amendment to the Campbelltown Local Environmental Plan 2015 (the CLEP) by 15 September 2016. A copy of the 'Alteration to the Gateway Determination' is included under attachment 1 to this report.

A brief overview of the planning proposal was provided to Councillors at the 23 February 2016 briefing evening.

This report seeks Council's endorsement to place the planning proposal and associated technical studies on public exhibition for public comments.

Report

Property Description:	Lot 91 DP 1155962, Lot 1 DP 113201 and Lot 2 DP 333578
Owner:	JC & FW Kennett Pty Ltd
Property Description:	Lot 3 DP 735524 and Lot 3 DP 736881
Owner:	Figela Pty Ltd
Property Description:	Lot 92 DP 1155962
Owner:	Transport for NSW

The Site

The Glenfield waste site comprises two large parcels of land, the northern parcel, located within the Liverpool Local Government Area (LGA) and the southern parcel, located within the Campbelltown LGA. This proposed rezoning application relates only to the southern parcel that is located within the Campbelltown LGA (bisected by Cambridge Avenue).

The site subject to this Planning Proposal is approximately 48 hectares in area and shown as Map 3.1, under Attachment 2 of this report.

The Georges River forms the eastern boundary of the GWS. A strip of open space land separates the subject site from the Georges River, and acts as a buffer between the river and the existing recycling facility.

An electricity easement passes along the site located south of Cambridge Avenue. This area of the site is currently unoccupied open space, used only for grazing horses and acts as a 'buffer' between the recycling facility to the north and the residential areas to the south.

Draft Planning Proposal – Amendment No. 2 to the CLEP

The draft Planning Proposal seeks to rezone an area north of Cambridge Ave to enable industrial development, and rezone an area south of Cambridge Avenue (that is burdened by an electricity easement) for car parking purposes. The area south of Cambridge Ave will be subject to the outcome of consultation with Transgrid, who owns the electricity easement that runs through the southern part of the site.

The proposed rezoning will form the second amendment (Amendment No 2) to the CLEP. The first amendment to the CLEP will be a required administrative amendment resulting from a boundary adjustment and is outlined in a separate report in the March 2016 business paper.

Existing Zoning

The site is currently subject to the following plans:

1. Campbelltown (Urban Area) Local Environmental Plan 2002 (LEP 2002)
2. Campbelltown Local Environmental Plan 2015 (The CLEP)

Most of the land that is subject to this planning proposal is included under the CLEP as a 'Deferred Matter' and as such Campbelltown (Urban Area) Local Environmental Plan 2002 (LEP 2002) is currently the principal planning instrument that applies to these allotments. The deferred areas under the CLEP are currently zoned 1(a) Rural Zone under LEP 2002. The current zoning map under LEP 2002 is shown as Map 3.3 under Attachment 2 of this report.

The railway corridor that passes through the site, the proposed Georges River Parkway, Cambridge Avenue and the strip of open space corridor that runs adjacent to the Georges River have been assigned appropriate zones under the CLEP as shown on the Map 3.4 of Attachment 2. Those areas will retain the current zoning under the CLEP with the exception of part of the open space corridor which is proposed to be reduced in width (from approximately 160 metres to approximately 40 to 70 metres)

Proposed Zoning

The properties owned by JC & FW Kennett Pty Ltd and Figela Pty Ltd, located north of Cambridge Avenue are proposed to be zoned Zone IN1 General Industrial.

The land that is proposed to be acquired by OSL (as mentioned previously in this report) is proposed to retain the current zoning under the CLEP RE1-Public Recreation, while the remaining area of this open space strip is proposed to be rezoned Zone IN1-General Industrial.

The property to the north west owned by Transport for NSW (Lot 92 in DP 1155962) is proposed to be rezoned Zone SP2 (Railway Corridor). This area is currently a deferred matter under the CLEP.

The part of the site south of Cambridge Avenue (Part Lot 3 DP 736881) is proposed to be rezoned Zone SP2 Infrastructure (Car Park). A proposed land zoning map is shown as Map 3.5 under Attachment 2 of this report.

Proposes lot sizes and proposed height of buildings

It is proposed that the future industrial areas be allocated a minimum lot size of 4000sqm, and a maximum building height of 12 meters which are consistent with the minimum lot sizes and building heights for areas currently zoned IN1 General Industrial across the LGA (Ingleburn and Minto industrial areas).

Gateway Determination – December 2014

On 9 December 2014 the Department issued a revised Gateway determination, a copy of which is shown under Attachment 1.

The Gateway Determination required Council to meet certain conditions. These conditions have now been met and are discussed in more detail below:

Condition 1: Prior to undertaking public exhibition, Council is to update the 'objectives or intended outcomes' within the planning proposal to identify the uses proposed for the subject land. The planning proposal is to be updated to correctly reference the name of the zone for land proposed to be rezoned for special purposes - railway.

Comments

The Planning Proposal has been updated and now includes a description of the intended land uses of the site.

It is proposed that the part of the site located north of Cambridge Avenue be used for industrial development with a focus on warehousing and logistics. The part of the site that is located south of Cambridge Avenue is proposed to be used for car parking purposes to service the future industrial development.

Notably, if the land is to be rezoned to Zone IN1 General Industrial under the CLEP a range of additional land uses will become permissible as follows:

Animal boarding or training establishments; Boat building and repair facilities; Car parks; Depots; Environmental facilities; Environmental protection works; Flood mitigation works; Freight transport facilities; General industries; Helipads; Highway service centres; Industrial retail outlets; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Mortuaries; Neighbourhood shops; Passenger transport facilities; Places of public worship; Roads; Rural industries; Rural supplies; Service stations; Sex services premises; Signage; Storage premises; Take away food and drink premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres

Condition 2: Prior to undertaking public exhibition, Council is to update the planning proposal to include sufficient additional information to adequately demonstrate consistency or justify any inconsistency with the below S117 Directions:

- No 2.3 Heritage Conservation
- No 2.3 3.4 Integrating Land Use and Transport
- No 2.3 4.3 Flood Prone Land.

Comments

The planning proposal has been updated to adequately demonstrate consistency or justify any inconsistency with the above S117 Directions. A copy of the revised draft Planning Proposal is shown under Attachment 2.

Condition 3: Additional information regarding the below matters is to be placed on public exhibition with the planning proposal:

- flora and fauna
- heritage
- acoustic (noise impact)
- traffic impact (road network capacity and infrastructure improvements).

Comments

Additional information in regard to the above matters has been prepared by the applicant and submitted to Council as follows:

1. Flora and Fauna

An Ecological Assessment for the GWS, prepared by Environmental Property Services has been submitted. The ecological study is supported by a number of field surveys and studies including an assessment of the woodland vegetation, a detailed flora and fauna field surveys and hollow bearing tree assessment.

The additional information has been prepared by the applicant in consultation with Council's officers and the Office of Environment and Heritage (OEH).

The main findings of the ecological study are as follows:

- The subject site supports vegetation that meets the criteria for Cumberland Plain Shale Woodlands, which is listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act)
- Threatened bat species were recorded during the targeted surveys being *Pteropus poliocephalus* (Grey-headed Flying-fox), *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat), *Mormopterus norfolkensis* (East-coast Freetail-bat), *Miniopterus australis* (Little Bentwing bat) and *Miniopterus schreibersii oceanensis* (Eastern Bentwing bat)
- No threatened frog, waterbird, arboreal mammal, or fish species were identified during surveys and are considered unlikely to occur on the investigation area
- The investigation area supported a farm dam which provided an area of open, deep water for common waterbird species
- The investigation area supported a relatively high number of hollow bearing trees.

In November 2014 an additional Biobanking Credit Assessment (Field Work Report), and a Cumberland Plain Shale Woodlands Assessment were prepared by SLR Consulting Australia Pty Ltd for the Glenfield Site. The draft biodiversity offset is a proposed option to provide compensation for any impacts upon the Cumberland Plain Shale Woodland. Further consultation with the Commonwealth Department of Environment and OEH at the subdivision stage would be required to determine the best pathway for providing the best possible ecological outcomes for the site.

The additional information provided by the applicant in relation to flora and fauna is considered sufficient for the rezoning stage and will be placed on public exhibition as part of the planning proposal. However, it is considered important that the amendment to the CLEP include a specific requirement (additional local clause) for a detailed biodiversity offset strategy to be prepared as part of any development application for industrial development on the site that proposes to remove vegetation.

Given that the site contains critically endangered vegetation, it is recommended that while the planning proposal is on public exhibition, Council formally consult with the Chief Executive of the Office of Environment and Heritage as required by Section 34A (Special Consultation Procedures Concerning Threatened Species) of the *Environmental Planning and Assessment Act 1979.*

2. Heritage

There is no significant European cultural heritage located on the subject site.

Additional information in relation to aboriginal heritage has been prepared by the applicant in consultation with Council's officers and OEH. Archaeological and Heritage Management Solutions Pty Ltd (AHMS) prepared an Aboriginal Heritage Preliminary Assessment report for the rezoning of the site. The additional information included an assessment of significance with the preliminary assessments identifying four specific sites that had the potential for Aboriginal Archaeological significance.

Council consulted further with OEH, and as a result the applicant was required to provide additional information for the rezoning stage. The additional information included an assessment that reviewed the heritage significance of the four specific sites identified as part of its preliminary assessment.

Three sites were found to have 'low' value and only one site located south of Cambridge Avenue was identified to have a 'moderate' value, and therefore, has the potential to contain extensive and/or old cultural materials. The majority of this site is currently zoned RE1 Public Recreation with a portion zoned SP2 Road. This planning proposal does not seek to vary those zones. In addition to the RE1 and SP2 Zones, part of the site is also currently zoned 1(a) Rural under LEP 2002. This part of the site is proposed to be rezoned SP2 Car Park for car parking purposes.

Additional characterisations of this site deposit and more detailed investigations of this area should occur at the development application stage. Notably, a special site card for this area has been completed and lodged with the Aboriginal Heritage Information Management System registrar to ensure that this area will be identified at the development application stage and suitable conditions included in any consent issued on the land for the appropriate archaeological management of the site.

The additional information provided by the applicant in relation to aboriginal heritage is considered sufficient at this stage. OEH prefers a more rigorous archaeological investigation to be undertaken to identify the nature and extent of any archaeological deposits prior to rezoning rather than at the development stage. However, OEH advised, if no further assessment will be undertaken at this stage, more information should be included in the report about potential level of impact that will occur to the site as a result of the proposed development.

In this regard, Council will be further consulting with the aboriginal communities, while the planning proposal is on public exhibition, and seek their views on this matter.

3. Acoustic (noise impact)

SLR Consulting, on behalf of the applicant has undertaken a noise assessment relating to the proposed rezoning of the southern parcel of the GWS.

The aim of this assessment was to assess the potential noise impacts from land use changes associated with the rezoning on surrounding sensitive receptors i.e. residential premises. Noise emission levels for a hypothetical industrial estate were predicted to comply with the relevant noise goals during day, evening and night-time periods at all existing residential locations considered under calm and prevailing weather conditions. Furthermore, no specific noise mitigation measures, besides the existing mound and fence, have been included in the noise model. It is possible that actual noise emissions from the proposed industrial estate would be less than those predicted.

Predicted noise levels could be greatly reduced with judicious planning along with the use of equipment incorporating 'quiet' engineering design, the addition of acoustically designed enclosures, noise barriers or using management techniques. It is also possible that considerable screening of acoustically significantly activities would be provided by buildings once the site is developed.

4. Traffic impact (road network capacity and infrastructure improvements)

AECOM on behalf of the applicant prepared a preliminary Traffic and Transport Review of the subject site.

The findings of the review indicates that the site would appear to be appropriate for 'Zone IN1 General Industrial Zone' from a transport perspective, subject to further detailed traffic impact assessment to determine the capacity of the existing network and identify the extent of required infrastructure improvements.

The site currently has two access points. It is proposed that an additional access point be created from Cambridge Avenue to service the future industrial developments at the site.

In addition to the preliminary Traffic and Transport Review prepared by AECOM, Anton Reisch Consulting Pty Ltd prepared a detailed Traffic Impact Assessment on behalf of the applicant to appropriately assess the potential traffic and transport impacts arising from the Proposal. Following is a dot point summary of the findings of this study:

- In the AM (commuter peak hour 7:00am – 8:00am) the Site trip generation is estimated at 265 vehicle trips per hour (vph), and in the PM (commuter peak hour 4:00pm – 5:00pm) the Site trip generation is estimated at 275vph
- The Site provides 2 existing access points to the local road network, Cambridge Avenue and Railway Parade. The intersection of Cambridge Avenue currently provides primary access to the Site, but the volume of additional trips generated by the Proposal dictates that a new intersection will need to be provided to Cambridge Avenue to service the rezoned land
- The Proposal would have only a very moderate impact on the road network through to the year 2024.

Condition 4: Community consultation is required under sections 56(2)(c) and 57 of the *Environmental Planning and Assessment Act 1979* ("EP&A Act") as follows:

- the planning proposal must be made publicly available for a minimum of 28 days
- the relevant planning authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 5.5.2 of A Guide to Preparing LEPs (Department of Planning & Infrastructure 2012).

Comments

It is recommended that that the planning proposal be placed on public exhibition as per the above condition. In addition it is recommended that all residential properties that are located adjacent to the site be individually notified of the public exhibition of the planning proposal.

Condition 5: Consultation is required with the following public authorities under section 56(2)(d) of the EP&A Act and/or to comply with the requirements of relevant S117 Directions:

- Transport for NSW
- Railcorp
- Sydney Water
- Telstra
- Transgrid
- Sydney Catchment Authority
- Sydney Metropolitan Catchment Management Authority
- Office of Environment and Heritage
- NSW Department of Primary Industries -Agriculture
- NSW Trade and Investment - Minerals and Petroleum (S117 Direction 1.3 Mining, Petroleum Production and Extractive Industries)
- NSW Rural Fire Service (S117 Direction 4.4 Planning for Bushfire Protection)
- Office of Strategic Lands regarding the dedication of land, which adjoins the eastern boundary of the subject land and which is zoned 6(b) Regional Open Space under Campbelltown (Urban Area) LEP 2002, and its removal from the Land Reservation Acquisition Map.
- Adjoining LGAs.

To date Council has consulted with the following public authorities:

1. Transport for NSW

Council consulted with Transport for NSW in relation to the proposed rezoning of Lot 92 DP 1155962 (owned by Transport for NSW). No official/written response has yet been received from Transport for NSW, however verbal advice indicated that there is no objection to the proposed rezoning. Council will consult again with Transport for NSW while the proposal is on public exhibition.

2. Office of Environment and Heritage

Council consulted with OEH in relation to the required flora and fauna study and the Preliminary Aboriginal Heritage Study. The applicant undertook additional surveys and studies as required by Council and OEH. Council will consult with OEH again, while the proposal is on public exhibition.

3. Office of Strategic Lands

The matter relating to land acquisition has been resolved. The applicant undertook a survey plan in consultation with OSL, and the land acquisition map is proposed to be amended as shown as Map 3.11 under attachment 2 to reflect the outcome of the consultation.

4. NSW Roads and Maritime Services

Council has consulted with NSW Roads and Maritime Services (RMS) in relation to the scope of the traffic impact assessment. Council received an email in relation to the matters that need to be addressed by the traffic impact assessment. The applicant has prepared a traffic impact assessment taking into consideration feedback from RMS and Council's Engineers.

Notably, Council will consult with all relevant public agencies listed under the gateway conditions of the revised Gateway Determination during the public exhibition of the draft Planning Proposal.

Proposed additional local clauses to the CLEP for the Glenfield Waste Site

A number of additional requirements became apparent as a result of the additional investigations/studies prepared for the site by the consultant, consultation with the Office of Environment and Heritage and/or the review of those studies by Council's officers as discussed above.

The additional proposed requirements as part of the amendments to the CLEP are as follows:

a) Development Control Plan/Master Plan

Prior to any future development application for industrial purposes for this site, a development control plan/master plan shall be prepared for the site that shows the internal road layout, entry points to the site, stormwater detention basins (where required) and the extent of the vegetation proposed to be cleared.

b) Flood and stormwater management plan

A detailed flood and stormwater management plan shall be prepared as part of the development application for the site.

c) Access arrangement to the site

Vehicle access to the site shall be flood free and satisfy the consent authority that the local road network is not adversely affected. A third access from the site shall be provided at Cambridge Avenue.

d) Vegetation management

Where vegetation on site is proposed to be cleared, the applicant shall implement an offsetting strategy to Council's satisfaction.

e) Restriction on the type of vehicles to use the area south of Cambridge Avenue that is proposed for car parking purposes

It is proposed to add an additional requirement under the CLEP to restrict any vehicle with a GVM mass of more than 4.5 tonnes within the area proposed to be rezoned for car parking services. This would minimise noise on the adjacent residential neighbourhoods.

Conclusion

The draft planning proposal to enable the Glenfield waste site to be developed for industrial purposes presents an opportunity to provide additional industrial development within the Campbelltown LGA. The site is ideally located for this type of development and would provide much needed local jobs for Campbelltown residents. While the subject site is within close proximity to public infrastructure and Glenfield Railway Station, it is physically isolated from nearby residential development by roads and the parcel of land south of Cambridge Avenue, Glenfield.

The site has major biodiversity values, and prior to the removal of any vegetation on site, an offsetting strategy must be prepared and implemented to the satisfaction of Council and any other relevant public authorities.

The draft planning proposal has been revised based on the additional information provided by the applicant and the gateway conditions.

It is recommended that Council endorse the public exhibition of the revised planning proposal and associated studies (attachment 2) as per the Gateway Conditions.

Officer's Recommendation

1. That Council endorse the public exhibition of the draft planning proposal and associated technical studies for the Glenfield Waste Site as per the Gateway Determination Conditions.

2. That the residential properties immediately adjacent to the site be notified of the public exhibition of the draft planning proposal.

3. That a further report be submitted to Council on the outcome of the public consultation.

4. That Council advise the applicant of Council's decision.

Committee's Recommendation: **(Lound/Thompson)**

That the Officer's Recommendation be adopted.

CARRIED

Voting for the Committee's Recommendation were Councillors: Greiss, Kolkman, Lound, Oates, Rowell and Thompson.

Voting against the Committee's Recommendation: Nil.

Council Meeting 22 March 2016

Having declared an interest in regard to Item 2.4, Councillors Hawker and Lake left the Chamber and did not take part in debate nor vote on this item. In the absence of the Chairperson, His Worship the Mayor, Councillor Hawker, Deputy Mayor, Councillor Matheson chaired the meeting for this item.

Council Meeting 22 March 2016 (Greiss/Oates)

1. That Council endorse the public exhibition of the draft planning proposal and associated technical studies for the Glenfield Waste Site as per the Gateway Determination Conditions.

2. That the residential properties immediately adjacent to the site be notified of the public exhibition of the draft planning proposal.

3. That a further report be submitted to Council on the outcome of the public consultation.

4. That Council advise the applicant of Council's decision.

Council Resolution Minute Number 29

1. That Council endorse the public exhibition of the draft planning proposal and associated technical studies for the Glenfield Waste Site as per the Gateway Determination Conditions.

2. That the residential properties immediately adjacent to the site be notified of the public exhibition of the draft planning proposal.

3. That a further report be submitted to Council on the outcome of the public consultation.

4. That Council advise the applicant of Council's decision.

Voting for the Council Resolution were Councillors: Borg, Brticevic, Chanthivong, Dobson, Glynn, Greiss, Kolkman, Lound, Matheson, Mead, Oates, Rowell and Thompson.

Voting against the Council Resolution: Nil.

At the conclusion of the discussion regarding Item 2.4, Councillors Hawker and Lake returned to the Chamber and His Worship the Mayor, Councillor Hawker resumed the Chair.

ATTACHMENT 1

NSW GOVERNMENT | Planning & Infrastructure

Contact: Georgina Ballantine
Phone: (02) 9860 1560
Email: Georgina.Ballantine@planning.nsw.gov.au
Postal: GPO Box 39 Sydney NSW 2001

Our ref: PP_2013_CAMPB_002_00 (13/10832)

Mr Paul Tosi
General Manager
Campbelltown City Council
PO Box 57
CAMPBELLTOWN NSW 2560

Dear Mr Tosi, Paul

Planning proposal to amend draft Campbelltown Local Environmental Plan 2013

I am writing in response to your Council's letter dated 19 June 2013 requesting a Gateway determination under section 56 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") in respect of the planning proposal to zone the Glenfield Waste Site at Cambridge Avenue, Glenfield to IN1 General Industrial, SP2 Infrastructure (Car Parks) and SP2 Infrastructure (Railway) and apply a maximum building height of 12m on land proposed to be zoned IN1.

As delegate of the Minister for Planning and Infrastructure, I have now determined the planning proposal should proceed subject to the conditions in the attached Gateway determination.

I have also agreed the planning proposal's inconsistencies with S117 Directions 1.2 Rural Zones and 1.5 Rural Lands are justified by studies or the draft South West Subregional Strategy. No further approval is required in relation to these Directions.

Council may still need to obtain the Director General's agreement to satisfy the requirements of relevant S117 Directions. Council should ensure this occurs prior to the plan being made.

The Minister delegated his plan making powers to councils in October 2012. I understand that Council has not asked to be issued with delegation for this planning proposal because of the size of the site and the complexity of the proposal. I have considered the nature of Council's planning proposal and have decided not to issue an authorisation for Council to exercise delegation to make this plan.

The amending Local Environmental Plan (LEP) is to be finalised within 12 months of the week following the date of the Gateway determination. Council should aim to commence the exhibition of the planning proposal as soon as possible. Council's request for the department to draft and finalise the LEP should be made 6 weeks prior to the projected publication date.

The State Government is committed to reducing the time taken to complete LEPs by tailoring the steps in the process to the complexity of the proposal, and by providing clear and publicly available justification for each plan at an early stage. In order to meet these commitments, the Minister may take action under section 54(2)(d) of the EP&A Act if the time frames outlined in this determination are not met.

Should you have any queries in regard to this matter, please contact Georgina Ballantine of the regional office of the department on 02 9860 1560.

Yours sincerely,

per 6.8.13.

Daniel Keary
Acting Executive Director
Metropolitan Planning
Planning Operations and Regional Delivery

NSW GOVERNMENT | Planning & Infrastructure

Gateway Determination

***Planning proposal (Department Ref: PP_2013_CAMPB_002_00)**: to zone the Glenfield Waste Site for industrial and special purposes and amend the maximum building height.*

I, the Acting Executive Director, Metropolitan Planning at the Department of Planning and Infrastructure as delegate of the Minister for Planning and Infrastructure, have determined under section 56(2) of the EP&A Act that an amendment to the draft Campbelltown Local Environmental Plan (LEP) 2013 to zone the Glenfield Waste Site at Cambridge Avenue, Glenfield to IN1 General Industrial, SP2 Infrastructure (Car Parks) and SP2 Infrastructure (Railway) and apply a maximum building height of 12m on land proposed to be zoned IN1 should proceed subject to the following conditions:

1. Prior to undertaking public exhibition, Council is to update the 'objectives or intended outcomes' within the planning proposal to identify the uses proposed for the subject land. The planning proposal is to be updated to correctly reference the name of the zone for land proposed to be rezoned for special purposes - railway.

2. Prior to undertaking public exhibition, Council is to update the planning proposal to include sufficient additional information to adequately demonstrate consistency or justify any inconsistency with the below S117 Directions:

   - 2.3 Heritage Conservation
   - 3.4 Integrating Land Use and Transport
   - 4.3 Flood Prone Land

3. Additional information regarding the below matters is to be placed on public exhibition with the planning proposal:

   - flora and fauna
   - heritage
   - acoustic (noise impact)
   - stormwater management and flooding
   - traffic impact (road network capacity and infrastructure improvements)

4. Community consultation is required under sections 56(2)(c) and 57 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") as follows:

   (a) the planning proposal must be made publicly available for a minimum of **28 days**; and
   (b) the relevant planning authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 5.5.2 of *A Guide to Preparing LEPs (Department of Planning & Infrastructure 2013)*.

5. Consultation is required with the following public authorities under section 56(2)(d) of the EP&A Act and/or to comply with the requirements of relevant S117 Directions:

   - Transport for NSW
   - Railcorp
   - Sydney Water
   - Telstra
   - Transgrid

NSW GOVERNMENT Planning & Infrastructure

- Sydney Catchment Authority
- Sydney Metropolitan Catchment Management Authority
- Office of Environment and Heritage
- NSW Department of Primary Industries – Agriculture
- NSW Trade and Investment – Minerals and Petroleum (S117 Direction 1.3 Mining, Petroleum Production and Extractive Industries)
- NSW Rural Fire Service (S117 Direction 4.4 Planning for Bushfire Protection)
- Office of Strategic Lands regarding the dedication of land, which adjoins the eastern boundary of the subject land and which is zoned 6(b) Regional Open Space under Campbelltown (Urban Area) LEP 2002, and its removal from the Land Reservation Acquisition Map.
- Adjoining LGAs

Each public authority is to be provided with a copy of the planning proposal and any relevant supporting material, and given at least 21 days to comment on the proposal.

6. A public hearing is not required to be held into the matter by any person or body under section 56(2)(e) of the EP&A Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing (for example, in response to a submission or if reclassifying land).

7. The timeframe for completing the LEP is to be **12 months** from the week following the date of the Gateway determination.

Dated 6th day of August 2013.

Daniel Keary
Acting Executive Director
Metropolitan Planning
Planning Operations and Regional Delivery
Department of Planning and Infrastructure

Delegate of the Minister for Planning and Infrastructure

CAMPBELLTOWN PP_2013_CAMPB_002_00 (13/10832)

NSW GOVERNMENT | Planning & Infrastructure

Contact: Georgina Ballantine
Phone: 02 9860 1568
Email: georgina.ballantine@planning.nsw.gov.au

Our ref: PP_2013_CAMPB_002_00

DEC16'13 03:14:23

Mr Paul Tosi
General Manager
Campbelltown City Council
PO Box 57
CAMPBELLTOWN NSW 2560

Attention: Andrew Spooner/Rana Haddad

Dear Mr Tosi

Thank you for your letter of 3 October 2013, regarding additional information in relation to the Gateway Determination for the Glenfield Waste Site planning proposal.

I have considered the matters raised in your letter and advise as follows:

A. Consistency with Section 117 Directions

2.3 Heritage Conservation
The additional information submitted in Council's letter (Attachment 1) sufficiently addresses the requirements of Section 117 Directions: 2.3 Heritage Conservation. The proposal is considered to be consistent with this direction.

3.4 Integrating Land Use and Transport
To justify the proposal's consistency with Clause 5(b) of this direction, it is suggested that Council's response refers to the Traffic and Transport Review (prepared by AECOM on behalf of the proponent) and includes additional information relating to cycling and pedestrian options.

4.3 Flood Prone Land
To justify the proposal's inconsistency with this direction as being of minor significance, it is suggested that Council's response to 4.3 Flood Prone Land includes the additional information provided by Council relating to stormwater management and flooding (**Tag A**: pg 2) and references the requirement to provide an alternative site access on Cambridge Avenue, Glenfield (see comments below).

B. Stormwater Management and Flooding

- Council is **not** required to submit additional information for stormwater management and flooding.

In accordance with the above, please find an amended Gateway Determination attached.

I hope this information assists you and should have any further questions please contact Georgina Ballantine of the Sydney West regional team on 02 9860 1568.

Yours sincerely

9/12/13

Daniel Keary
Acting Executive Director
Metropolitan Planning
Planning Operations and Regional Delivery

Bridge St Office 23-33 Bridge St Sydney NSW 2000 GPO Box 39 Sydney NSW 2001
Telephone: (02) 9228 6111 Facsimile: (02) 9228 6191 Website planning.nsw.gov.au

Gateway Determination

Planning proposal (Department Ref: PP_2013_CAMPB_002_00): to zone the Glenfield Waste Site for industrial and special purposes and amend the maximum building heights.

I, the Acting Executive Director, Metropolitan Planning, at the Department of Planning and Infrastructure, as delegate of the Minister for Planning and Infrastructure, have determined under section 56(2) of the EP&A Act, that an amendment to the draft Campbelltown Local Environmental Plan (LEP) 2013 to zone the Glenfield Waste Site at Cambridge Avenue, Glenfield to IN1 General Industrial, SP2 Infrastructure (Car Park) and SP2 Infrastructure (Railway) and apply a maximum building height of 12m on land proposed to be zoned IN1 should proceed, subject to the following conditions:

1. Prior to undertaking public exhibition, Council is to update the 'objectives or intended outcomes' within the planning proposal to identify the uses proposed for the subject land. The planning proposal is to be updated to correctly reference the name of the zone for land proposed to be rezoned for special purposes - railway.

2. Prior to undertaking public exhibition, Council is to update the planning proposal to include sufficient additional information to adequately demonstrate consistency or justify any inconsistency with the below S117 Directions:

   • 2.3 Heritage Conservation
   • 3.4 Integrating Land Use and Transport
   • 4.3 Flood Prone Land

3. Additional information regarding the below matters is to be placed on public exhibition with the planning proposal:

   • flora and fauna
   • heritage
   • acoustic (noise impact)
   • traffic impact (road network capacity and infrastructure improvements)

4. Community consultation is required under sections 56(2)(c) and 57 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") as follows:

   (a) the planning proposal must be made publicly available for a minimum of **28 days;** and
   (b) the relevant planning authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 5.5.2 of *A Guide to Preparing LEPs (Department of Planning & Infrastructure 2013).*

5. Consultation is required with the following public authorities under section 56(2)(d) of the EP&A Act and/or to comply with the requirements of relevant S117 Directions:
   • Transport for NSW
   • Railcorp
   • Sydney Water
   • Telstra
   • Transgrid

- Sydney Catchment Authority
- Sydney Metropolitan Catchment Management Authority
- Office of Environment and Heritage
- NSW Department of Primary Industries — Agriculture
- NSW Trade and Investment — Minerals and Petroleum (S117 Direction 1.3 Mining,Petroleum Production and Extractive Industries)
- NSW Rural Fire Service (S117 Direction 4.4 Planning for Bushfire Protection)
- Office of Strategic Lands regarding the dedication of land, which adjoins the eastern boundary of the subject land and which is zoned 6(b) Regional Open Space under Campbelltown (Urban Area) LEP 2002, and its removal from the Land Reservation Acquisition Map.
- Adjoining LGAs

6. Each public authority is to be provided with a copy of the planning proposal and any relevant supporting material, and given at least 21 days to comment on the proposal.

7. A public hearing is not required to be held into the matter by any person or body under section 56(2)(e) of the EP&A Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing (for example, in response to a submission or if reclassifying land).

8. The timeframe for completing the LEP is to be **12 months** from the week following the

Dated 9th DECEMBER 2013.

Daniel Keary
Acting Executive Director
Metropolitan Planning
Planning Operations and Regional Delivery

NSW GOVERNMENT | Planning & Environment

FEB15'16 07:56:02 RCVD

Contact: Michelle Dellagiacoma
Phone: 02 9860 1527
Email: Michelle.Dellagiacoma
@planning.nsw.gov.au
Our ref: 15/17815
Your ref:

Ms Lindy Deitz
The General Manager
Campbelltown City Council
PO Box 57
CAMPBELLTOWN NSW 2560

Dear Ms Deitz

Request for a revised Gateway determination: PP_2013_CAMPB_001_00 for the Glenfield waste Site, Glenfield.

I am writing in response to your request for a revised Gateway determination for the Glenfield Waste site. As delegate of the Greater Sydney Commission, I have decided under s56(7) of the Environmental Planning and Assessment Act, 1979, to alter the Gateway Determination issued on 9 December 2013, referred to above, to apply to the additional land as identified in the revised proposal of January 2016. I have also extended the proposal for a further 9 months until the 15th September 2016. The Alteration of the Gateway Determination is enclosed.

I note Council has requested the revision as a result of its consultation with the Office of Strategic Lands during the consultation of the Campbelltown Local Environmental Plan 2015. The planning proposal is considered to be consistent with the requirements of Section 117 Direction 6.2.

I also note the area is contiguous with the existing site area and most of the studies done to date incorporate the additional area. Any future studies should include the additional area.

If you have any queries in regard to this matter, please contact Michelle Dellagiacoma of the Metropolitan Region (Parramatta) office on 02 9860 1527

Yours sincerely

RJ Cumming 5/2/2016

Rachel Cumming
Director, Metropolitan Parramatta
Planning Services

Bridge St Office 23-33 Bridge St Sydney NSW 2000 GPO Box 39 Sydney NSW 2001 DX 22 Sydney Telephone: (02) 9228 6111 Facsimile: (02) 9228 6191 Website planning.nsw.gov.au

Alteration of Gateway Determination

Planning proposal (Department Ref: PP_2013_CAMPB_002_00) *[to amend the Campbelltown Local Environmental Plan 2015 for land at the Glenfield Waste Site, Glenfield.]*

I, the Director, Metropolitan Region, Parramatta at the Department of Planning and Environment, as delegate of the Greater Sydney Commission, have determined, under section 56(7) of the Environmental Planning and Assessment Act 1979 ("EP&A Act"), to alter the Gateway determination dated 9 December 2013, for the proposed amendment to the Campbelltown Local Environmental Plan 2015 as follows:

1. To alter the site boundary to which the proposal applies to include additional land, as shown in the revised Planning Proposal dated January 2016 - Version 7, and to apply the IN1 General Industrial zone to the additional area, and, as a consequence of this change, to alter the Land Acquisitions Map and acquisition obligations as appropriate.
2. Delete:
   Condition "7" and replace with:

   A new condition 7 "the LEP is to be finalised by 15 September 2016."

Dated 5th day February 2016.

RJCumming

Rachel Cumming
Director, Metropolitan Region (Parramatta)
Planning Services

Delegate of the Greater Sydney Commission

ATTACHMENT 2

Planning Proposal

Glenfield Waste Site

Campbelltown City Council

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Attachments

Attachment 1: Letters received from the Department of Planning and Environment

Attachment 2 : Technical Studies, Flood Map and Bushfire Prone Land Map

Attachment 2.1 - Infrastructure Report (SMEC Urban, May 2012)

Attachment 2.2 - Traffic Impact Assessment (Anton Reisch Consulting Pty Ltd, October 2014)

Attachment 2.3 - Traffic and Transport Report, (AECOM, May 2013)

Attachment 2.4 - Glenfield Ecological Assessment (Environmental Property Services, updated May 2015)

Attachment 2.5 - Aboriginal Heritage Preliminary Assessment (Alan Williams, updated August 2014)

Attachment 2.6 - Contamination Land Report (Consulting Earth Scientists, May 2012)

Attachment 2.7 - Noise Impact Assessment (SLR Global Environmental Solutions, April 2015)

Attachment 2.8 – Upper Georges River Flood Study

Attachment 2.9 – Flood Map

Attachment 2.10 – Bushfire Prone Land Map

Attachment 3: Maps

Map 3.1 Location Plan of the Subject Site

Map 3.2 Aerial Photo of the Subject Site

Map 3.3 Existing Zoning Map under LEP 2002

Map 3.4 Existing Zoning Map under the CLEP

Map 3.5 Proposed Zoning Map under the CLEP

Map 3.6 Existing Lot Size Map under the CLEP

Map 3.7 Proposed Lot Size Map under the CLEP

Map 3.8 Existing Height Map under the draft CLEP

Map 3.9 Proposed Height of Buildings Map under the CLEP

Map 3.10 Existing Land Reservation Acquisition Map under the CLEP

Map 3.11 Proposed Land Reservation Acquisition Map under the CLEP

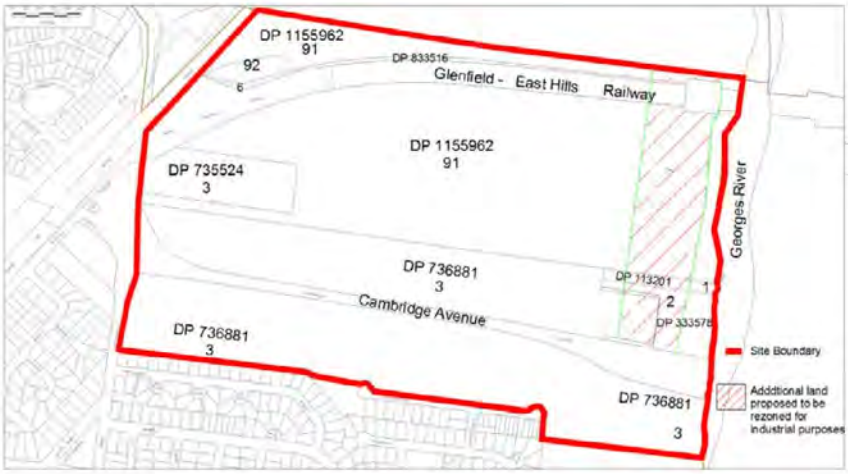
Map 3.12 Survey Plan Map – Boundary Adjustment

History

- This Planning Proposal relates to the Glenfield Waste Site, located at Cambridge Avenue, Glenfield.
- In June 2012, Environmental Planning Services on behalf of the owners of the Glenfield Waste Site submitted to Council a planning proposal to enable the subject site to be used for industrial development and car parking purposes.
- Council officers reviewed the applicant's planning proposal and prepared a revised Planning Proposal.
- Council on 19 June 2013 submitted the Planning Proposal to the Department of Planning and Environment (the Department) and later received a Gateway Determination (dated 6 August 2013) shown under Attachment 1.
- Council on 3 October 2013 provided the Department with additional information to address the matters raised by the Gateway Determination.
- As a result, Council received a revised Gateway Determination from the Department, dated 9 December 2013 a copy of which is shown under Attachment 1.
- The revised Gateway Determination required Council, prior to public exhibition, to provide additional information to adequately demonstrate consistency or justify any inconsistencies with some of the S117 Directions, undertake a number of additional studies and consult with a number of public authorities.
- To date Council consulted with a number of public authorities including the Office of Environment and Heritage (OEH), Roads and Maritime Services (RMS) and the Office of Strategic Lands (OSL).
- Further consultation with all the relevant public agencies will occur during the public exhibition period, as per the requirements of the revised Gateway Determination.
- In line with the conditions of the revised Gateway Determination the applicant provided additional information in relation to the following:
  - Flora and fauna
  - Heritage
  - Acoustic (noise impact)
  - Traffic impact (road network capacity and infrastructure improvements)
- The Planning Proposal has been updated to reflect the findings of the additional studies and consultation with OEH and OSL. A copy of the technical studies is shown under Attachment 2 of this planning proposal.
- An open space corridor (approximately 160 metres in width) is located between the Glenfield Waste Site and the Georges River. This strip of land is currently zoned RE1 Public Recreation under the Campbelltown Local Environmental Plan 2015 (the CLEP).

A large portion of this open space has been subject to landfill practices as part of the historical operation of the Glenfield Waste Site. This strip of open space was not originally included as part of the site subject to this planning proposal as it was assigned a zone of RE1 Public Recreation under the then draft CLEP 2014, while the Glenfield Waste Site was marked as a 'deferred matter' under the zoning maps of the then draft CLEP.

- As part of consultation with public authorities during the preparation of the then draft CLEP, Council consulted with the OSL in relation to land acquisition matters.
- OSL advised Council that it would only be interested in acquiring the part of the open space corridor that does not contain landfill.
- Accordingly, and in consultation with OSL, the applicant prepared a survey plan to ascertain the exact boundary of the strip of land to be acquired by OSL. A copy of the survey plan is shown under Attachment 3 (Map 3.12) of the planning proposal.
- In August 2015, the applicant submitted to Council a survey plan that shows the exact boundary of the land to be acquired by OSL (ranges approximately from 40m to 70m in width). OSL advised Council that the survey plan reflects what has been agreed between the owner/applicant and OSL.
- As a result, the site subject to this planning proposal has been amended to include the open space corridor located adjacent to the Georges River. The part of this strip that will not be acquired by OSL is proposed to be rezoned for industrial purposes.
- Given that the site boundary of the planning proposal has been amended to include the additional land, Council sought a revised gateway determination based on the new boundary of the site and the additional information provided under this Planning Proposal. Figure1 below shows the additional land to be rezoned for industrial purposes and the new site boundary.



- On 8 February 2016, Council received a letter from the Department of Planning which included an 'Alteration of Gateway Determination'. The alteration addressed the site boundary variation and extended the date for the finalisation of the proposed rezoning to 15 September 2016. A copy of the Department's letter and the Alteration to the Gateway Determination are included as part of Attachment 1.

The parcels of land that are proposed to be rezoned as part of this amendment to the CLEP are listed in the table below. The total site area is approximately 60 hectares and approximately 40 hectares is proposed to be rezoned for industrial purposes

Figure 1 The Glenfield Waste Site showing the additional land to be rezoned for industrial purposes

Parcel Description	Property Address	Owners Name	Property Area (m2)
Lot 3 DP 735524	Lot 3 Canterbury Road, GLENFIELD NSW 2167	Figela Pty Ltd	24320
Lot 2 DP 333578	Lot 1 Cambridge Avenue, GLENFIELD NSW 2167	JC & FW Kennett Pty Ltd	13460
Lot 1 DP 113201	Lot 1 Cambridge Avenue, GLENFIELD NSW 2167	JC & FW Kennett Pty Ltd	4148
Lot 3 DP 736881	Lot 3 Cambridge Avenue, GLENFIELD NSW 2167	Figela Pty Ltd	252100
Lot 91 DP 1155962	Lot 1 Cambridge Avenue, GLENFIELD NSW 2167	JC & FW Kennett Pty Ltd	294900
Lot 92 DP 1155962	Lot 92 Canterbury Road, GLENFIELD NSW 2167	Transport For NSW	4661

Background

The Glenfield Waste Site is a triangular shaped parcel of land bounded by the Georges River to the east, the Southern Rail Line to the west and the Glenfield residential area to the south as illustrated in the Figure 1.1 Below

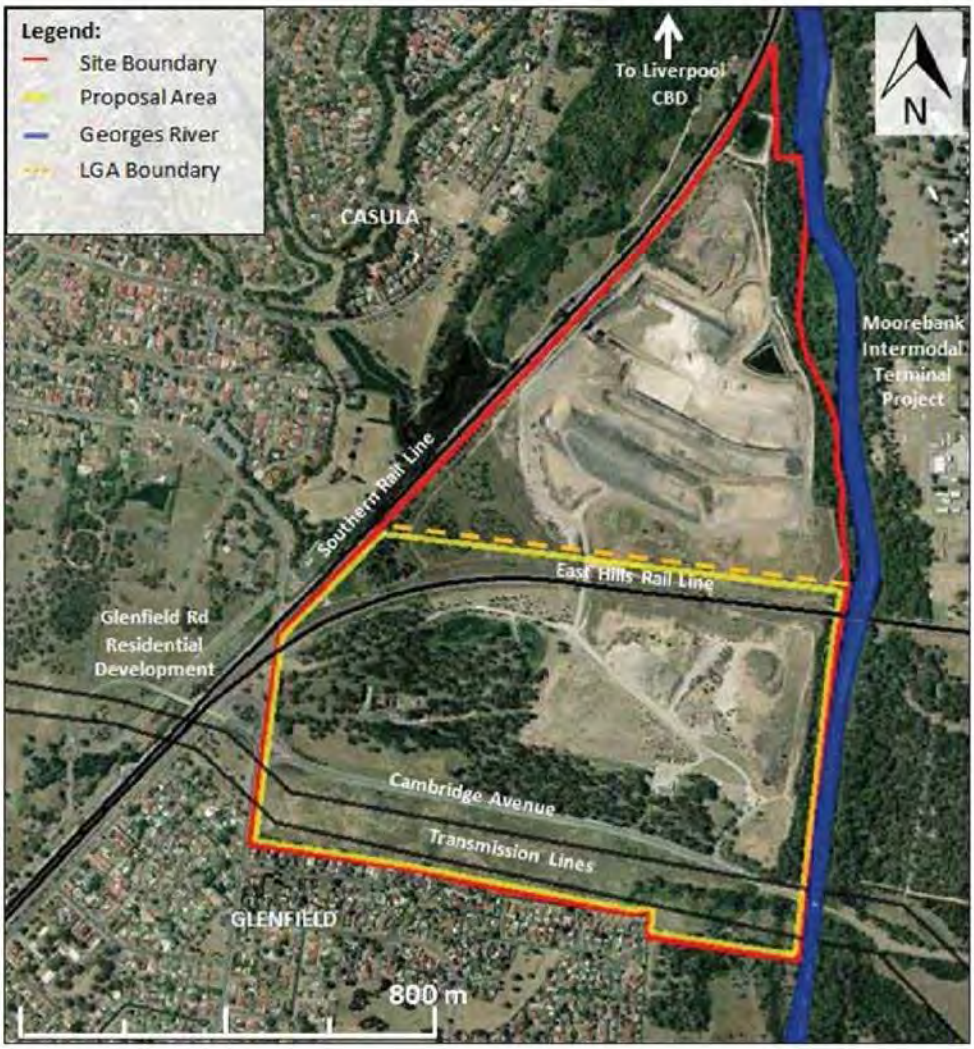


Figure 1.1: Glenfield Waste Site

The Glenfield Waste Site is bisected by a local government boundary (LGA) i.e. the Liverpool LGA to the north, and Campbelltown LGA to the south as illustrated in Figure 1.1.

The southern parcel of land is approximately 60 hectares in area and located at Cambridge Avenue, Glenfield (the site).

Current Land Use Activities

The Glenfield Waste Site's northern and southern parcels of land function as the Glenfield Waste Services Facility.

The primary land use activities conducted on the northern parcel of land are soil and sand extraction and non – putrescible solid waste land fill. To create the land fill cells, soil/clay, shale and sandstone are extracted and stockpiled for various operational applications.

Waste is delivered to the landfill cell where it is then sorted for recyclables (brick, concrete, steel timber etc.) and processed by shredding prior to being compacted to minimise the cubic metre capacity and maximise the density. This is in turn allows for a longer lifespan of the landfill cell, which is important as space is a limited resource and suitable landfill sites are well documented to be in short supply within the Sydney Metropolitan Area.

At the end of each day, waste that has been placed in the cells and compacted is covered with a layer of the extracted soil/clay/shale. This minimises odour and prevents litter from escaping into the surrounding environment. The excess shale and sandstone are exported from the site as a saleable resource and used in the building and construction industries.

The primary land use activity conducted on the southern parcel of land is recycling of waste which is predominantly construction and demolition waste.

The southern parcel of land accommodates the weigh bridge, the site office, mechanical plant workshop and the site manager's premises/offices. Operationally it serves as the depot for various plant and earth moving equipment, bin storage areas and sediment control basins for storm water management. Importantly, the southern parcel of land provides the access to the northern parcel of land.

During land fill operations vehicles transporting non – putrescible solid waste enter the waste disposal facility from Cambridge Avenue. The vehicle is weighed and the load is inspected for wastes that will not comply with the landfill's waste licence and acceptance criteria. If the waste is acceptable the load is either taken to the recycling area on the southern parcel of land or the landfill area on the northern parcel of land. After the vehicle off loads the waste the vehicle returns to the weigh bridge, is weighed then exits the waste disposal facility via Cambridge Avenue. The operation's layout is illustrated in Figure 1.2 below.

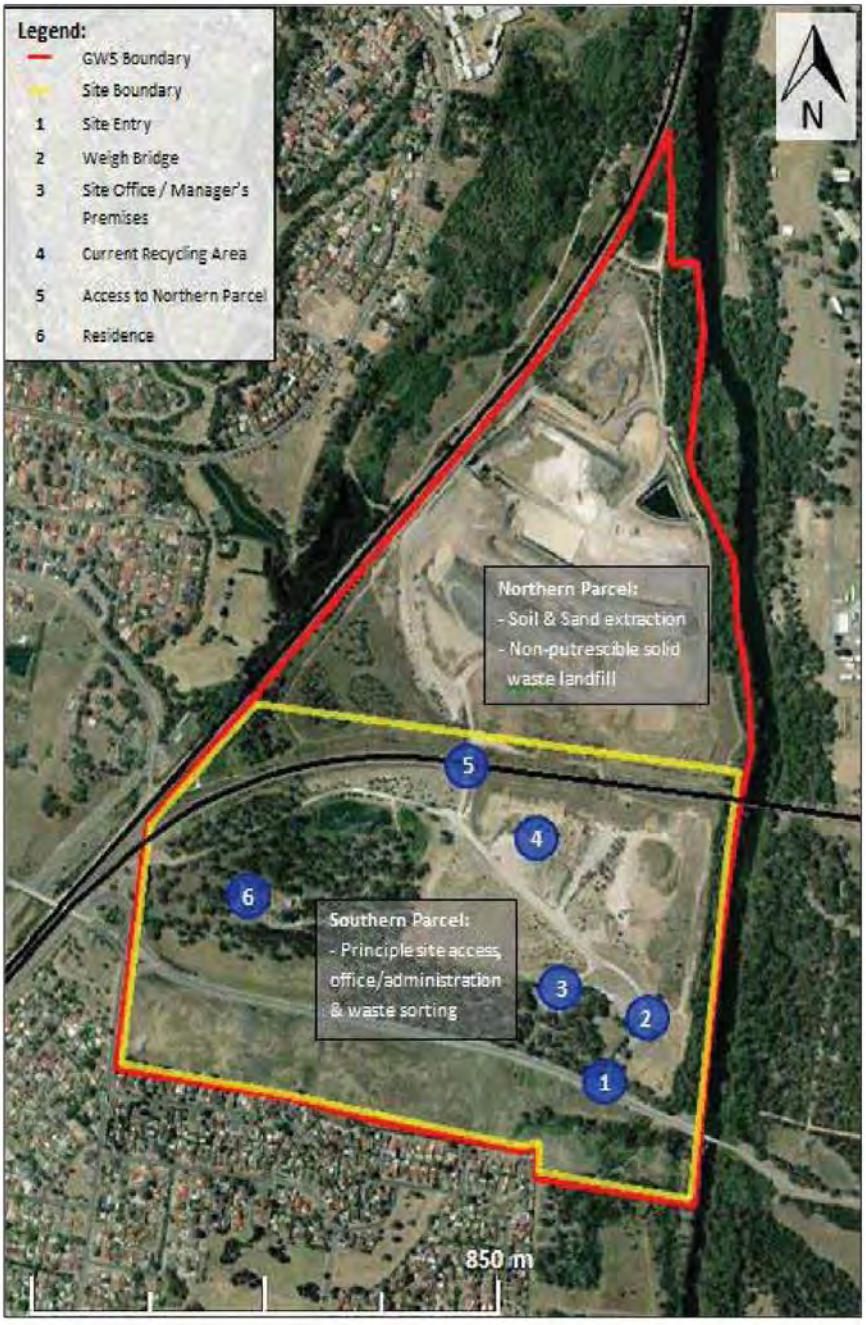


Figure 1.2: Operational Layout

Existing Zoning - Campbelltown (Urban Areas) Local Environmental Plan and the CLEP

The site is currently subject to the following plans:

1. Campbelltown (Urban Area) Local Environmental Plan 2002 (LEP 2002); and

2. The Campbelltown Local Environmental Plan 2015 (The CLEP)

The majority of the allotments that are subject to this planning proposal are included under the CLEP as a 'Deferred Matter' and as such Campbelltown (Urban Area) Local Environmental Plan 2002 (LEP 2002) is currently the principal planning instrument that applies to these allotments. The deferred areas under the CLEP are currently zoned 1(a) Rural Zone under LEP 2002. The existing zoning map under LEP 2002 is shown as Map 3.3 under Attachment 3.

The railway corridor that passes through the site, the proposed Georges River Parkway, Cambridge Avenue and the strip of open space corridor that runs adjacent to the Georges River have been assigned appropriate zones under the CLEP as shown on the Map 3.4 of Attachment 3. Those areas will maintain the current zoning under the CLEP with the exception of part of the open space corridor which is proposed to be reduced in width (from approximately 160 metres to approximately 40 to 70 metres)

Part 1 – Objectives or Intended Outcomes

The objective of the planning proposal is generally to enable the site to be developed for industrial purposes, particularly for warehousing and logistic. The southern parcel, being constrained by the electricity easement, is considered suitable to car parking purposes, subject to consultation with TransGrid.

The objectives and intended outcomes of this planning proposal are as follows:

- To enable the part of the Glenfield Waste Site located north of Cambridge Avenue, Glenfield to be developed for industrial development.

- To enable part of the regional open space that is located adjacent to the Georges River and north of Cambridge Avenue to be rezoned for industrial purposes.

- To enable the part of the site that is located south of Cambridge Avenue to be used as a private car park for vehicles with a gross vehicle mass (GVM) not exceeding 4.5 tonnes.

- To enable a parcel of land (Lot 92 DP 1155962) that is owned by Transport for NSW and located north of the railway line that passes through the site to be rezoned to Zone SP2 Railway Corridor under the CLEP to reflect the current land use of this

parcel of land. Notably this parcel is marked as a "deferred mater" under the CLEP. This parcel of land is currently zoned 'Zone 1 (a) Rural A Zone' under LEP 2002.

Proposed Land Uses

It is proposed by the applicant that the part of the site located north of Cambridge Avenue be used for industrial development with a focus on warehousing and logistics. The part of the site that is located south of Cambridge Avenue is proposed to be used for car parking purposes to service the future industrial development. However, once the land is rezoned for industrial purposes, a range of additional land uses would become permissible under the CLEP as follows:

Animal boarding or training establishments; Boat building and repair facilities; Car parks; Depots; Environmental facilities; Environmental protection works; Flood mitigation works; Freight transport facilities; General industries; Helipads; Highway service centres; Industrial retail outlets; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Mortuaries; Neighbourhood shops; Passenger transport facilities; Places of public worship; Roads; Rural industries; Rural supplies; Service stations; Sex services premises; Signage; Storage premises; Take away food and drink premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres.

Part 2: Explanation of provisions

2.1 Proposed Amendment to the CLEP

Generally, the majority of the land located north of Cambridge Avenue is proposed to be rezoned to enable industrial development, with the exception of the parcel of land owned by Transport for NSW. The land owned by Transport for NSW (Lot 92 DP 1155962) is 4460sqm in area and is currently zoned 'Zone 1 (a) Rural A Zone' under LEP 2002. This land is proposed to be rezoned to Zone SP2 Railway Corridor under the CLEP to reflect its current land use. Notably, this parcel of land is currently marked as a "deferred matter" under the CLEP.

The open space corridor that is located north of Cambridge Avenue, adjacent to the Georges River (Part of Lot 91 DP 1155962) is currently zoned Zone RE 1 Public Recreation under the CLEP. Part of this open space corridor is also proposed to be rezoned to IN1 General Industrial under the CLEP. This came about as a result of consultation with OSL in relation to a land acquisition matter.

The part of the site that is located south of Cambridge Avenue (Part Lot 3 DP 736881) and is currently zoned 1(a) Rural A Zone under LEP 2002 is proposed to be used for car parking purposes for vehicles with a maximum GVM of 4.5 tones. As such the part of this allotment is proposed to be rezoned to Zone SP2 (Car Parking) under the CLEP. Notably, this part of the allotment is currently marked as a 'Deferred Matter' under the CLEP.

The allotments comprising the subject site are shown in Table 1.

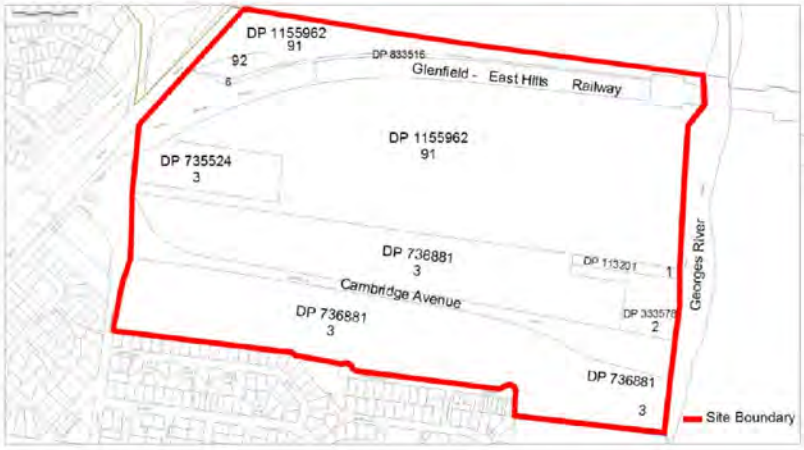


Table 1:Lots and DPs subject to this planning proposal

Lot 91 DP 1155962
Lot 3 DP 735524
Lot 92 DP 1155962
Lot 6 DP 833516 (while this allotment is part of the site, it is not proposed to vary the existing zoning of this allotment under the CLEP.
Lot 1 DP 113201
Lot 2 DP 333578
Lot 3 DP 736881

As a result of the planning proposal, a number of amendments to the CLEP's maps are proposed as follows:

a) Land application map

It is proposed to amend the Land Application Map to remove the 'deferred matter' status of the site. A copy of the existing and proposed land application maps are shown as Map 3.1 and Map 3.2 under Attachment 3.

b) Land zoning maps

It is proposed to amend the zoning map that applies to the site to reflect the intended outcome of the planning proposal. A copy of the proposed zoning map under the CLEP is shown under Attachment 3 as Proposed Zoning Map under the CLEP (Map 3.5).

c) Lot size map

It is proposed to amend the Lot Size Map so that the part of the site that is proposed to be zoned to IN1 General Industry be allocated a minimum lot size of 4000sqm, which is consistent with the minimum lot sizes for areas zoned IN1 General Industry across the LGA. A copy of the proposed lot size map under the CLEP is shown as Map 3.7 under Attachment 3.

d) Height of Buildings Map

It is proposed to amend the building height map to assign a maximum height of 12 metres for the part of the site that is proposed for industrial uses. This proposal is consistent with the building height for similar industrial development across Campbelltown LGA. A copy of the proposed height of building map is shown as Map 3.9 under Attachment 3.

e) Land Reservation Acquisition Map

It is proposed to amend the Land Reservation Acquisition Map to reflect the outcome of consultation with OSL as discussed under the History Section of this planning proposal. A copy of the existing and proposed land reservation acquisition maps are shown consecutively as Map 3.10 and Map 3.11 under Attachment 3.

Proposed additional local clause for the Glenfield Waste Site under the CLEP

A number of additional requirements became apparent as a result of the additional investigations/studies prepared for the site by the consultant, consultation with the Office of Environment and Heritage and the Department of Planning and Environment. These additional requirements include:

a) Development Control Plan/Master Plan

Prior to any future development application for industrial purposes for this site, a development control plan/master plan shall be prepared for the site that shows the internal road layout, entry points to the site, stormwater detention basins (where required) and the extent of the vegetation proposed to be cleared.

b) Flood and stormwater management plan

A detailed flood and stormwater management plan shall be prepared as part of any future development of the site.

c) Access arrangement to the site

The site shall be provided with an additional vehicle access that is flood free and satisfy the consent authority that the local road network is not adversely affected.

d) Vegetation management

Where vegetation on site is proposed to be cleared, the applicant shall implement an offsetting strategy to Council's satisfaction.

e) Restriction on the type of vehicles to use the area south of Cambridge Avenue that is proposed for car parking purposes

It is proposed to add an additional requirement under the CLEP to restrict any vehicle with a GVM mass of more than 4.5 tonnes or more from parking within the area proposed to be rezoned for car parking services. This is to ensure that this area would not be used for the parking of heavy vehicles and result in negative impacts on the adjoining residential properties.

Part 3: Justification for the Planning Proposal

Section A – Need for the Planning Proposal

Q1. Is the Planning Proposal a result of any strategic study or report?

The proposal to rezone the Glenfield Waste site was initiated by Environmental Property Services on behalf of the owner, JC & FW Kennett Pty Ltd, by lodging a rezoning request to Council. The following reports/studies have been prepared by the applicant in support of the planning proposal as required by Gateway Determination dated 9 December 2013:

1. Infrastructure Report (SMEC Urban, May 2012) (Attachment 2.1)
2. Traffic Impact Assessment (Anton Reisch Consulting Pty Ltd, October 2014) (Attachment 2.2)
3. Traffic and Transport Report, (AECOM, May 2013) (Attachment 2.3)
4. Glenfield Ecological Assessment (Environmental Property Services , updated May 2015) (Attachment 2.4)
5. Aboriginal Heritage Preliminary Assessment (Alan Williams, updated August 2014) (Attachment 2.5)
6. Contamination Land Report (Consulting Earth Scientists, May 2012) (Attachment 2.6)
7. Noise Impact Assessment (SLR Global Environmental Solutions, April 2015) (Attachment 2.7)

In addition to the above studies, a copy of the Flood Study, prepared by the then Department of Land and Water in conjunction with Liverpool Council, December 2000 is also provided as Attachment 2.8.

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

Yes. The Planning Proposal represents the best means of achieving the objectives or intended outcomes, as the current zoning of the site under LEP 2002 of 1(a) - Rural A Zone prohibits the redevelopment of land for industrial purposes.

Section B – Relation to Strategic Planning Framework

Q3. Is the Planning Proposal consistent with the objectives and actions of the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft Strategies)?

The Planning Proposal is consistent with the objectives and aims of the following Strategic Plans:

- NSW 2021 State Plan

- A Plan for Growing Sydney (December 2014)
- the draft South West Sub-regional Strategy 2007.

- **NSW 2021 State Plan**
  The Planning Proposal is consistent with the first Strategy "Rebuild the Economy" as it would provide local jobs through an industrial zoning.

- **A Plan for Growing Sydney**

  In December 2014, the NSW Government published A Plan for Growing Sydney. The Plan outlines a vision for Sydney over the next 20 years. It identifies key challenges facing Sydney including a population increase of 1.6 million by 2034 needing 689,000 new jobs and 664,000 new homes by 2031.

  In responding to these and other challenges, A Plan for Growing Sydney sets out four goals:

  1. A competitive economy with world-class services and transport;
  2. A city of housing choice with homes that meet our needs and lifestyles;
  3. A great place to live with communities that are strong, healthy and well connected; and
  4. A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources.

The Planning Proposal is not inconsistent with the above goals for the following reason:

1. The site is strategically located within close proximity to public transport.
2. The site is ideally located for industrial development because it is physically isolated from nearby residential areas.
3. The redevelopment of the site for industrial uses will provide local jobs within proximity to houses and public transport.
4. Under the draft Strategy 2031, it is anticipated that Campbelltown-Macarthur Major Centre would provide capacity for an additional 10,000 jobs by the year 2031. The proposed rezoning of the Glenfield Waste Site to enable industrial development is consistent with the draft Strategy 2031 as it will help reach this target by providing local employment opportunities.

To achieve these goals, the plan proposes 22 directions and associated actions. The Planning Proposal is consistent with the following, directions of the plan:

- Direction 1.4: Transform the productivity of Western Sydney through growth and investment
- Direction 1.7: Grow strategic centres - providing more jobs closer to home

The planning proposal will facilitate jobs within close proximity to public transport.

- **Draft South West Sub-regional Strategy 2007**

  The Draft South West Sub-Regional Strategy specifically identifies this site for further investigations as potential Employment Lands. As such this Planning Proposal is consistent with the draft South West Sub-regional Strategy.

Q4. Is the Planning Proposal consistent with Council's local strategy or other local strategic plan?

Council prepared Campbelltown Local Planning Strategy (Framework for a Sustainable Future and New Local Planning Controls, draft Local Planning Strategy). The Local Planning Strategy was considered by Council along with the then draft CELP 2013 on 26 March 2013.

The subject site has been identified by Council's Local Planning Strategy for further investigation for future industrial/employment land. As such the Planning Proposal is consistent with Council's Local Planning Strategy.

Q5. Is the Planning Proposal consistent with applicable State Environmental Planning Polices?

The planning proposal is consistent with applicable State Environmental Planning Policies. See Table 3 and Table 4 below.

Table 3: Assessment of the Planning Proposal against Relevant State Environmental Planning Policies

No.	State Environmental Planning Policies (SEPPs)	Consistency	Comments
19	Bushland in Urban Areas	Yes	Clause 10 of SEPP 19 states that: *When preparing draft local environmental plans for any land to which this Policy applies, other than rural land, the council shall:* *(a) have regard to the general and specific aims of the Policy, and* *(b) give priority to retaining bushland, unless it is satisfied that significant environmental, economic or social benefits will arise which outweigh the value of the bushland.* In this regard, the applicant undertook further studies to determine the quality of vegetation on site. Where the vegetation on site is proposed to be cleared, the applicant will be required to prepare and implement an offsetting strategy to Council's satisfaction. It is proposed that this requirement be included as part of this proposed amendment to the CLEP.

No.	State Environmental Planning Policies (SEPPs)	Consistency	Comments
44	Koala Habitat Protection	Yes	The applicant as part of the proposal to Council, submitted an Ecology Report. The applicant ecological report indicates that less than 5% of the trees that occur within the site are koala feed trees listed in schedule 2 of SEPP No 44. In particular, the site is dominated by Eucalyptus *moluccana* (Grey Box) with a few individuals of Eucalyptus *tereticornis* (Forest Red Gum), and only very few Koala feed tree present. This indicates that the site does not support potential koala habitat. A copy of this report is shown under Attachment 2.4. As such it is considered that the Planning Proposal is not inconsistent with SEPP 44.
55	Remediation of Land	Yes	The applicant submitted to Council a geotechnical and contamination rezoning report prepared by Consulting Earth Scientists (CES). The Report concludes that the site is suitable for rezoning for industrial purposes. Based on the CES report, the site is suitable to be rezoned to permit industrial land uses under the SEPP. The geotechnical and contamination report are included under Attachment 2.6 of the planning proposal.
-	SEPP (Mining, Petroleum Production and Extractive Industries) 2007	Yes	The NSW Government has recently bought back 15 Petroleum Exploration Licenses (PELs) from AGL, including PEL 2 which used to apply to the subject site. As such this SEPP no longer applies.

Table 4: Deemed State Environmental Planning Policies (Formerly Regional Environmental Plans)

No.	Deemed State Environmental Planning Policies	Consistency	Comments
9	Extractive Industry (No 2)	Yes	The deemed SEPP aims to facilitate the development of extractive resources that are in close proximity to the Sydney Metropolitan Area by identifying land which contains extractive materials of regional significance and ensuring that land is not developed for purposes that are incompatible with the extraction of that material. The site is not identified in the SEPP as having regional significance for extractive materials.
20	Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment	Yes	The aims of the Georges River deemed SEPP are to manage the natural resources of the Georges River Catchment and specifically to protect the water quality of the Georges River and its tributaries and the environmental quality of the whole catchment. The proposed rezoning will maintain an open space corridor which ranges in width between 200 to 40 metres wide between the Georges River and the site. The open space will act as a buffer between the river and the proposed development. Notably, the part of the land that is proposed to be rezoned for industrial purposes and is located beyond 40 metres from the bank of the Georges River would not have the capacity to be developed for open space because it has been subject to landfill practices as a result of the operational practices of the Glenfield Waste Recycling Facility. Council will be consulting with OEH at the development stage in terms of any necessary additional water quality control measures that may be needed (as part of the amendment to the draft CLEP) to ensure the protection of the Georges River. Clause 7.3 Riparian Land and Watercourses [local] under the provisions of the CLEP will ensure that future development will not have adverse impacts on the Georges River.

Q6. Is the Planning Proposal consistent with applicable Ministerial Directions (s 117 directions)??

The planning proposal is either considered consistent, justifiably inconsistent or the inconsistency is of minor significance with the applicable Ministerial Directions (s 117 directions). See Table 5 for an assessment of the planning proposal against the relevant Section 117(2) Ministerial Directions.

Table 5: Assessment of the Planning Proposal against the relevant Section 117(2) Ministerial Directions

Ministerial Direction	Consistent ?	Assessment
1.1 Business and industrial Zones	Yes	The Planning Proposal aims to provide for employment land within close proximity to Glenfield Station. As such it is considered consistent with the objectives of this Direction
1.2 Rural Zones	No	The proposed rezoning is inconsistent with the Direction because it proposes to rezone land from a rural zone for industrial and car parking purposes. The inconsistency with the Direction is justified by the following: – The 2007 draft South West Sub-regional Strategy 2031 identifies the Glenfield Waste Site as possibly providing employment land for light manufacturing, local industry and urban services. – The main objective of this Direction is to protect the agricultural production value of rural land. The subject site has no agricultural values, and was never used for this purpose. Accordingly, while the Planning Proposal is not consistent with this Direction, it is not inconsistent with the main objective of this Direction. Given the above, Council requests the Director General's delegate to approve the inconsistency.
1.3 Mining, Petroleum Production and Extractive Industries	Yes	The rezoning of part of the site to zone IN1 General Industrial will preserve the current permissibility of mining, petroleum production and extractive industries under SEPP (Mining, Petroleum Production and Extractive Industries) 2007. The land is not located in an identified mineral resource area. Given the above, the proposed rezoning is consistent with this Direction.
2.3 Heritage Conservation	Yes	The Direction applies whenever a relevant planning authority prepares a Planning Proposal. This Direction states that: "A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General) that: (a) the environmental or indigenous heritage significance of the item, area, object or place is conserved by existing or draft environmental planning instruments, legislation, or regulations that apply to the land, or

Ministerial Direction	Consistent ?	Assessment
		(b) the provisions of the planning proposal that are inconsistent are of minor significance. The Planning Proposal is consistent with the Direction for the following reasons: – Clause 5.10 Heritage Conservation of the CLEP specifically requires Council's consent for *'disturbing or excavating a place of Aboriginal place of heritage significance'* As such the current provisions under the CLEP are considered sufficient to ensure the protection of the aboriginal heritage of the site prior to land being disturbed. – No European Heritage items are listed and described in Schedule 5 Environmental Heritage of the CLEP. – A preliminary Aboriginal Heritage Assessment was conducted by AHMS. The final AHMS report provided with the Planning Proposal concludes there are no Aboriginal heritage issues that indicate the rezoning of the site from rural to industrial should not proceed; – The potential Aboriginal objects/sites identified in the AHMS report will not be disturbed or moved as part of the rezoning process and therefore an Aboriginal Heritage Impact Permit (AHIP) is not required at this stage. – At the development application stage, the applicant will be required to undertake further investigation, if any part of the site that was identified with potential aboriginal heritage significance is proposed to be disturbed or excavated by future work.
3.4 Integrated Land Use and Transport	Yes	This direction applies when a relevant planning authority prepares a planning proposal that will create, alter or remove a zone or a provision relating to urban land, including land zoned for residential, business, industrial, village or tourist purposes. A planning proposal must locate zones for urban purposes and include provisions that give effect to and are consistent with the aims, objectives and principles of: (a) Improving Transport Choice – Guidelines for planning and development (DUAP 2001), and (b) The Right Place for Business and Services – Planning Policy (DUAP 2001). The proposed rezoning is consistent with principles of Improving Transport Choice – Guidelines for planning and development (DUAP 2001), and The Right Place for Business and Services – Planning Policy (DUAP 2001) and therefore with the Direction for the following reasons: – The site is within a walking distance (approximately 1.0km) from the Glenfield Railway Station. – The site is located on two local bus service routes accessing the Glenfield railway station; – The site adjoins the Liverpool – Campbelltown bus corridor

Ministerial Direction	Consistent ?	Assessment
		(Corridor 31) identified in the South West Subregion Strategy as a strategic bus corridor; – Less than 45% of all workers in the South West Subregion live and work within the subregion. The rezoning of part of the site for employment lands will contribute to providing employment opportunity in the South West Subregion reducing travel demand including the distances travelled by employees; – The rezoning of part of the site for employment lands will contribute to meeting the future employment land requirements for the South West region and for the Campbelltown LGA. – AECOM on behalf of the proponent prepared a traffic and transport desktop review. The following findings are relevant to Pedestrial and cycle facilities: – The site is well located in terms of opportunities for cycling, being located close to the Liverpool-Parramatta Rail Trail and the M7 Motorway Cycleway. Together these cycleways provide approximately 60km of cycleways through Western Sydney. – There is a low provision of pedestrian facilities in the vicinity of the site. The Georges River and the Holsworthy Barracks act as a natural barrier to walking at the eastern end of the site. However, Glenfield Station and the local shops are located within an approximately 15 to 20 minute walk from the site. – The site has good connectivity and direct access to Sydney's Motorway Network and the surrounding sub-arterial road network; – Capacity on the local road network with the flexibility of upgrading the local road network to cater for some future traffic growth; – Access to regional cycleway infrastructure that provides a sustainable alternative mode of travel.
4.2 Mine Subsidence and Unstable Land	Yes	The subject site is not within a proclaimed mine subsidence area. The proposed rezoning of the site will preserve the current permissibility of mining, petroleum production and extractive industries under SEPP (Mining, Petroleum Production and Extractive Industries) 2007. Given the above, the proposed rezoning is consistent with this Direction.
4.3 Flood Prone Land	No	This Direction applies because a small area of the site that is adjacent to the Georges River and near the entrance of the site (adjacent to Cambridge Avenue bridge) is flood prone land and the Planning Proposal is proposing to rezone part of the site from a rural zone to an industrial zone. The most detailed and recent flood study that includes the site is the Upper Georges River Flood study prepared by the Department of Land & Water Conservation in conjunction with the Liverpool City Council in

Ministerial Direction	Consistent ?	Assessment
		December 2000. A copy of this study is included under Attachment 2.8 of the planning proposal. Hard and Forester Surveyors reproduced the study's flood levels for the site onto a topographic map that shows the area impacted in a 1 in 100 year flood. A copy of this map is shown under Attachment 2.9 of this planning proposal. This survey map shows that, with the exception of the riparian corridor and a small area adjacent to Cambridge Avenue at the south eastern corner of the site, the site is not subject to a 1 in 100 year flood. Any development of the site will take into consideration the 1 in 100 year flood. The site currently has two access points. It is proposed that an additional access point be created from Cambridge Avenue to service the future industrial developments at the site. This third access point is proposed from Cambridge Avenue at approximately half way through the site and as such will be flood free. Therefore, the proposed rezoning's inconsistency with the Direction can be justified as of minor significance for the following reasons: • Only a very small portion of the site is susceptible to a 1 in 100 year flood event; • The 1 in 100 year flood event will not prevent development of the site; • An additional third access to the northern part of the site that is not flood affected is proposed from Cambridge Avenue. • The Glenfield Waste site's 1 in 100 year flood level is based on the comprehensive Upper Georges River Flood Study 2000 (the study) prepared by the previous Department of Land and Water Conservation in conjunction with Liverpool City Council; • The area for the study was 6.5 km of the river between the Liverpool weir and the confluence with the Bunburry Curran tributary, which drains the urban area of Campbelltown; • The Georges River is deeply incised with little or no floodplain; • The study provides for design flood events with a probability of occurrence of 1 in 20 years, 1 in 50 years, 1 in 100 years and an estimate for an extreme flood event; • The Hard and Forester survey maps show, except for the current access to the site, the site is not susceptible to a 1 in 100 year flood event; • Any future industrial development of the site will be outside the 1 in 100 year flood event; and • Further detailed flooding and a stormwater management plan will need to be prepared for the site at the subdivision stage to ensure that the redevelopment of the site would not impact flooding on or off the site.

Ministerial Direction	Consistent ?	Assessment
		• Council's Technical Services section advised that the potential flood issues onsite will be able to be resolved at development application stage, but may require more mitigation works than normally expected. The option to drain the water directly to Georges River where possible should be encouraged. Given the above, Council requests the Director General's delegate to approve the inconsistency as a minor significance.
4.4 Planning for Bushfire Protection	Yes	The Bushfire Prone Map for the Campbelltown area identifies that part of the site has Vegetation Category 2 and Vegetation Buffer, as illustrated on the Bushfire Prone Map under Attachment 2.10 of the planning proposal. Council will ensure that any future local development of the site will comply with the current bushfire protection measures specified by the Planning for Bushfire Protection Guidelines 2006. Council considers the proposed rezoning to be consistent with this direction.
6.2 Reserving Land for Public Purposes	Yes	The objectives of this direction are: (a) to facilitate the provision of public services and facilities by reserving land for public purposes, and (b) to facilitate the removal of reservations of land for public purposes where the land is no longer required for acquisition. Consultation with OSL resulted in reducing the width of the open space corridor given that this part of the land has been subject to landfill. OSL indicated that they have no objection to the proposed zoning in relation to land acquisition matters.
7.1 Implementation of A Plan for Growing Sydney	Yes	The proposed rezoning of part of the site currently Zone 1(a) – Rural A Zone under LEP 2002 to the Zone IN1 General Industrial under the CLEP is consistent with the NSW Government's A Plan for Growing Sydney as it would provide employment land and create much needed local jobs within the Campbelltown LGA.

Section C – Environmental social or 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?

Environmental Property Services (EPS) was engaged by landowners JC & FW Kennett P/L & Figela P/L to prepare an Ecological Assessment Report (EA) for Glenfield Waste Services (GWS). This EA was prepared to provide a detailed assessment of the ecological characteristics of the GWS's southern parcel of land located in the Campbelltown LGA including the presence and/or likelihood of occurrence of threatened flora and fauna and their habitat.

As a result of consultation with the Office of Environment and Heritage, the applicant has undertaken additional flora and fauna assessment and updated the study accordingly.

The additional information in relation to flora and fauna has been prepared by the applicant in consultation with Council's officers and the Office of Environment and Heritage (OEH).

In November 2014 an additional Bio Banking Credit Assessment (Field Work Report), including an EPBC Act Cumberland Plain Shale Woodlands Assessment were prepared by SLR Consulting Australia Pty Ltd for the Glenfield Site. The biodiversity offset is proposed to provide compensation for the impacts to the Cumberland Plain Woodland.

The main findings of the above studies are as follows:

- The subject site supports vegetation that meets the criteria for Cumberland Plain Shale Woodlands, which is listed as critically endangered under the Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act).
- Threatened microchiropteran and megachiropteran bats species were recorded during the targeted surveys being Pteropus poliocephalus (Grey-headed Flying-fox), Saccolaimus flaviventris (Yellow-bellied Sheathtail-bat), Mormopterus norfolkensis (East-coast Freetail-bat), Miniopterus australis (Little Bentwing bat) and Miniopterus schreibersii oceanensis (Eastern Bentwing bat)
- No threatened frog, waterbird, arboreal mammal, or fish species were identified during surveys and are considered unlikely to occur on the investigation area;
- The investigation area supported a farm dam which provided an area of open, deep water for common waterbird species;
- The investigation area supported a relatively high number of hollow bearing trees.

Further consultation with Commonwealth Department of the Environment the Department of Planning & Environment and the Office of Environment and Heritage at the subdivision stage

would be required to determine the best pathway for providing the best possible ecological outcomes for the site.

The additional information provided by the applicant in relation to flora and fauna is considered sufficient for the rezoning stage and will be placed on public exhibition as part of the planning proposal. However, it is considered important that the amendment to the CLEP include a specific requirement for a detailed biodiversity offset strategy to be prepared as part of any development application for the site that proposes to remove any of the vegetation on site.

Given that the site contains critically endangered vegetation, it is recommended that while the planning proposal is on public exhibition, Council formally consult with the Chief Executive of the Office of Environment and Heritage as required by Section 34A (Special Consultation Procedures Concerning Threatened Species) of the Environmental Planning and Assessment Act 1979.

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

The environmental matters that require consideration and how they are proposed to be managed are outlined below:

Acoustic Amenity

The part of the site that is proposed to be zoned for industrial purposes is ideally located away from residential areas. The area south of Cambridge Ave will provide a buffer between residential areas to the south and future industrial uses to the north.

SLR has undertaken a noise assessment relating to the proposed rezoning of the southern parcel of the GWS site located at Cambridge Avenue, Glenfield NSW (Attachment 2.7).

The aim of this assessment is to assess the potential noise impacts from land use changes associated with the rezoning on surrounding sensitive receptors.

Predicted noise emission levels for a hypothetical industrial estate are predicted to comply with the relevant noise goals during day, evening and night-time periods at all existing residential locations considered under calm and prevailing weather conditions. Furthermore, no specific noise mitigation measures, besides the existing mound and fence, have been included in the noise model. It is possible that actual noise emissions from the proposed industrial estate would be less than those predicted.

Predicted noise levels could be greatly reduced with judicious planning along with the use of equipment incorporating 'quiet' engineering design, the addition of acoustically designed enclosures, noise barriers or using management techniques. It is also possible that considerable screening of acoustically significantly activities would be provided by buildings once the site is developed.

Stormwater management and flooding

The site's large pervious surface area allows the majority of the rain to infiltrate into the ground.

Any future development will increase the impervious surfaces areas e.g. roads, buildings, compacted soil that will increase the site's runoff.

The site's developable area has a north south crest running through the area. Approximately 25% of the site's developable area falls towards the northwest i.e. the East Hills Rail Line while the remainder generally falls towards the northeast i.e. the Georges River.

The future stormwater system for the site's developable area falling towards the northeast will be designed to discharge to the Georges River.

Discharging the stormwater from the site's developable area, of approximately 25%, that falls towards the northwest i.e. the East Hills Rail Line raises the following issues as identified in Global Arc's Glenfield Transport Interchange Flooding Assessment Concept Report December 2008 (Arc's report):

- There is an existing culvert (culvert 1) located at rail chainage 31,660km (East Hills) that connects upstream to the overflow of a wet detention basin located within that part of the Glenfield waste disposal site located in the Campbelltown City Council LGA that flows under the existing East Hills railway line before heading north-east along the Main South railway line until it crosses over via a culvert downstream to Glenfield Creek;
- Culvert 1 size is 2 x 1300mm reinforced concrete pipe (RCP);
- The South Sydney Freight Line (SSFL) works will require culvert 1 to be extended and the realignment of an existing unlined open drain;
- As part of the stormwater drainage system upgrade for the Glenfield Interchange a culvert (culvert 2) located at rail chainage 32,000km (East Hills) and an existing outlet will require connection into an open drain alongside the new East Hills line embankment that will then flow into culvert 1. Culvert 2 captures local contributing flows from Cambridge Avenue and Canterbury Road entering a letter box style pit located at the end of the Canterbury Road reserve. The existing flows head north-east and connect up to the outflow from culvert 1.

The capacity of culvert 1 to manage any development stormwater will be determined with reference to the final development plans for the developable area and final culvert specifications/installation for the Glenfield interchange and SSFL upgrades.

In the event some or all of the site's developable area that falls towards the northwest cannot be discharged in a northwest direction the stormwater will be pushed towards and connected into the stormwater system for the site's developable area falling towards the northeast i.e. the Georges River.

A stormwater management system for any development on the site will be prepared having regard to the flood affectation on the site's boundary with the Georges River.

Flood and Stormwater management will include assessment of hydrological impacts of the development, flood management and mitigation measures, water quality management, accident spill management measures and water cycle management.

Stormwater management is not considered an impediment to the rezoning of the site, as a Stormwater system can be designed and engineered to discharge to the Georges River.

More detailed engineering design for Stormwater management will be required as part of any future development application for the site.

Land contamination and soils

The applicant has submitted to Council a Desktop Geotechnical & Contamination Rezoning Report, prepared by a consultant (Consulting Earth Scientists, April 2012) on behalf of the applicant, as shown under Attachment 2.6 of the planning proposal.

None of the findings of the report indicate that the subject land is not suitable for rezoning for industrial purposes, or for subsequent subdivision and development of individual lots for appropriate industrial activities.

Traffic, transport and access

AECOM on behalf of the applicant prepared a preliminary Traffic and Transport Review of the subject site (refer to Attachment 2.3 of this Planning Proposal).

The findings of the review indicates that the site would appear to be appropriate for 'Zone IN1 General Industrial' from a transport perspective, subject to further detailed traffic impact assessment to determine the capacity of the existing network and identify the extent of required infrastructure improvements

The site currently has two access points. It is proposed that an additional access point be created from Cambridge Avenue to service the future industrial developments at the site.

In addition to the preliminary Traffic and Transport Review prepared by AECOM, Anton Reisch Consulting Pty Ltd prepared a detailed Traffic Impact Assessment on behalf of the applicant to appropriately assess the potential traffic and transport impacts arising from the Proposal. Following is a dot point summary of the findings of this study:

- In the AM [commuter peak hour 7:00am – 8:00am] the Site trip generation is estimated at 265 vehicle trips per hour (vph), and in the PM [commuter peak hour 4:00pm – 5:00pm] the Site trip generation is estimated at 275vph;
- The Site provides 2 existing access points to the local road network, via GWS Road 1 to Cambridge Avenue; and via GWS Road 2 to Railway Parade . The intersection of GWS Road 1 & Cambridge Avenue currently provides primary access to the Site, but the volume of additional trips generated by the Proposal – along with upgrade constraints at the intersection of GWS Road 1 & Cambridge Avenue – dictates that a new intersection be provided to Cambridge Avenue to service the rezoned land.
- The Proposal would have only a very moderate impact on the road network through to the year 2024.

Heritage

Archaeological and Heritage Management Solutions Pty Ltd (AHMS) prepared an Aboriginal Heritage Preliminary Assessment Report (AHPA Report) for the rezoning of the site a copy of which is shown under Attachment 2.5. The Assessment report was undertaken in accordance with the Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation, (DEC, 2005), and the Code of Practice for Archaeological Investigations of Aboriginal Objects in New South Wales (DECCW, 2010), and Aboriginal Cultural Heritage Community Consultation Requirements for Proponents (DECCW, 2010) as specific best practice standards and processes for Aboriginal heritage assessment in NSW.

Aboriginal consultation was undertaken in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (April 2010). The Registered Aboriginal Parties for the project are the Tharawal Local Aboriginal Land Council, Cubbitch Barta Native Title Claimants Aboriginal Corporation, Darug Aboriginal Cultural Heritage Assessments, Darug Aboriginal Landcare, Darug Custodian Aboriginal Corporation, Darug Land Observations, Peter Falk Consultancy, and Tocomwall.

Findings of the AHPA Report

- Most of the subject area is heavily disturbed and/or previously developed, and the potential for preservation of archaeological materials is low. However, two areas appear to be less disturbed: an area of bushland in the western half of the subject area; and an alluvial terrace adjacent to a minor tributary of the Georges River, in the south-eastern corner of the subject area.

- Four archaeological sites were identified within the subject area:

1. Glenfield 1 (#45-5-3531): a registered site located on a track currently in use in association with the ongoing railway expansion. It is considered likely that this site is destroyed.
2. GWD 3: an isolated artifact: found to be of low value
3. GWD 4: an isolated artifact: found to be of low value
4. GWD 2: a potential archaeological deposit located on a large alluvial terrace on the bank of the Georges River, encompassing a minor tributary.

- Two further sites were initially identified, but following further investigation have been subsequently rejected as of Aboriginal origin. These were:

  1. Glenfield ST (#45-5-2428): a registered site consisting of a scarred tree. It is considered that the scar is of natural rather than cultural origin.

  2. GWD 1: a scarred tree. It is considered that this scar is of natural rather than cultural origin.

- Responses from the Aboriginal community supported the findings and recommendations of earlier versions of this report, and provided no specific cultural values to the Aboriginal objects/sites identified through the assessment. The area was considered to have been significant to Aboriginal people in the past given the proximity of Georges River –an important resource – and recommendations on signage outlining the Aboriginal history of the area were proposed

The majority of GWD 2, is zoned RE1 Public Recreation under the CLEP and SP2 Road, and this planning proposal does not seek to vary those zones. Part of this site is currently zoned 1(a) Rural under LEP 2002 and is proposed to be rezoned SP2 Car Park for car parking purposes. Any future car park within this site must be located to minimise any disturbance to aboriginal heritage.

Additional characterisations of the GWD 2 deposit should occur at the development stage. Notably, an AHIMS site card for the GWD 2 area has been completed and lodged with the AHIMS registrar ensuring the GWD 2 area will be identified at the development stage.

In this regard, Council will further be consulting with the aboriginal communities, and seek their views on this matter while the planning proposal is placed on public exhibition.

Q 9 How has the rezoning submission adequately addressed any social and economic effects?

The Planning Proposal would enable the majority of the site to be developed for industrial development, thus creating much needed local jobs within Campbelltown LGA and assists Council to meet its employment targets.

It is not expected that the proposal would have any adverse effects on social or economic values of the Campbelltown community.

Section D – State and Commonwealth interests

Q 10 Is there adequate public infrastructure for the planning proposal?

The applicant submitted to Council an Infrastructure Report. The report confirmed that all major utility services are currently within the vicinity of the subject site. Given the area of land proposed for rezoning, consultation with Sydney Water and Endeavour Energy will identify the likely future utility requirements for the site.

The volume of additional trips generated by the Proposal dictates that a new intersection will need to be provided to Cambridge Avenue to service the rezoned land.

O 11 What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway determination?

Condition 5 of the revised Gateway Determination dated 9 December 2014 required Council to consult with the following public authorities under section 56(2)(d) of the EP&A Act and/or to comply with the requirements of relevant S117 Directions:

- Transport for NSW
- Railcorp
- Sydney Water
- Telstra
- Transgrid
- Sydney Catchment Authority
- Sydney Metropolitan Catchment Management Authority
- Office of Environment and Heritage
- NSW Department of Primary Industries -Agriculture
- NSW Trade and Investment - Minerals and Petroleum (S117 Direction 1.3 Mining,Petroleum Production and Extractive Industries)
- NSW Rural Fire Service (S117 Direction 4.4 Planning for Bushfire Protection)
- Office of Strategic Lands regarding the dedication of land, which adjoins the eastern boundary of the subject land and which is zoned 6(b) Regional Open Space under Campbelltown (Urban Area) LEP 2002, and its removal from the Land Reservation Acquisition Map.
- Adjoining LGAs

To date Council has consulted with the following public authorities:

1. **Transport for NSW**

Council consulted with Transport for NSW in relation to the proposed rezoning of Lot 92 DP 1155962 (owned by Transport for NSW).

No official/written response has yet been received from Transport for NSW, however verbal advice indicated that there is no objection to the proposed rezoning. Council will consult again with Transport for NSW while the proposal is on public exhibition.

2. Office of Environment and Heritage

Council consulted with the Office of Environment and Heritage in relation to the required flora and fauna study and the Preliminary Aboriginal Heritage Study.

The applicant undertook additional surveys and studies as required by Council and the Office of Environment and Heritage. Council is satisfied that the additional information provided by the applicant is sufficient for the rezoning stage. Additional work and consultation with OEH should occur at the development application stage in relation to aboriginal heritage and the management of vegetation on site. Council will consult with OEH again, while the planning proposal is on public exhibition.

3. Office of Strategic Lands

As part of the preparation of the draft Campbelltown Local Environmental Plan 2014, Council consulted with the Office of Strategic Lands to resolve matters related to the future acquisition of land zoned RE1 Public Open Space adjacent to the Georges River and the site subject to this planning proposal.

Council received the OSL submission which in relation to the subject strip of land stated:

> Following discussion with GWS and a subsequent site visit it is our view that the width of regional open space be reduced. The primary factor for this request is that a large percentage of the current open space reservation is on landfill with ongoing waste material monitoring conditions on the land owner. The ongoing responsibilities for this should remain with GWS. The site and its value as a future regional open space corridor has been so compromised that the intent behind the reservation cannot be achieved. It is more realistic and pragmatic that the regional open space zoning be for a width of approximately 70 m from the Georges River as this reflects the width of unaffected land from landfill and will serve both a riparian zone and pedestrian/cycleway function in the future.

The applicant, in consultation with the OSL has prepared a survey to precisely inform the boundaries of the part of the site to be acquired by OSL. The land to be acquired by OSL is zoned RE1 Public Recreation under the CLEP. The remaining part of the open space corridor is proposed be rezoned to industrial zone (refer to Part 4 Maps) for maps showing the proposed rezoning of the site and the Land Reservation Acquisition map.

4. NSW Roads and Maritime Services

Council has consulted with NSW Roads and Maritime Services (RMS) in relation to the scope of the traffic impact assessment. Council received a written email in relation to the matters that need to be addressed by the traffic impact assessment. The applicant has prepared a traffic impact assessment taking into consideration feedback from RMS and Council's Engineers.

Notably, Council will consult with all relevant public agencies listed under the gateway conditions of the revised Gateway Determination during the public exhibition of the draft Planning Proposal.

Part 4: Mapping

The Planning Proposal is accompanied by the following relevant maps shown as Attachment 3 to this Planning Proposal:

Map 3.1 Location Plan of the Subject Site

Map 3.2 Aerial Photo of the Subject Site

Map 3.3 Existing Zoning Map under LEP 2002

Map 3.4 Existing Zoning Map under the CLEP

Map 3.5 Proposed Zoning Map under the CLEP

Map 3.6 Existing Lot Size Map under the CLEP

Map 3.7 Proposed Lot Size Map under the CLEP

Map 3.8 Existing Height Map under the draft CLEP

Map 3.9 Proposed Height of Buildings Map under the CLEP

Map 3.10 Existing Land Reservation Acquisition Map under the CLEP

Map 3.11 Proposed Land Reservation Acquisition Map under the CLEP

Map 3.12 Survey Plan Map – Boundary Adjustment

Part 5 - Community Consultation

Public consultation will take place in accordance with the revised Gateway Determination made by the Minister for Planning and Infrastructure in accordance with Sections 56 & 57 of the Environmental Planning & Assessment Act 1979.

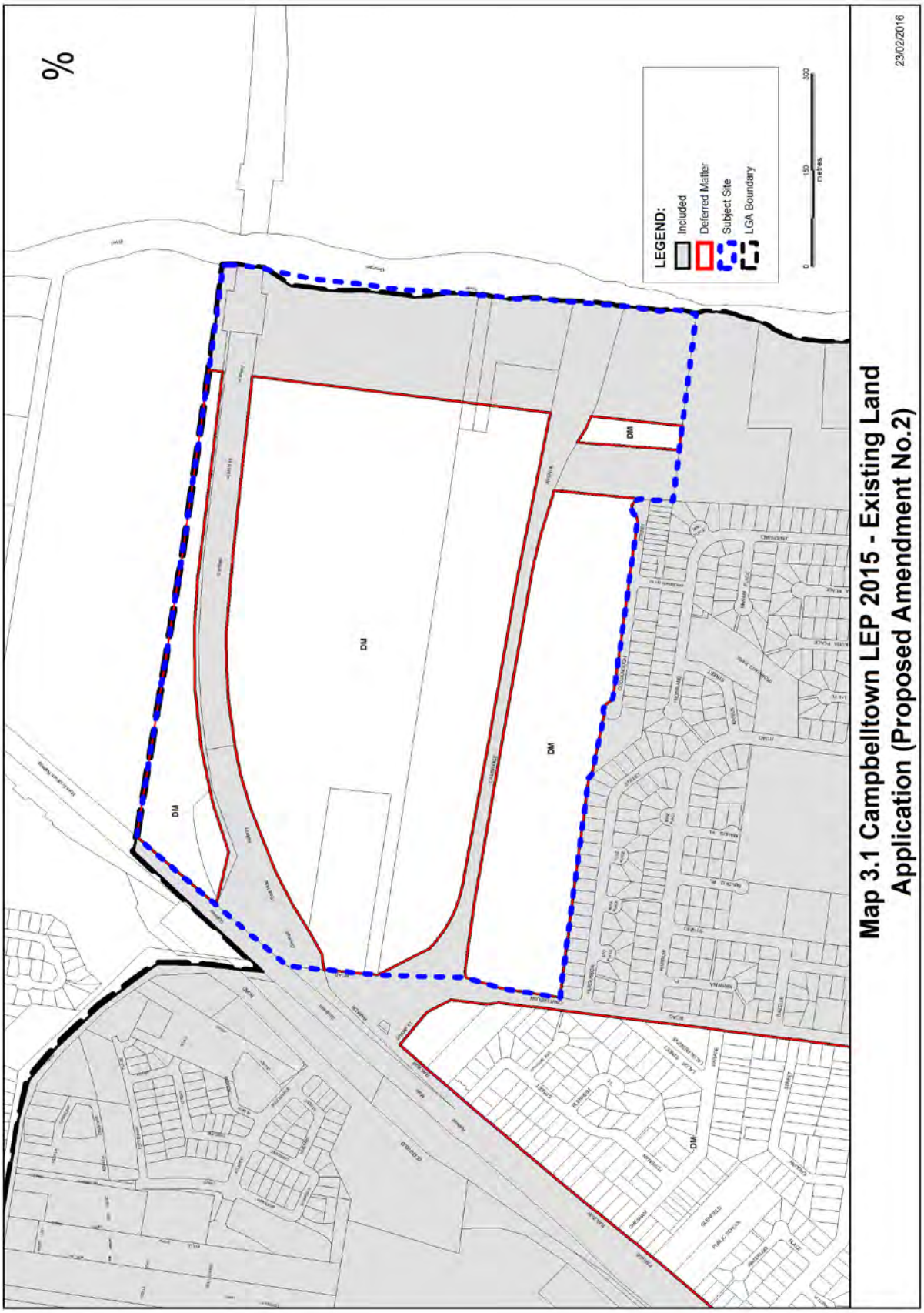
Part 6 - Project Timeline

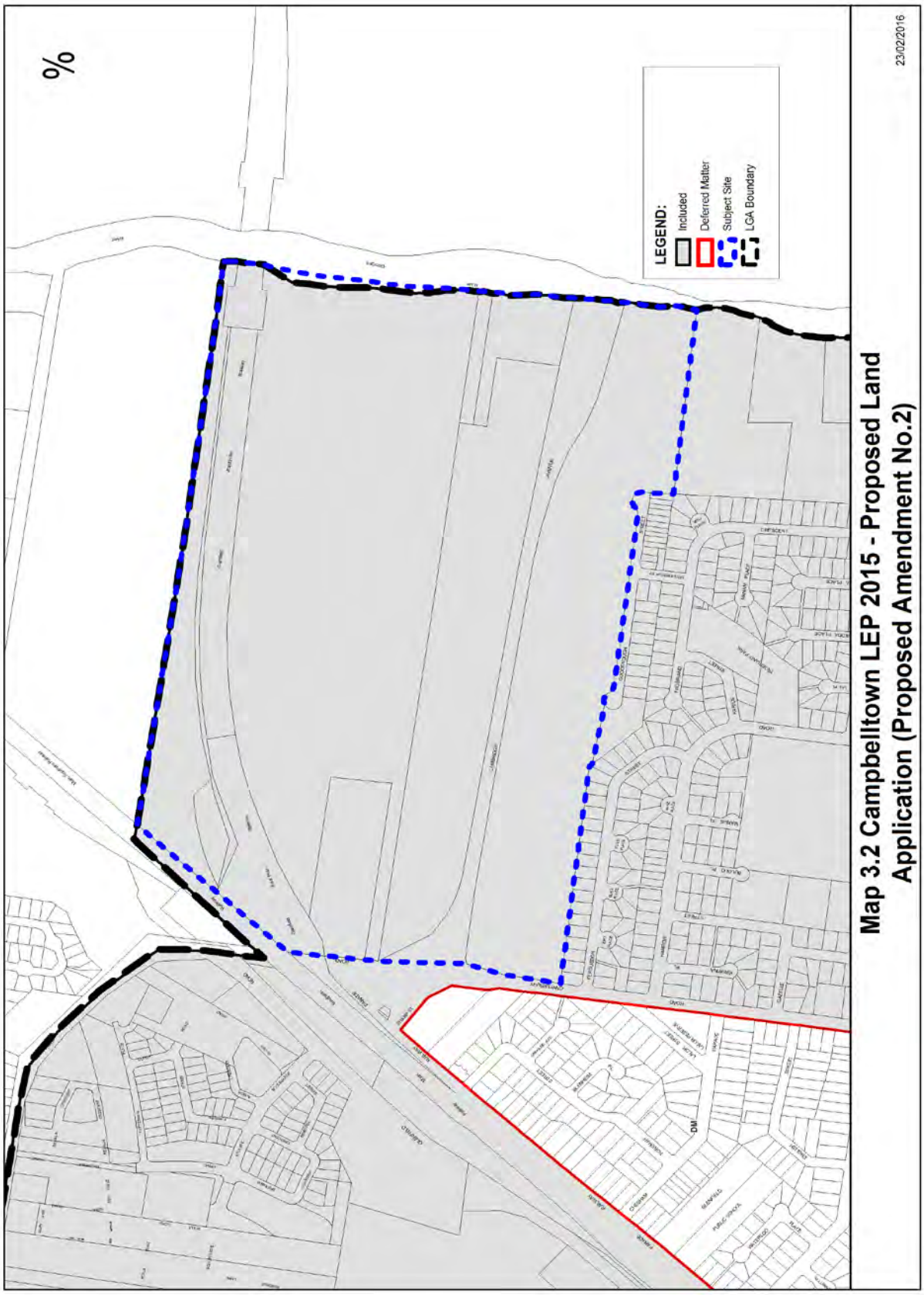
The draft project timeline has been included in Table 6 below. The anticipated timeframes and

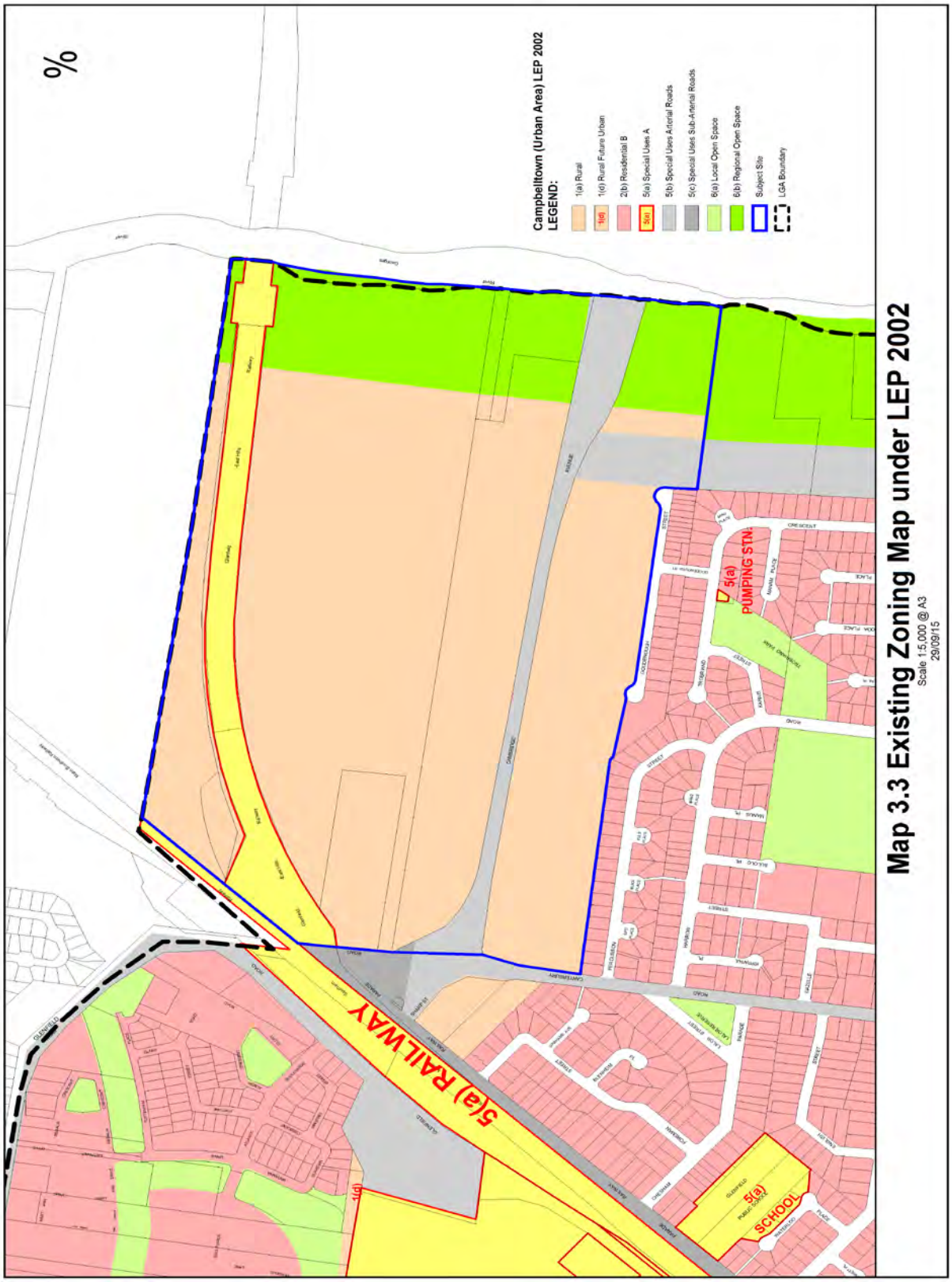
Milestone	Date
– anticipated timeframe for the completion of required technical information	Completed June 2015
– anticipated commencement date (date of revised Gateway determination)	February 2015
– commencement and completion dates for public exhibition period	April 2016
– timeframe for government agency consultation (pre and post exhibition as required by Gateway determination) – Consultation with government agencies is proposed to be undertaken while the proposal is on public exhibition.	May 2016
– timeframe for consideration of submissions (report to Council)	June 2016
– date of submission to the department to finalise the LEP	August/September 2016

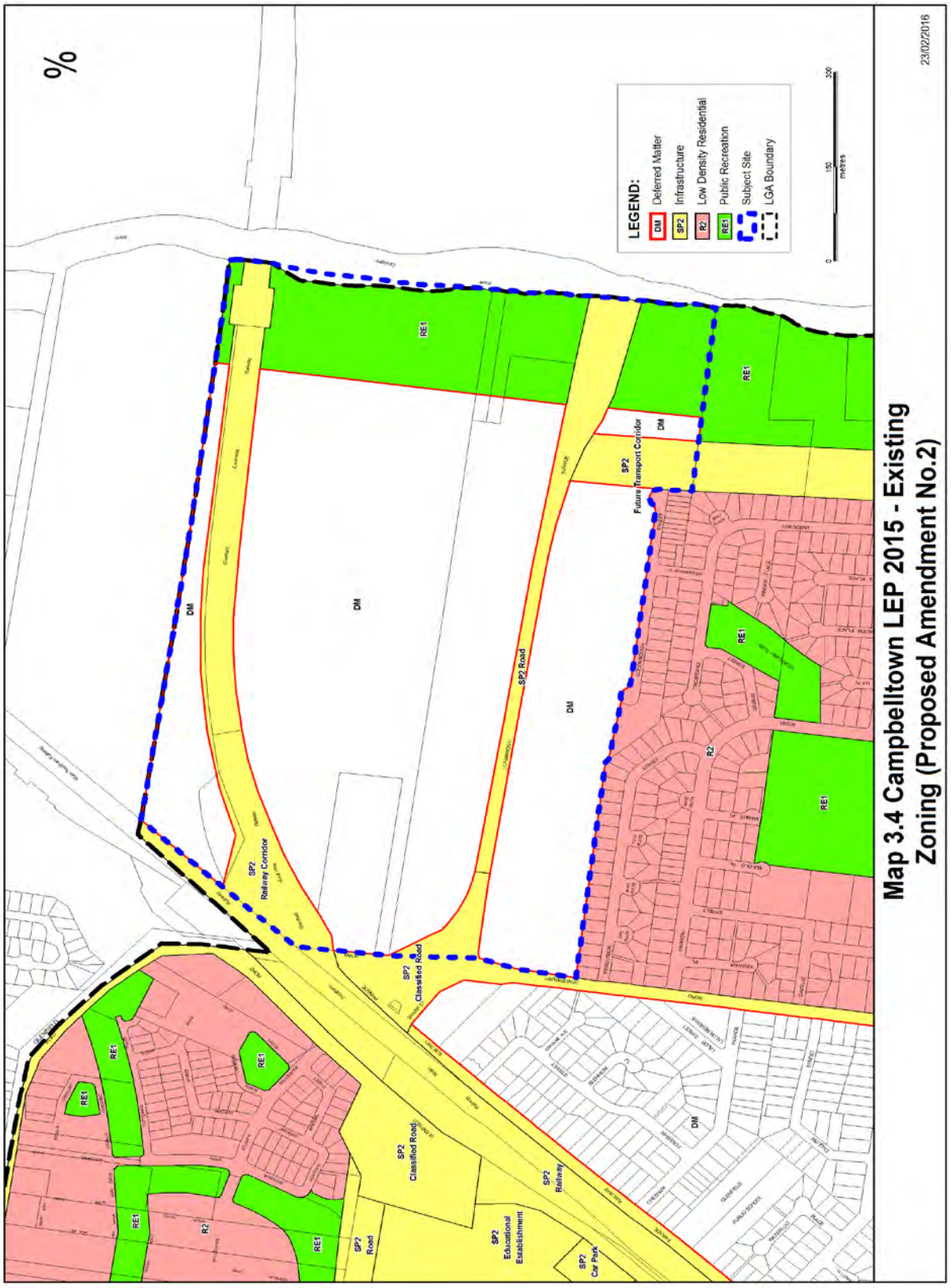
dates have been assigned to each milestone of the Gateway process.

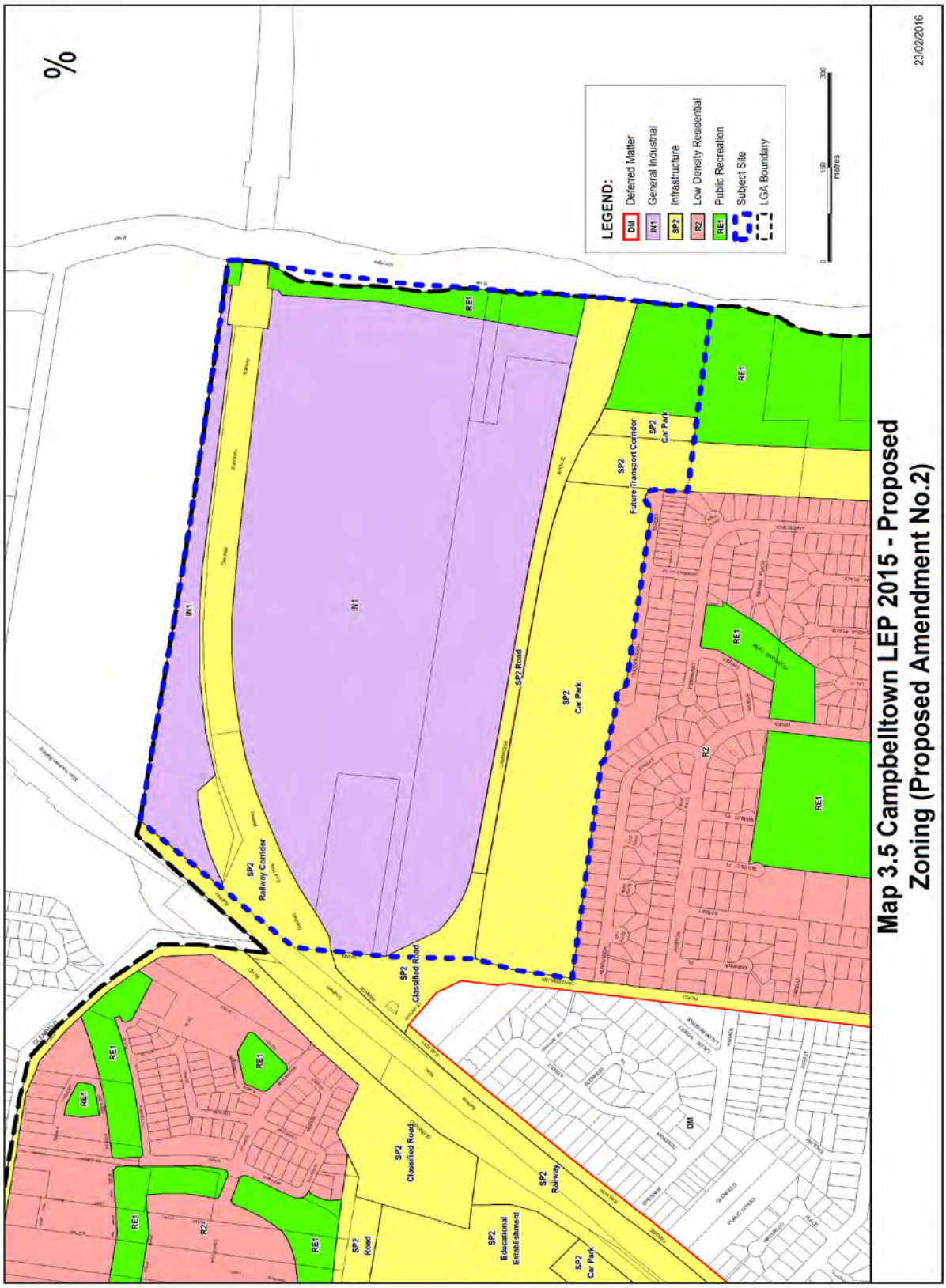
Table 6: Project Timeline


%
LEGEND:
Included
Deferred Matter
Subject Site
LGA Boundary
0
150
300
metres
DM
DM
DM
DM
23/02/2016
Map 3.1 Campbelltown LEP 2015 - Existing Land Application (Proposed Amendment No.2)

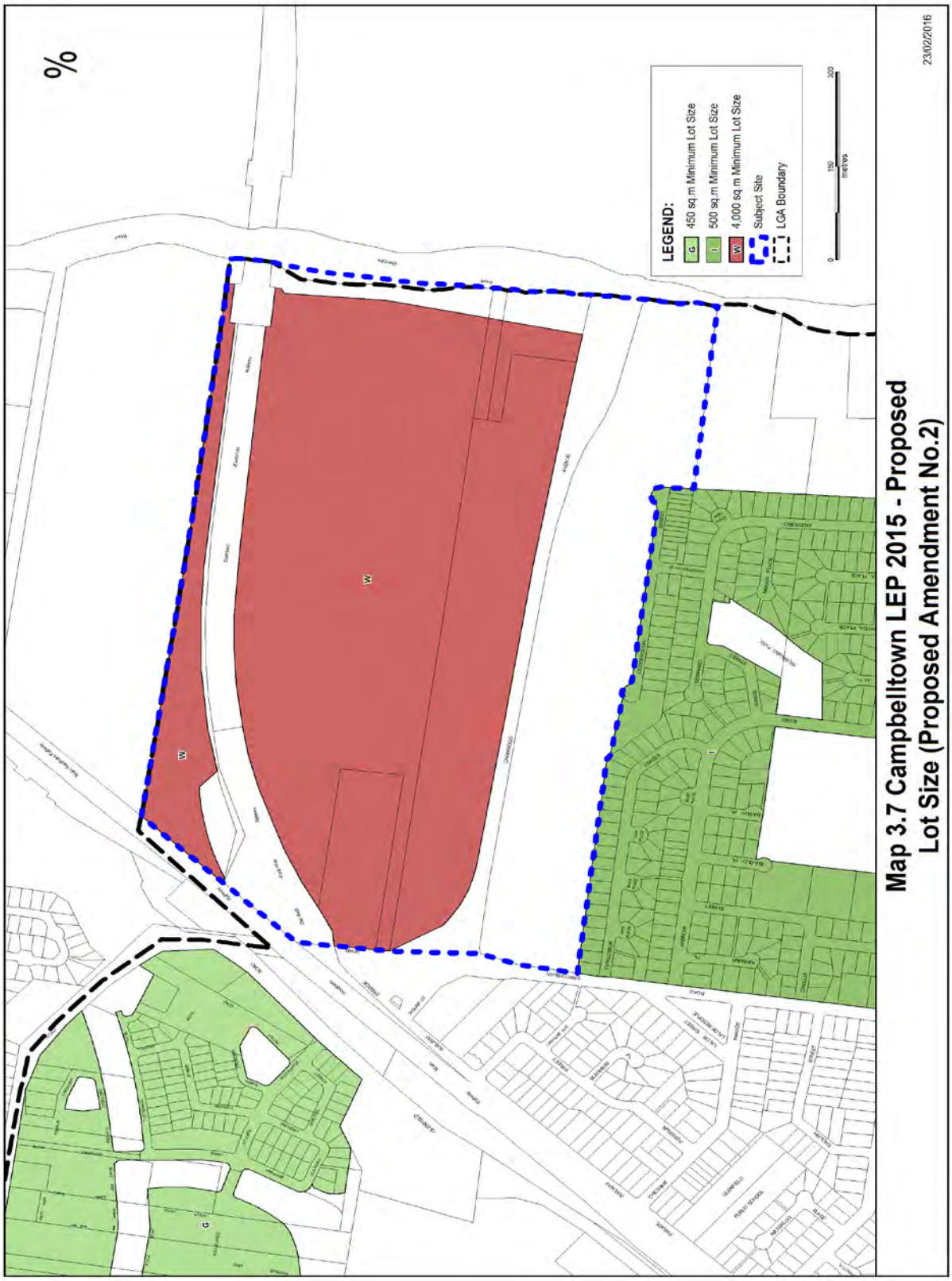

%
LEGEND:
Included
Deferred Matter
Subject Site
LGA Boundary
23/02/2016
Map 3.2 Campbelltown LEP 2015 - Proposed Land Application (Proposed Amendment No.2)


Campbelltown (Urban Area) LEP 2002
LEGEND:
1(a) Rural
1(d) Rural Future Urban
2(b) Residential B
5(a) Special Uses A
5(b) Special Uses Arterial Roads
5(c) Special Uses Sub-Arterial Roads
6(a) Local Open Space
6(b) Regional Open Space
Subject Site
LGA Boundary
5(a) PUMPING STN
5(a) RAILWAY
5(a) SCHOOL
Map 3.3 Existing Zoning Map under LEP 2002
Scale 1:5,000 @ A3
29/09/15


Map 3.4 Campbelltown LEP 2015 - Existing Zoning (Proposed Amendment No.2)
23/02/2016
LEGEND:
Deferred Matter
Infrastructure
Low Density Residential
Public Recreation
Subject Site
LGA Boundary
DM
SP2
R2
RE1
0
150
350
metres
SP2 Future Transport Corridor
SP2 Road
SP2 Railway Corridor
SP2 Classified Road
SP2 Railway
SP2 Educational Establishment
SP2 Car Park

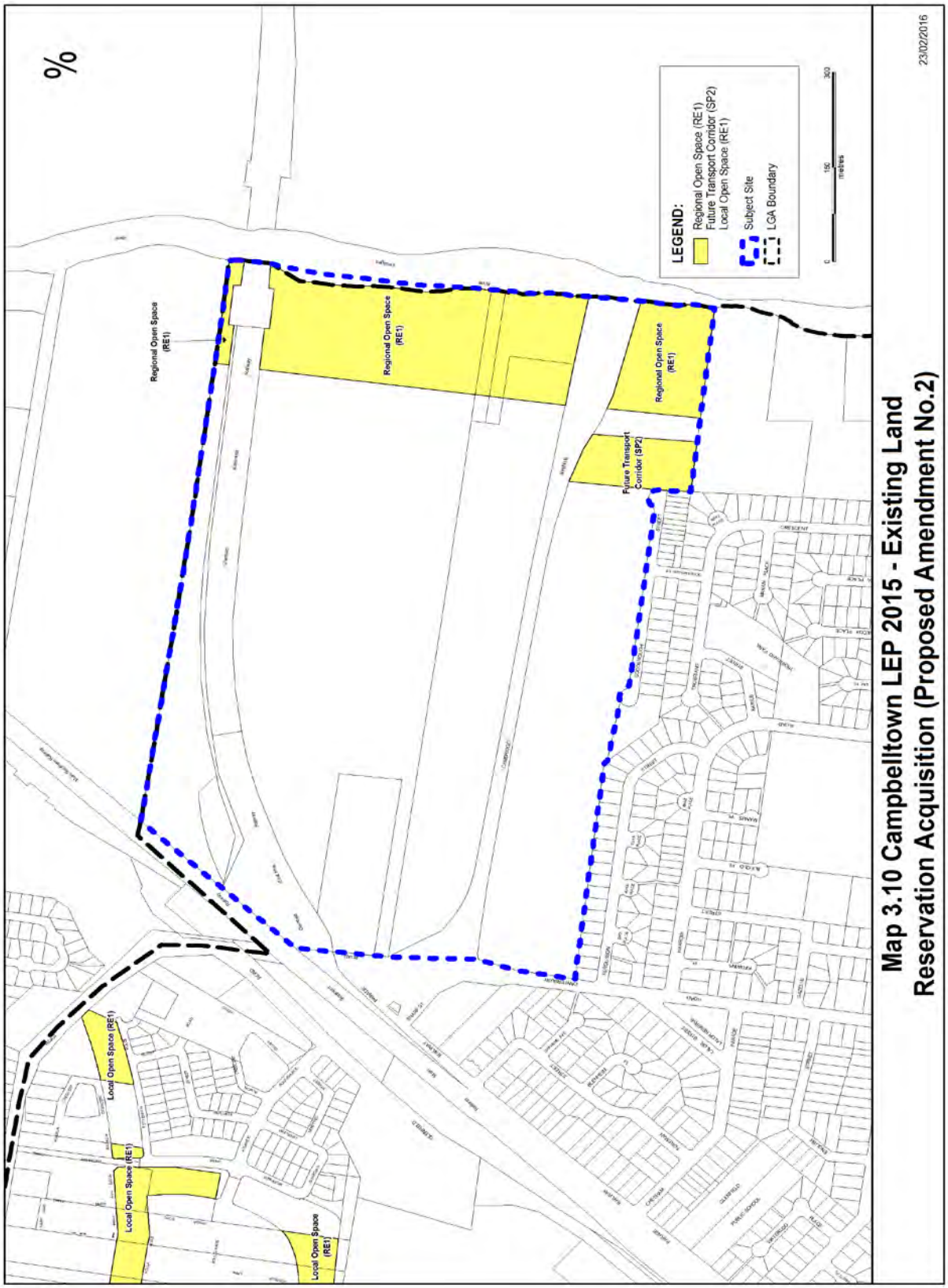

Map 3.5 Campbelltown LEP 2015 - Proposed Zoning (Proposed Amendment No.2)
23/02/2016
LEGEND:
Deferred Matter
General Industrial
Infrastructure
Low Density Residential
Public Recreation
Subject Site
LGA Boundary
IN1
RE1
SP2 Car Park
SP2 Future Transport Corridor
SP2 Road
SP2 Railway Corridor
SP2 Classified Road
SP2 Railway
SP2 Educational Establishment
R2
DM

%
LEGEND:
G 450 sq.m Minimum Lot Size
I 500 sq.m Minimum Lot Size
Subject Site
LGA Boundary
0
180
360
metres
23/02/2016
Map 3.6 Campbelltown LEP 2015 - Existing
Lot Size (Proposed Amendment No.2)


Map 3.7 Campbelltown LEP 2015 - Proposed
Lot Size (Proposed Amendment No.2)
23/02/2016
LEGEND:
G 450 sq.m Minimum Lot Size
I 500 sq.m Minimum Lot Size
W 4,000 sq.m Minimum Lot Size
Subject Site
LGA Boundary
0
150
300
metres
W
W
I
G

%
LEGEND:
8.5 Maximum Building Height (m)
Subject Site
LGA Boundary
0
150
300
metres
23/02/2016
Map 3.8 Campbelltown LEP 2015 - Existing Height of Buildings (Proposed Amendment No.2)

LEGEND:
I 8.5 Maximum Building Height (m)
M 12 Maximum Building Height (m)
Subject Site
LGA Boundary
0
150
300
metres
23/02/2016
Map 3.9 Campbelltown LEP 2015 - Proposed Height of Buildings (Proposed Amendment No.2)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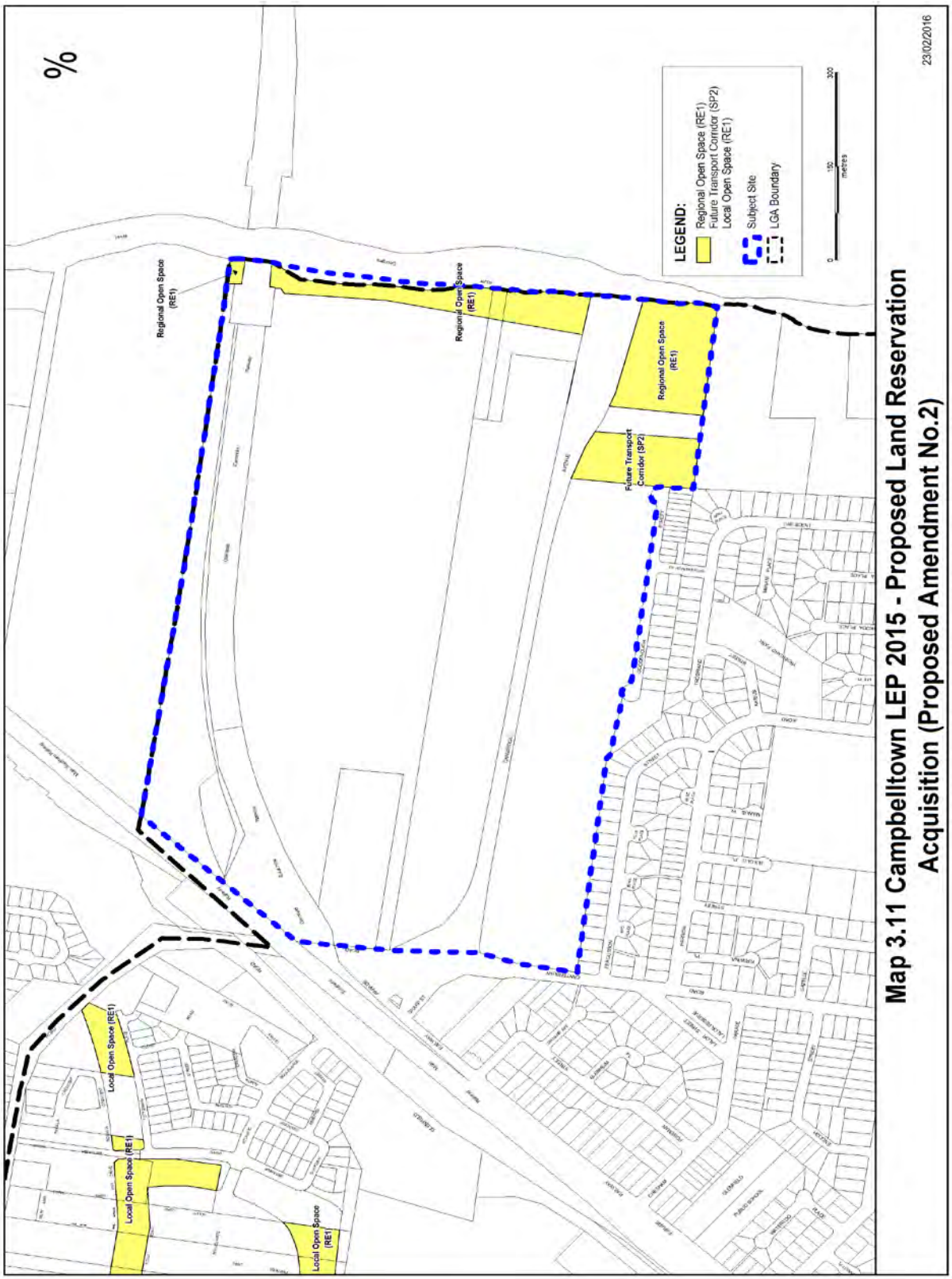
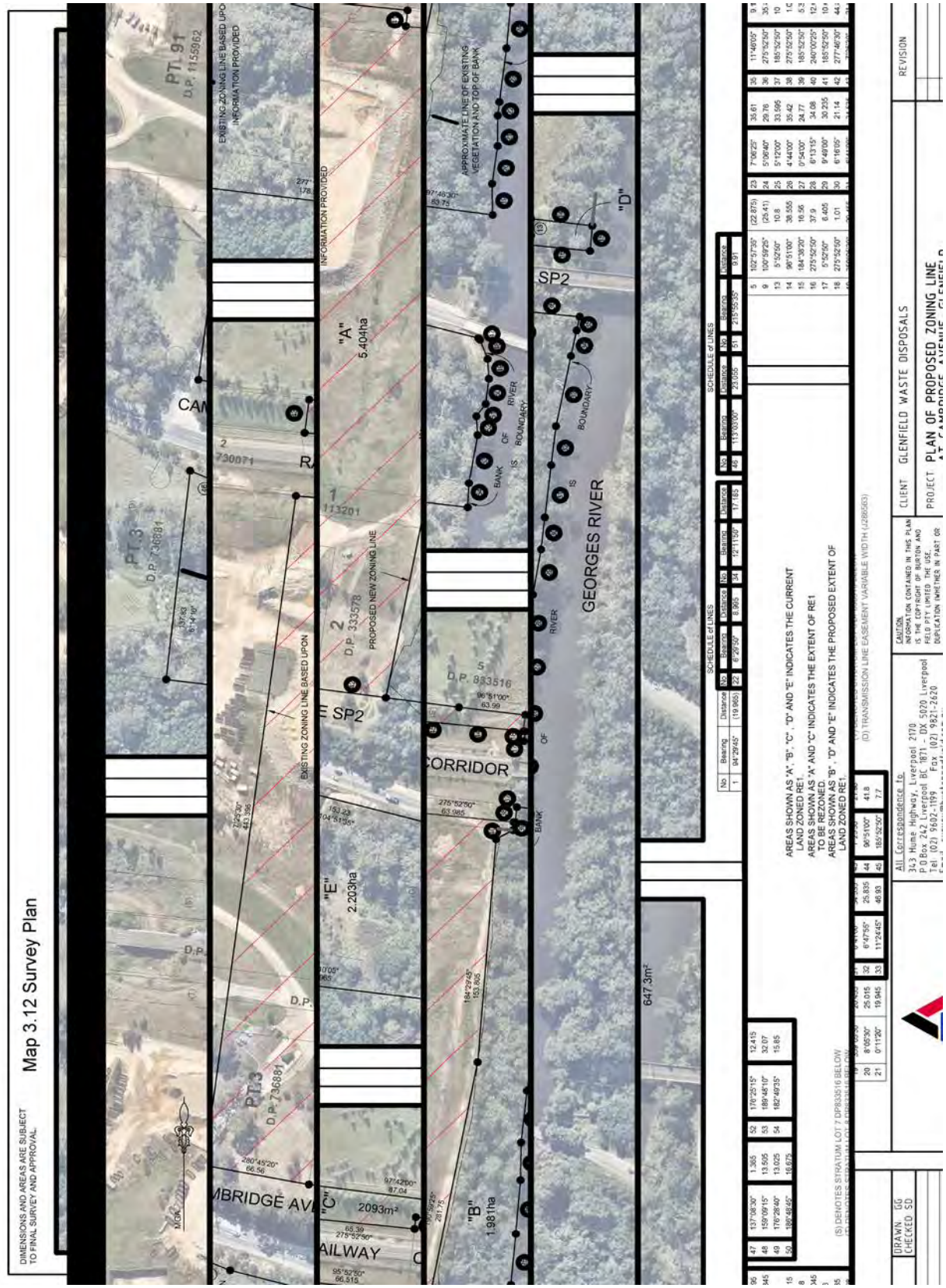
LEGEND:
Regional Open Space (RE1)
Future Transport Corridor (SP2)
Local Open Space (RE1)
Subject Site
LGA Boundary
0
150
300
metres
Regional Open Space (RE1)
Regional Open Space (RE1)
Regional Open Space (RE1)
Future Transport Corridor (SP2)
Local Open Space (RE1)
Local Open Space (RE1)
Local Open Space (RE1)
Map 3.10 Campbelltown LEP 2015 - Existing Land
Reservation Acquisition (Proposed Amendment No.2)
23/02/2016


Map 3.11 Campbelltown LEP 2015 - Proposed Land Reservation Acquisition (Proposed Amendment No.2)
23/02/2016
LEGEND:
Regional Open Space (RE1)
Future Transport Corridor (SP2)
Local Open Space (RE1)
Subject Site
LGA Boundary
0
150
300
metres
Regional Open Space (RE1)
Regional Open Space (RE1)
Regional Open Space (RE1)
Future Transport Corridor (SP2)
Local Open Space (RE1)
Local Open Space (RE1)
Local Open Space (RE1)


Map 3.12 Survey Plan
DIMENSIONS AND AREAS ARE SUBJECT TO FINAL SURVEY AND APPROVAL.
PT. 91
D.P. 1155962
PT. 3
D.P. 736881
"A"
5.404ha
"B"
1.981ha
"C"
2093m²
"D"
"E"
2.203ha
647.3m²
SP2
D.P. 333578
D.P. 833516
PROPOSED NEW ZONING LINE
EXISTING ZONING LINE BASED UPON INFORMATION PROVIDED
APPROXIMATE LINE OF EXISTING VEGETATION AND TOP OF BANK
GEORGES RIVER
CORRIDOR
MBRIDGE AVE
AILWAY
SCHEDULE of LINES
AREAS SHOWN AS "A", "B", "C", "D" AND "E" INDICATES THE CURRENT LAND ZONED RE1.
AREAS SHOWN AS "A" AND "C" INDICATES THE EXTENT OF RE1 TO BE REZONED.
AREAS SHOWN AS "B", "D" AND "E" INDICATES THE PROPOSED EXTENT OF LAND ZONED RE1.
(S) DENOTES STRATUM LOT 7 DP833516 BELOW
(D) TRANSMISSION LINE EASEMENT VARIABLE WIDTH (J286563)
DRAWN GG
CHECKED SD
All Correspondence to
343 Hume Highway, Liverpool 2170
P.O Box 242 Liverpool BC 1871 - DX 5020 Liverpool
Tel (02) 9602-1199 Fax (02) 9821-2620
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CLIENT GLENFIELD WASTE DISPOSALS
PROJECT PLAN OF PROPOSED ZONING LINE
REVISION

Attachment 2.1

Infrastructure Report

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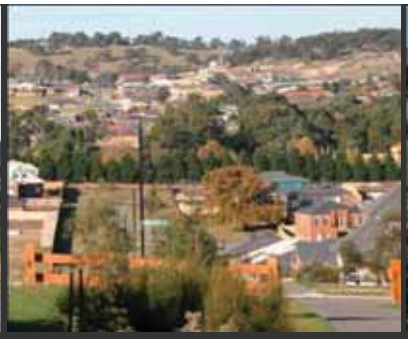

Environmental Property Services Services Report

L.A. Kennett Enterprises Glenfield

May 2012

SMEC Urban Ref No.: 31177679

urban design | planning | engineering | transport planning | surveying | landscape architecture | project management

Quality Assurance – Report Record

Prepared by:	Paul Parfenow – Senior Engineer
Reviewed by:	Graeme Fleming – Manager Infrastructure
Approved by:	Graeme Fleming – Manager Infrastructure
Revision No.:	1
Date of issue:	21 May 2012
Client:	Environmental Property Services
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Appendix A - Power
Appendix B - Sewer
Appendix C - Water

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North Sydney NSW 2060

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Commercial in Confidence

1 Background

SMEC Urban have been engaged by Environmental Property Services to undertake a review and prepare a report on its findings in relation to the availability of utility services on and adjacent to a landholding owned by L.A.Kennett Enterprises at Cambridge Avenue, Glenfield. This report is to be included with an application to Campbelltown Council for rezoning of the majority of the land to the Standard Instrument LEP Zone IN1 General Industrial.

2 The Study Area

The entire landholding owned by Kennett Enterprisers has an approximate area of 100 ha area comprised of 10 contiguous parcels**.** Together they roughly form a triangular shape bounded on the north western boundary by the Macarthur Rail Corridor, on the east by the Georges River, on the south by residential development in Fergusson Street and Goodenough Street, and then on the west by Canterbury Road and the Glenfield Road Overpass. Cambridge Avenue, and the East Hills Rail Corridor bisects the southern portion of the site in an east / west direction.

The site falls within the Local Government Area (**LGA**) of Liverpool City Council and Campbelltown City Council. The Local Government boundary between Liverpool and Campbelltown approximates the northern boundary of Lot 91 adjacent to the northern alignment of the East Hills rail line.

The study area the subject of this report is the southern portion of the landholding within the Campbelltown LGA. It is comprises of five lots with a total area of 59Ha bounded on the south by residential development in Fergusson Street and Goodenough Street, on the west by Canterbury Road and the Glenfield Road Overpass, on the north by the LGA boundary between Liverpool and Campbelltown being the northern boundary of Lot 91 , and finally on the east by the Georges River.

3 Study Area Title Particulars

Title Reference	Lot & Deposited Plan	Proprietor	Area (Ha)
Auto Consol 14018-92	Lot 1 DP 113201	JC&FW Kennett P/L	0.1418 ha
	Lot 2 DP 333578		1.346 Ha
	Lot 91 DP 1155962		29.96 Ha
3/735524	Lot 3 DP 735524	Figela Pty Ltd	2.432 Ha
3/736881	Lot 3 DP 736881	Figela Pty Ltd	25.21 Ha

That part of Lot 3 DP 736881 on the south side of Cambridge Avenue is burdened by an electrical easement effecting most of the land.

Lot 91 is effected by stratum Lots 7 and 8 in DP 833516 that have a small impact on the useable area adjacent to the East Hills rail corridor.

4 Existing Infrastructure

4.1 Electricity

Development in the immediate vicinity of the site is mainly urban land use. As a result there is minimal high voltage reticulation in place to service the area. Power and street lighting is provided on the southern side of Cambridge Avenue. Connection to the waste depot is assumed to occur at the eastern end of Cambridge Avenue. There are two existing 330kV transmission lines running in the electrical easement on the southern side of Cambridge Avenue.

The 11kV feeders for the existing reticulation are from the Prestons Zone Substation (Cnr Bernera Road and Camden Valley Way) and the Macquarie Fields Zone Substation (Cnr Macquarie and Fields Streets). It appears from our initial enquires with Endeavour Energy that these feeders do not have additional capacity to support industrial land use.

4.2 Sewer

Existing residential development adjacent to the site is reticulated by gravity mains that fall to 2 sewer pump stations, one near the intersection of Railway Parade and Canterbury Road, the other within public reserve in Trobriand Crescent. The pump stations then pump via pressure main to a ridge further south and then by gravity main to the Glenfield treatment plant. The subject site is not reticulated to sewer.

4.3 Water

The residential precincts adjacent to the site are currently serviced from a 300mm diameter water main running along Glenfield Road down into Canterbury Road past the intersection with Cambridge Avenue. There are not any water mains laid in Cambridge Avenue. It is unlikely there will be additional capacity in the 300 diameter main to service the proposed land use.

4.4 Telecommunications

- AAPT have installed optic fibre cable some distance from the study area closer to Glenfield Station, and will not be in a position to bring trunk services to site.
- Optus fibre optic cable is located within Telstra conduits in Railway Parade extending to end to the roundabout intersection with Cambridge Avenue and Canterbury Road. From there it passes under the State Rail interchange infrastructure before heading north to service Glenfield Road and Leacocks Lane,
- Visionstream run their cables within the same third party conduits used by Optus in Railway Parade and Glenfield Road,
- A Telstra underground service runs in a single conduit from the intersection roundabout at Canterbury Road along the northern side of Cambridge Avenue for approximately 500m in an easterly direction to a communications tower. Other Telstra service are contained within the southern side of the East Hills rail corridor.

4.5 Gas

- APA Group manages a high pressure ethane pipeline on behalf of Gorodok. The pipeline runs within Lot 91 parallel to the southern side of the East Hills Rail Corridor and passes under the rail corridors towards the western end of the site near Glenfield Road. The pipeline is a dedicated service for the ICI petrochemical plant at Botany and cannot be accessed to service the proposed development of the site. Building restriction will apply adjacent to the pipeline.
- A Jemena high pressure 1050kPa 150mm steel natural gas main is located within Canterbury Road, and passes under the Cambridge Ave intersection and the rail junctions into Glenfield Road. It currently services the subject site.

5 Site Generated Infrastructure Demands

Given the sites location proposed zoning classification as IN1 General Industrial, it is assumed development will take the form of warehousing, and logistics. Given also the site constrains, it had been assumed that the site area available for rezoning is 28 Ha.

5.1 Electricity

For the purposes of determining likely power demand requirements it is assumed after allowing for setbacks, new roads, hard stand, and trafficable area, that the nett useable building area will be in the order of 20 Ha.

Endeavour Energy advised an expected load of 5 MVA assuming the site is development for mainly warehouse use. If other uses such as data centres or cold storage are proposed, this would increase the requirement significantly. In this circumstance, specific information would be required by Endeavour Energy before demand calculations could be determined.

Under current Endeavour standards an 11kV feeder is able to carry 4.5 MVA necessitating two feeders for the site. As advised elsewhere in this report the closest existing zone substation is located at Prestons. An additional zone substation is currently under construction in Box Road Casula and is expected to be completed in 2014.The likely feeder distances would be:

- Casula – 3.1 km
- Preston -- 5.5km

See Appendix A for route maps.

Actual availability to supply the proposal will be determined by Endeavour at the time a formal request is made for connection and cannot at this stage be guaranteed from any particular zone substation.

Supply to the site would be via spare existing 150mm ducts within the road reserves, however additional road crossing may need to be under bored where crossing major roads such as Camden Valley Way and the M5. There may be other location along the route that will require under boring of Council roads at additional cost. We are advised that ducts are available for use to cross under the railway lines subject to approval. Should these duct be in use prior to the feeders being installed there will be additional costs to install additional ducts and a delay of up to three years to achieve the necessary approvals.

Reticulation of an industrial subdivision would also include a requirement for provision of pad mounted substations at strategic locations within the subdivision. In addition, each separate development on individual lots would also require a dedicated 1000kVA pad mount substation to service specific power requirements.

5.2 Sewer

The subject land on the northern side of Cambridge Avenue ultimately falls to the north eastern corner of the site adjacent to the Georges River. Development of the site would therefore likely drain by gravity sewer to this point before being pumped via a new rising main to either the pump station in Trobriand Crescent or an alternative route if required. Given the disturbed nature of the landform in the north east corner, a site level survey would assist at the appropriate time to confirm the area of the site that can be serviced by sewer and confirm the number of pump stations needed. Additional grading of the site may assist in ensuring all of the site is able to be serviced by sewer.

Alternatively, a gravity system that drains to a pump station located adjacent to the existing water bodies in the middle of lot 91 and thence by rising main to Trobriand Crescent could service the site.

The position of any pump station and final route for a rising main would be determined by Sydney Water after detailed analysis of the existing system including the capacity of the existing pump stations and downstream gravity systems to accommodate additional flow.

Conservatively, Sydney Water guidelines for determining design flows for future industrial development based on 150 EP per ha, suggest a discharge of 83 litres per second. Depending upon the final approved land use zone and development controls this figure may be able to be reduced.

Reticulation of a gravity system within the site is dependant upon the layout of road and lot patterns proposed. Costing for site reticulation is therefore sensitive to this and may ultimately require careful lot grading and design to avoid additional costs associated with installing additional rising mains and pump stations.

See Appendix B for rising main route options

5.3 Water

As noted elsewhere in this report the existing 300mm diameter water main in Canterbury Road is unlikely to have capacity to service the proposed development.

There is a 375mm diameter main within Glenfield Road some distance away from the site that may be able to be able to be extended to service the site. If it were extended to the existing 300mm diameter main where it exits from beneath the rail line in Glenfield Road the likely mains required could be as follows;

- Glenfield Road 375 mm main - 800m
- Cambridge Avenue 150 mm main - 500m
- Site reticulation 100mm main - 1600m

If the 375mm main requires upgrading at the rail crossing there will be considerable time delay and costs associated with gaining the necessary approvals and under boring the rail lines.

The above information is an estimate only and will require an application to Sydney Water for a feasibility study to determine the capacity of the existing main and how the site could be serviced.

See Appendix C for trunk water main location.

5.4 Telecommunications

Telstra, Optus and Visionstream have services within close proximity of the site. Each provider will have different costs associated with extending service to the site. Once the preferred provider is determined an application will need to be made to confirm costs. Again, site demand and costs will be determined by the configuration of the ultimate development pattern.

5.5 Gas

Jemena advise that the 1050kPa main in Canterbury Road has capacity to service the proposed industrial land use. Demand will be site specific to individual end users on site. Generally, experience has shown there is little demand for gas supply to warehousing. An exception to this may be where a user proposes gas for cogeneration of electricity.

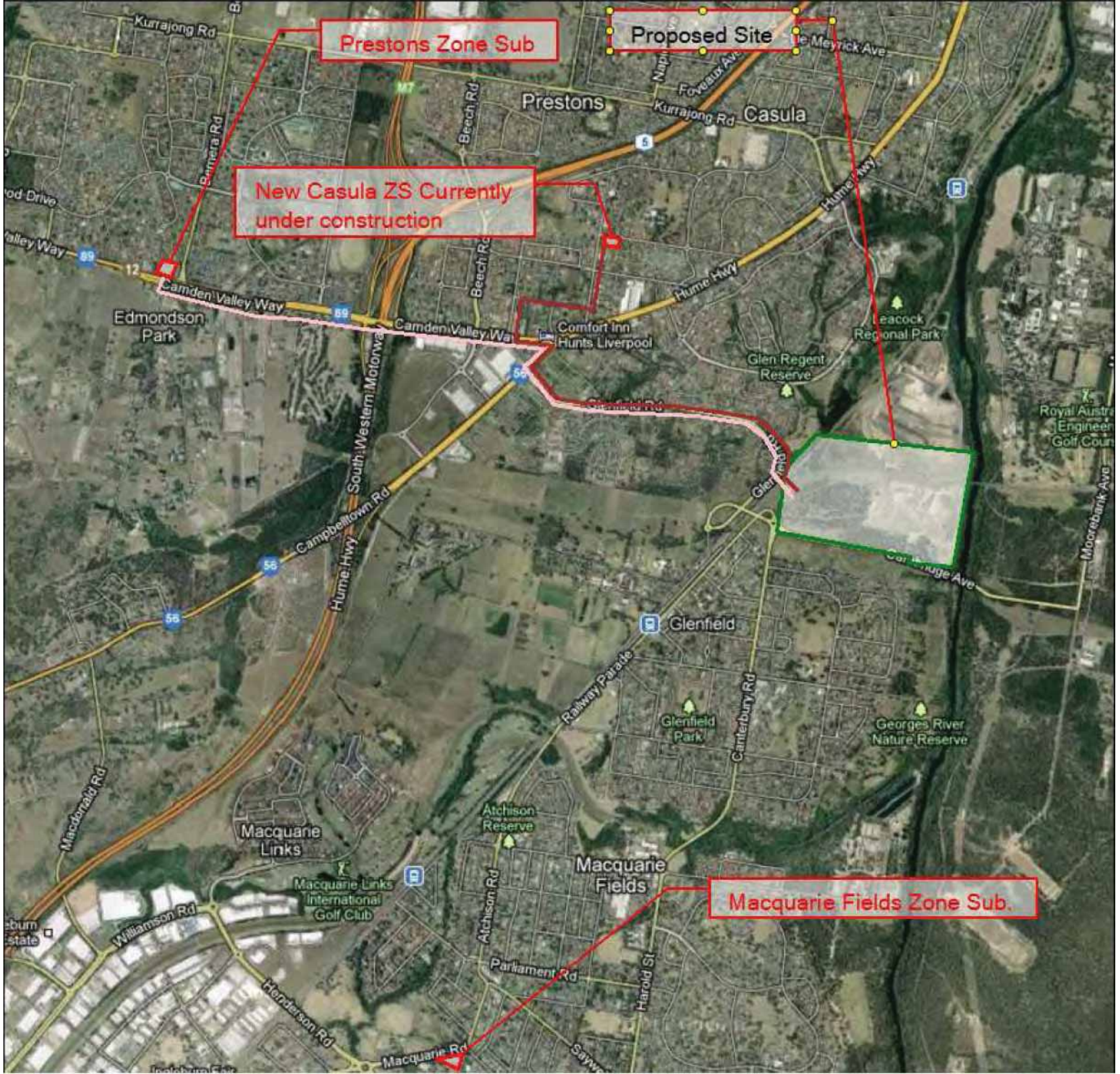
Jemena policy is not to extend network to new industrial subdivisions without a known gas load to a specific end user .

6 Conclusion

Our investigations of the study area confirms all major utility services are currently within the vicinity of the subject site. Given the area of land proposed for rezoning, it would be appropriate to make a formal approach to Sydney Water and Endeavour Energy as early as practical, to identify likely future utility requirements for the site . This will assist the service authorities in their long term network planning and ensure that when needed, utility services are available.

This report has considered provision of utility servicing to the site via upgrades to existing services only. There may be opportunities in the future with improvements in technology to investigate alternative methods of service provision. These could include harnessing of methane gas or solar energy for electrical generation, or onsite management of waste water. The long term viability of alternatives will need to address cost differentials, installation costs, maintenance and service agreements with authorities, continuity of supply, and acceptance in the marketplace, to be able to be successfully utilised at this site.

Appendix A


Prestons Zone Sub
Proposed Site
New Casula ZS Currently under construction
Macquarie Fields Zone Sub.
Kurrajong Rd
Prestons
Casula
Beech Rd
Barners Rd
Hume Hwy
Camden Valley Way
Edmondson Park
Comfort Inn Hunts Liverpool
Glen Regent Reserve
Leacock Regional Park
South Western Motorway
Campbelltown Rd
Glenfield
Railway Parade
Canterbury Rd
Glenfield Park
Georges River Nature Reserve
Macquarie Links
Macquarie Links International Golf Club
Atchison Reserve
Macquarie Fields
Atchison Rd
Parkland Rd
Harold St
Williamson Rd
Henderson Rd
Macquarie Rd
Macdonald Rd
Moorebank Ave

Appendix B

PLAN OF POTENTIAL SEWER UPGRADE

SCALE 1:2500

REVISION		DATE	DES/DFT	APP'D
A	INITAL ISSUE	18/05/12	MP/MN	--

Principal
L.A. KENNETT
ENTERPRISES

Designed
M. PLETKAN

Drawn
M. NEILSON

Checked
P. PARFENOW

Authorised
P. G. McNAMARA

Date
MAY 2012

N

Scale @ A1
1:2500

0 25 50 100

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Canberra	+61 2 6126 1900	Perth	+61 8 9323 5800
Geelong	+61 3 5238 3100	Traralgon	+61 3 5173 0100

GLENFIELD
CAMBRIDGE AVENUE
CAMPBELLTOWN CITY COUNCIL
SERVICES REPORT
PLAN SHOWING POTENTIAL SEWER UPGRADE

Drawing No. 77679.00.P02 **Rev** A
Sheet No. 1 of 1

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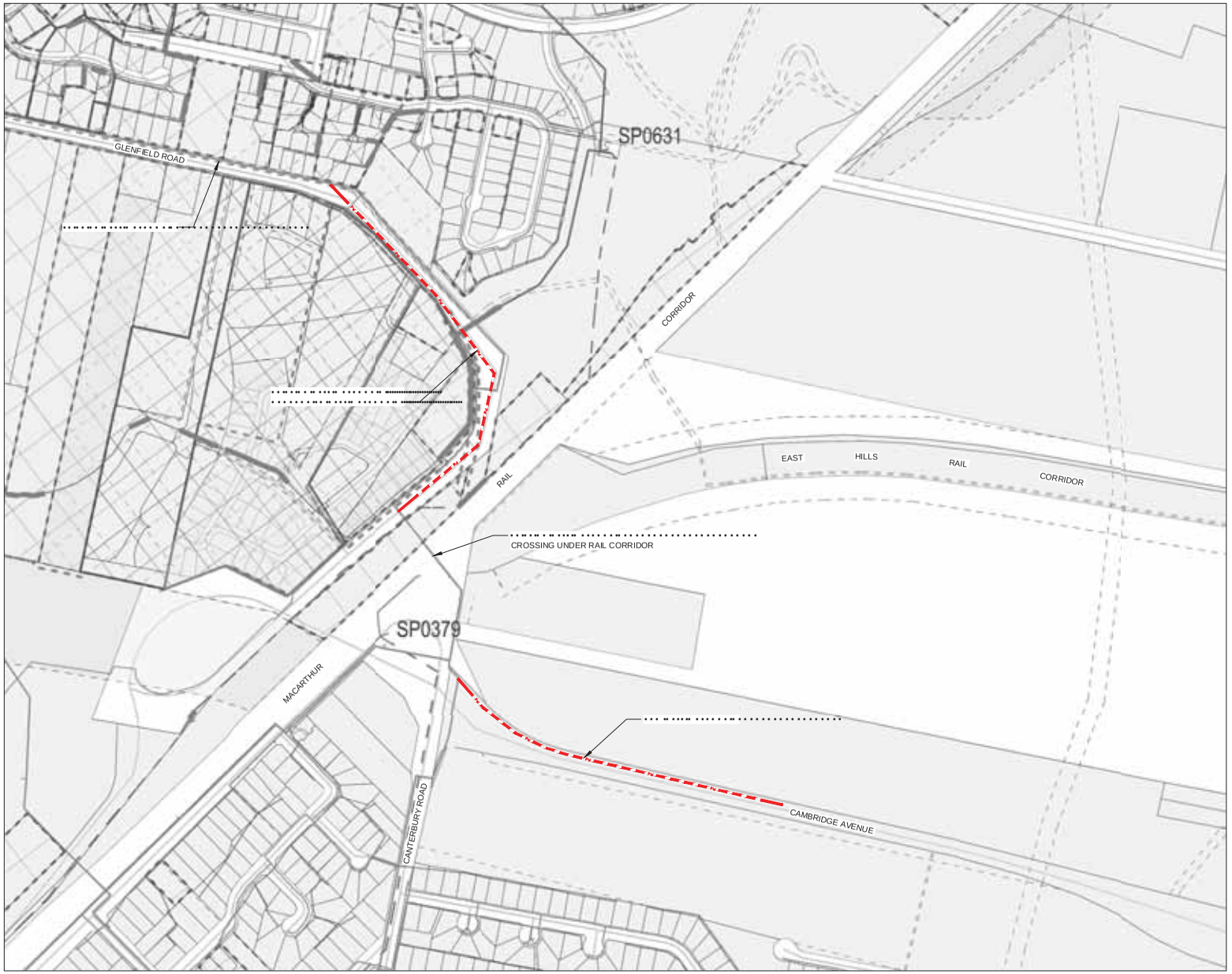
Appendix C



LEGEND:

PROPOSED WATER

PLAN OF POTENTIAL WATERMAIN UPGRADE

SCALE 1:2500

REVISION		DATE	DES/DFT	APP'D
A	INITAL ISSUE	18/05/12	MP/MN	--

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Designed
M. PLETKAN

Drawn
M. NEILSON

Checked
P. PARFENOW

Authorised
P. G. McNAMARA

Date
MAY 2012

N

Scale @ A1
1:2500

0 25 50 100

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GLENFIELD

CAMBRIDGE AVENUE
CAMPBELLTOWN CITY COUNCIL
SERVICES REPORT
PLAN SHOWING POTENTIAL WATERMAIN UPGRADE

Drawing No. 77679.00.P01 **Rev** A

Sheet No. 1 of 1

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Attachment 2.2

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

prepared for

Glenfield Waste Services

prepared by

ARC Traffic + Transport

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Executive Summary

Glenfield Waste Services (**GWS**) proposes the rezoning of the certain land at the Glenfield Waste Site, Cambridge Avenue, Glenfield (the **Site**) so as to provide for industrial development (the **Proposal**). The Proposal considers some 60 hectares (**ha**) across the southern portion of the Site, but further to the identification of parts of the 60ha most likely not suitable for traditional industrial development, it is estimated that the Proposal would specifically provide some 28ha for industrial development, yielding a gross floor area (**GFA**) of some 198,000m^2.

ARC Traffic + Transport (**ARC**) has prepared a detailed Traffic Impact Assessment (**TIA**) to appropriately assess the potential traffic and transport impacts arising from the Proposal. A summary of the TIA findings is provided below.

i. Traffic Generation

The trip generation of the Proposal has been determined with reference to recent RMS surveys of industrial precincts, and specifically with reference to the surveyed trip generation of the Erskine Park Industrial Estate, which provides warehousing development and local transport conditions similar to that forecast for the rezoned land.

In the **AM** [commuter peak hour 7:00am – 8:00am] the Site trip generation is estimated at 265 vehicle trips per hour (**vph**), and in the **PM** [commuter peak hour 4:00pm – 5:00pm] the Site trip generation is estimated at 275vph.

ii. Access

The Site provides 2 existing access points to the local road network, via **GWS Road 1** to Cambridge Avenue; and via **GWS Road 2** to Railway Parade (see **Figure 1.1.2**). The intersection of GWS Road 1 & Cambridge Avenue currently provides primary access to the Site, but the volume of additional trips generated by the Proposal – along with upgrade constraints at the intersection of GWS Road 1 & Cambridge Avenue – dictates that a new intersection be provided to Cambridge Avenue to service the rezoned land.

While a future intersection design will require finalisation further to consultation with Campbelltown City Council and the RMS, at this time it is expected that a roundabout will be provided.

iii. 2024 Traffic Forecast Scenarios

The trip generation of the Proposal has been assessed against forecast traffic through the adjacent road network for the year 2024. "Base" 2024 traffic flows specifically include the generation of the Glenfield Road Urban Release Area to the west of the Site; significant increases in Campbelltown Road through flows at the intersection with Glenfield Road; and a minor increase in flows further to background average annual growth.

GWS also proposes a State Significant Development (**SSD**) of a recycling facility (the **Facility**) at the Site; the Facility would be located north of Cambridge Avenue across some 5ha of the rezoned land, and would generate vehicle trips in addition to the Proposal. The **SSD Proposal** is the subject of a detailed TIA also prepared by ARC; the potential impacts of the SSD Proposal generating trips at the same time as the Proposal have also been examined in this TIA.

Following discussions with Transport NSW (**TNSW**), the RMS, and the Department of Planning & Environment (**DP&E**), and further to a detailed analysis of trip generation and distribution, the planned Moorebank Avenue **Intermodal**(s) has not been included in the assessment of the 2024 forecast year. Simply, the range of Intermodal trips that could potentially be generated to the road network under investigation in this TIA is so broad as to not allow an appropriate assignment as part of this TIA.

As per our discussions with the DP&E, further detailed traffic studies in regard to the Intermodal – and particularly a review of trip distribution further to a future capacity Intermodal - will be essential prior to Intermodal operations commencing.

iv. Traffic Impacts

With reference to SIDRA intersection analysis, and a review of AustRoads, RMS and other design guidelines, ARC has determined that the Proposal would have only a very moderate impact on the road network through 2024. In summary: -

- No delay increases such as would significantly reduce Level of Service (**LoS**) are reported in 2024 further to the Proposal, nor are there reports of significant capacity reductions or 95%ile queue length increases attributable to the additional Proposal trips.

- **The intersection of GWS Road 1 & Cambridge Avenue** will continue to report a poor LoS in both the AM and PM through 2024, being entirely attributable to the right turn GWS Road 1 to Cambridge Avenue. This delay relates to a handful of [generally heavy] vehicles per hour, but has no impact on the broader operation of the intersection or on 95%ile queue lengths in GWS Road 1 or Cambridge Avenue.

  Further to an approval of the SSD Proposal, these delays would be reduced as the SSD Proposal provides for the majority of this right turn demand to Cambridge Avenue to be redistributed to GWS Road 2 and then Railway Parade.

- **The intersection of Cambridge Avenue & Moorebank Avenue** reports a similarly poor LoS in the PM to the intersection of Cambridge Avenue & GWS Road 1, but this delay also relates to a very small number of vehicles turning right from Cambridge Avenue to Moorebank Avenue; as at the intersection of Cambridge Avenue & GWS Road 1, this right turn delay has no impact on the broader operation of the intersection.

  The Proposal has no significant impact on delays, capacity or 95%ile queues at this intersection.

- **The roundabout of Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade** will continue to operate at a good LoS through 2024 in the AM and PM, with the Proposal having no significant impact on delays, capacity or 95%ile queues largely as a result of the primary generation of anti-tidal flow trips. In the AM, the worst delay (to Railway Parade) is actually slightly reduced as the additional westbound trips generated by the Proposal oppose the primary Canterbury Road to Cambridge Avenue flow, providing in turn more entry opportunities for the Glenfield Road and Railway Parade approaches. This in turn would assist the SSD Proposal by reducing the potential for the Railway Parade 95%ile queue to extend to or past the intersection with GWS Road 2.

- **The roundabout of Glenfield Road & Hurlstone Agricultural College & [for the short term] a South West Railway Construction Access** operates at a good LoS in the AM and PM through 2024, though the single lane capacity is reduced, and 95%ile queue lengths increased, but in and of itself the Proposal has no significant impact on delays, capacity or 95%ile queues at this intersection.

- **The signalised intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road** will continue to operate at a good LoS with moderate delays, though 95%ile queue lengths will be increased, but the Proposal in and of itself has no significant impact on delays, capacity or 95%ile queues at this intersection.

- **The intersection of Campbelltown Road & Glenfield Road** will accommodate significantly increased traffic flows by 2024. While the intersection will continue to operate at a good LoS (specifically further to the RMS Campbelltown Road Upgrade Project) 95%ile queue lengths in Campbelltown Road and in Glenfield Road in both the AM and PM will likely still be significant. These increases relate to broader sub-regional traffic flow increases; the trip generation of the Proposal in and of itself has no significant impact on delays, capacity or 95%ile queues at this intersection.

- **The Cambridge Avenue Causeway** is estimated to accommodate some 1,800vph in the AM and PM by 2024. While this flow is within the theoretical capacity of a two lane road, consideration of the width of the Causeway, directional splits and the lack of an adjacent verge suggests a lower capacity; conversely, the Causeway represents only a very small section of Cambridge Avenue which more generally provides the characteristics suitable to accommodate higher capacity flows. As importantly, there is significant separation between the Causeway and the 'bookend' intersections to the east and west such that "free-flow" conditions are observed.

  While there is growing pressure to replace the Causeway (with a high level bridge) to ameliorate both traffic and [perhaps more importantly] flooding issues, the trips generated by the Proposal would in and of themselves have no significant impact on the operation of the Causeway, assisted by the fact that they are primarily anti-tidal, and therefore do not significantly increase [nor oppose] the tidal flow in the AM (eastbound) or PM (westbound). The Proposal would generate less than 5% of two-way flows at the Causeway in 2024.

- Finally, the addition of the SSD Proposal trip generation has no impact on these findings, primarily as a result of the very low generation of the SSD Proposal.

v. Additional Sub-Regional Issues

While the local road network will operate at a generally good LoS through 2024, it is nonetheless the case that upgrade requirements are already being considered. The provision of a [four lane] bridge to replace the Causeway remains a subject of much debate, with the greatest potential for implementation linked very specifically to the Intermodal; however, with current Intermodal traffic assessments reporting only a very minor Intermodal generation via Cambridge Avenue, this link is somewhat tenuous.

The assessment of the Intermodal provided in this TIA suggests the potential for significant Intermodal trip generation through the local road network, particularly for trips to/from Campbelltown Road; and trips to the Hume Motorway via the Campbelltown Road on-ramp. If such potential is realised, it may be that the bridge (and potentially the Campbelltown City Council proposed "Link Road" to Campbelltown Road) will be required; this would certainly take pressure off Moorebank Avenue and the M5 Interchange, at which all but unacceptable delays are reported in the current Intermodal traffic assessments, even further to recommended upgrade works.

Given that the current Intermodal traffic assessments consider only an Intermodal of 1M unit capacity – and that the final Intermodal is estimated to provide 1.7M unit capacity – a viable southern route appears essential to the sustainability of the broader sub-regional (and indeed regional) road network.

vi. Conclusion

It is the conclusion of ARC that the Proposal is supportable, primarily as a result of a moderate trip generation during the peak periods – simply, the existing and future local road network can accommodate the Proposal with minimal resulting impacts.

Further to rezoning approval, detailed Traffic Impact Assessments will necessarily be prepared to support future Development Applications for the Site. These assessments would assess and review traffic and transport conditions at the time of the Development Applications; as detailed in this TIA, it is the case that there is potential for significant changes to the road network even in the short term, and any such changes will require appropriate assessment prior to Site development.

Nonetheless – and specifically further to the detailed consideration of all known local and sub-regional traffic issues – ARC has determined that there are no identifiable impediments to the rezoning of parts of the southern portion of the Site for industrial development.

Introduction

Glenfield Waste Services (**GWS**) proposes the rezoning of the certain land at the Glenfield Waste Site, Cambridge Avenue, Glenfield (the **Site**) so as to provide for industrial development (the **Proposal**). The Proposal considers some 60 hectares (**ha**) across the southern portion of the Site, but further to the identification of parts of the 60ha most likely not suitable for traditional industrial development, it is estimated that the Proposal would specifically provide some 28ha for industrial development, yielding a gross floor area (**GFA**) of some 198,000m^2.

As part of a separate application, GWS also proposes a State Significant Development Recycling **Facility** (the **SSD Proposal**) which would occupy 5ha of the 28ha suitable for development. It is noted that the SSD Proposal is not dependent on this Proposal, but could be development with reference to either the existing or proposed zoning.

ARC Traffic + Transport (**ARC**) has been commissioned by GWS to prepare this Traffic Impact Assessment (**TIA**) to appropriately and independently assess the Proposal. As part of this TIA, ARC has completed a detailed review and assessment of potential traffic and transport impacts associated with the Proposal.

In this regard, ARC has undertaken an assessment of the existing operation of the local and sub-regional road network which provides for the Site, and the manner in which that network would operate further to an approval of the Proposal. This has included: -

- On-site observations of the local road network providing Site access to the sub-regional and regional road network, including vehicle flows, types and speeds; sight distances at key locations; and general road and intersection operations;
- A detailed review of available, and 2013 and 2014 commissioned, traffic survey data;
- A review of current Site operations
- An assessment of the traffic generation and distribution characteristics of the Proposal;
- A detailed review of potential traffic increases and distribution changes within the sub-regional network arising from the Proposal;
- A detailed review of other sub-regional projects – including the SSD Proposal - and trip generation factors which have the potential to impact traffic flows in the area of investigation;
- An assessment of future levels of service at key intersections; and
- Reference to the appropriate traffic and transport guidelines and assessment criteria, including: -
    - RTA Road Design Guide (**RTA RDG**)
    - RTA Guide to Traffic Generating Developments (**RTA Guide**)
    - RMS Technical Direction 2013 04a – Guide to Traffic Generating Developments; Updated traffic surveys (**RMS Guide Update**)
    - AustRoads Guide to Road Design Part 4A Unsignalised and Signalised Intersections (**AustRoads GRD4A**)

ARC has also discussed the Proposal and the scope of work provided in this TIA in detail with Department of Planning & Environment (**DP&E**), RMS and Transport for NSW (**TNSW**) officers; and with traffic and planning officers at Campbelltown City Council (**CC Council**) and Liverpool City Council (**LCC Council**). ARC acknowledges the time and insight provided by these officers, specifically in regard to sub-regional projects having a bearing on the operation of the broader road network; traffic forecasting; and sensitivity testing of future traffic scenarios.

It is noted that this TIA supersedes an earlier TIA (October 2014) prepared by ARC in regard to the Proposal, which was submitted to Council in later 2014 for assessment. Subsequently, Council identified a small number of matters requiring additional information, and further to our detailed discussions with Council officers, ARC provided a formal response in regard to those matters. This revised TIA provides no substantial amendments to the TIA of October 2014, but simply incorporates the formal ARC responses to the Council matters so as to provide a consolidated document for future consultation/assessment purposes.

Finally, it must be stated that this TIA provides an assessment of the impacts of the Proposal on the adjacent road network based on an industrial zoning providing for primarily warehouse development, and the resulting trip generation of such development. This TIA does not provided detailed information in regard to on-site provisions such as internal access and parking, nor construction traffic management; such details – including any variations from the industrial trip generation estimated in this TIA, and any changes in the adjacent road network occurring subsequent to this TIA - would necessarily be examined as part of future Development Applications for the Site.

1 The Existing Site

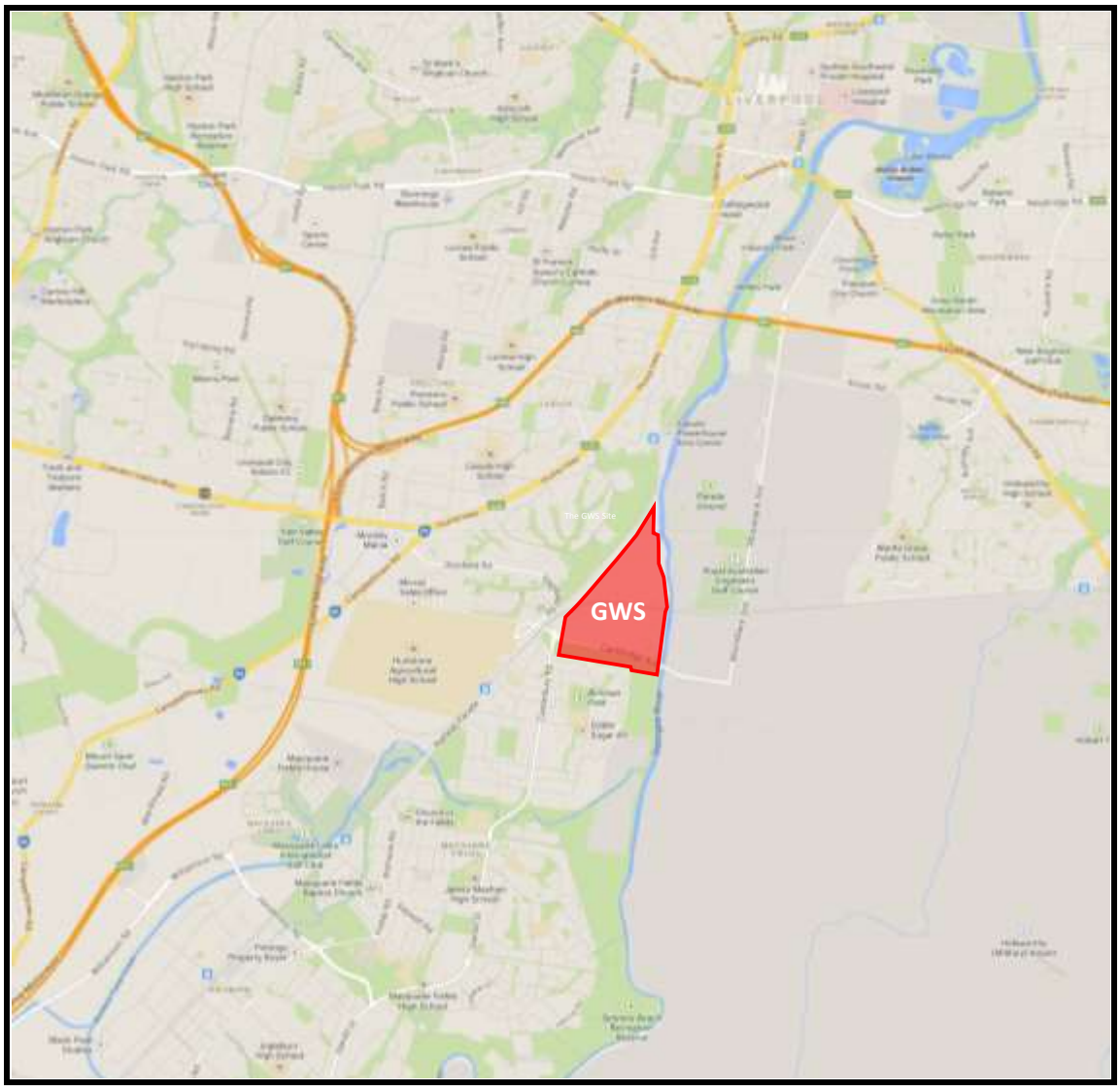
1.1 Location

The Glenfield Waste Site has an area of some 100 hectares (**ha**), and is generally bounded by: -

- Cambridge Avenue to the south
- The Georges River to the east and north-east
- The Southern Rail Line & Southern Sydney Freight Rail Line corridor to the west and north-west

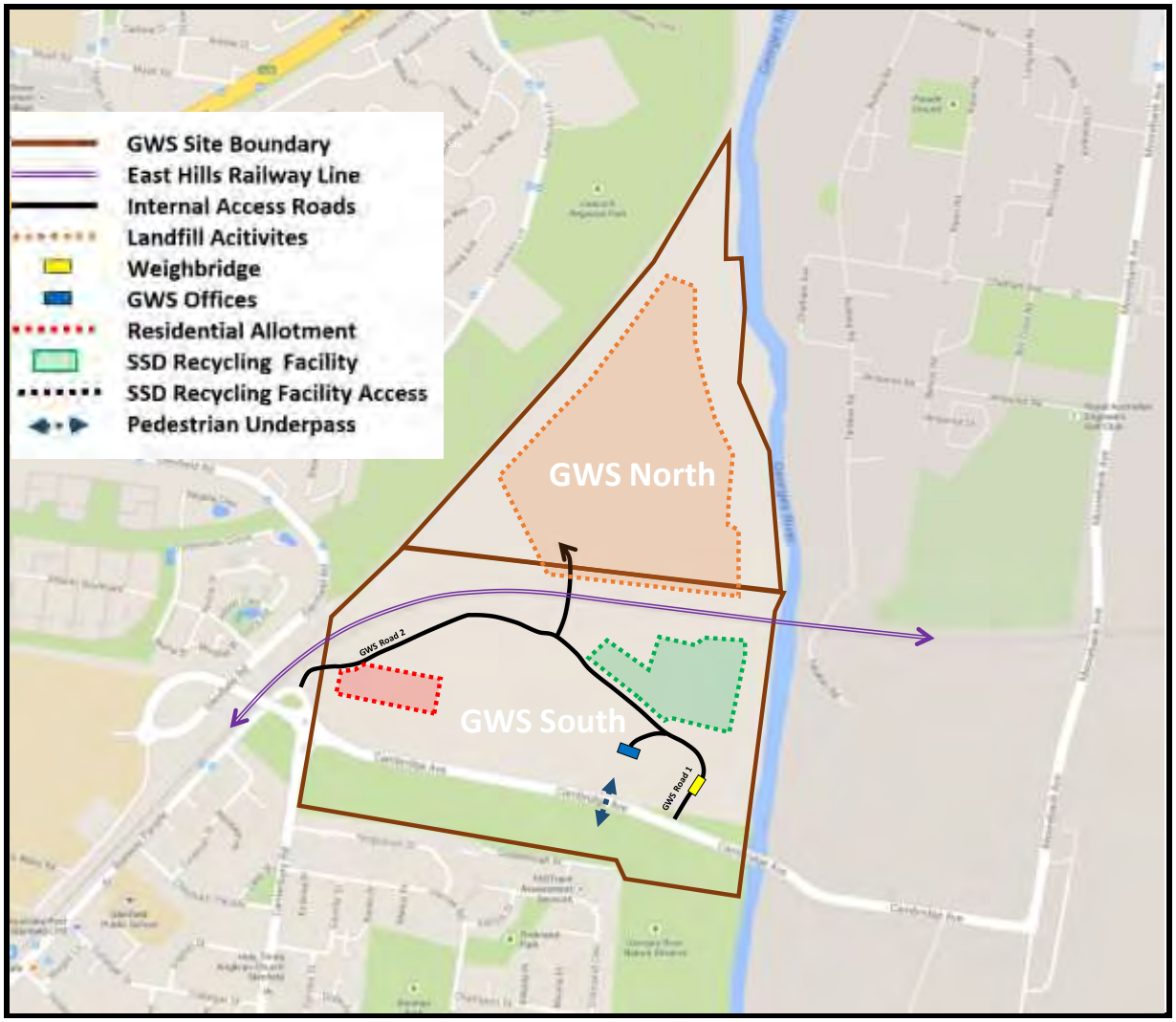
The Site in its sub-regional context is shown in **Figure 1.1.1**, while a more detailed Site plan is provided in **Figure 1.1.2**.

Figure 1.1.1 Site Location



Source: Google Maps

Figure 1.1.2 Glenfield Waste Site



Source: Google Maps & EPS

The East Hill Railway Line running east-west through the centre of the Site generally marks the boundary between LCC Council (north) and CC Council (south).

1.2 Existing Operations

The portion of the Site north of the East Hills Railway (approximately 40ha) accommodates a licenced non-putrescible waste facility which will be retained for the continuation of current [landfill] operations. The portion of the Site south of the East Hills Railway (approximately 60ha) accommodates existing recycling facilities as well as GWS offices and a weighbridge; this southern portion of the Site includes substantial (unused) land on the southern side of Cambridge Avenue, and a [single dwelling] residential allotment.

Having operated as a waste management facility since 1979, GWS is open to the public between 6:30am and 4:30pm Monday to Friday, and from 8:00am to 4:00pm on Saturdays.

The Proposal applies to the area of the Site generally north from Cambridge Avenue and south of the East Hills Railway. The current landfill operations in the northern portion of the Site would not be altered by the Proposal (or by the concurrent SSD Proposal) with vehicle access and operational capacity (and therefore trip generation) to continue essentially unchanged. Similarly, the Proposal does not provide for any additional use of the portion of the Site south of Cambridge Avenue.

1.3 Access

1.3.1 Site Access

Primary vehicle access for the Site is via an access road north from Cambridge Avenue (termed **GWS Road 1** for ease of reference) located approximately 900m east of Canterbury Road (and some 900m west of Moorebank Avenue). GWS Road 1 in turn provides access to all on-site areas associated with GWS operations.

A second access point (termed **GWS Road 2**) intersects Railway Parade; GWS Road 2 has in the past provided principle access to the Site (for GWS operations) but is not used for GWS operations at this time, specifically as a result of the need for both arriving and departing [material carrying] vehicles to pass over the weighbridge in GWS Road 1. Notwithstanding, GWS Road 2 does currently provide access for the residential dwelling within the Site; and for Railcorp maintenance vehicles accessing the adjacent rail lines.

1.3.2 Sub-Regional Access

The Site has good access to the broader sub-regional and regional road network. Campbelltown Road (and then Hume Highway, Hume Motorway and M7) are accessed by Cambridge Avenue and Glenfield Road, while Canterbury Road to the immediate west of the Site provides alternative access south to Campbelltown through residential suburbs and industrial precincts including Ingleburn and Minto. Cambridge Road also links east to Moorebank Avenue, which in turn runs north to an interchange with the M5 and then through to Liverpool.

These access paths are examined in more detailed in **Section 2**.

While these routes are open to all *General Access Vehicles* (**GAV**s), a *Restricted Access Vehicle* (**RAV**) route operates between 10:00am and 4:00pm along Glenfield Road and Cambridge Avenue between Campbelltown Road (which is RAV accessible) and GWS Road 1.

The RAV route specifically provides for the movement of vehicles (generally B-Doubles) of length greater than 19m, and/or weight greater than 42.5t, but all other vehicles (i.e. up to 19m in length and under 42.5t) can freely travel the length of Cambridge Avenue, including the **Causeway** over the Georges River immediately east of the Site.

The RMS RAV route is shown in **Figure 1.3.2**.

Figure 1.3.2 RMS Restricted Access Vehicle Route

Source: RMS

1.4 Traffic Generation

1.4.1 Traffic Survey

In order to determine the current traffic generation of the GWS operations at the Site, surveys of the intersection of GWS Road 1 & Cambridge Avenue were conducted in December 2013 and May 2014 by Skyhigh Traffic Surveys; the survey provides an indication of the current Site trip generation, but importantly the trip generation of the Proposal [and of the SSD Proposal] would essentially replace these existing flows.

1.4.2 Key Traffic Volumes

Table 1.4.2 provides an hourly summary of daily traffic flows (6:00am - 6:00pm) surveyed on Wednesday 21st May 2014 to and from the Site via GWS Road 1; as noted above, the Site is open to the public until 4:30pm on weekdays, and as such there is a significant drop in Site trip generation after this time.

Table 1.4.2 Intersection Flows, GWS Road 1 & Cambridge Avenue

Approach	Cambridge Avenue Eastbound								GWS Road 1								Cambridge Avenue Westbound								GWS Road 1			
Direction	Direction 10 (Left Turn)				Direction 11 (Through)				Direction 7 (Left Turn)				Direction 9 (Right Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Two-Way			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
6:00 to 7:00	8	2	0	**10**	1,185	54	0	**1,239**	0	4	0	**4**	0	0	0	**0**	176	6	0	**182**	3	3	0	**6**	11	9	0	**20**
6:15 to 7:15	3	2	0	**5**	1,228	52	0	**1,280**	1	5	0	**6**	1	0	0	**1**	191	9	0	**200**	4	5	0	**9**	9	12	0	**21**
6:30 to 7:30	1	3	0	**4**	1,287	41	0	**1,328**	2	6	0	**8**	1	1	0	**2**	199	8	0	**207**	4	5	0	**9**	8	15	0	**23**
6:45 to 7:45	1	4	0	**5**	1,231	28	0	**1,259**	2	6	0	**8**	1	3	0	**4**	207	7	0	**214**	3	4	0	**7**	7	17	0	**24**
7:00 to 8:00	2	3	0	**5**	1,230	22	0	**1,252**	2	4	0	**6**	1	6	0	**7**	223	6	1	**230**	1	4	0	**5**	6	17	0	**23**
7:15 to 8:15	1	5	0	**6**	1,178	20	0	**1,198**	1	4	0	**5**	1	6	0	**7**	266	5	1	**272**	0	3	0	**3**	3	18	0	**21**
7:30 to 8:30	1	5	0	**6**	1,092	30	2	**1,124**	0	3	0	**3**	1	7	0	**8**	302	7	1	**310**	1	2	0	**3**	3	17	0	**20**
7:45 to 8:45	2	3	0	**5**	1,056	35	2	**1,093**	0	3	0	**3**	2	6	0	**8**	342	8	1	**351**	1	3	0	**4**	5	15	0	**20**
8:00 to 9:00	1	7	0	**8**	937	32	2	**971**	0	2	0	**2**	2	3	0	**5**	353	9	0	**362**	1	3	0	**4**	4	15	0	**19**
8:15 to 9:15	2	5	0	**7**	821	26	4	**851**	0	3	0	**3**	1	5	0	**6**	339	8	0	**347**	3	2	0	**5**	6	15	0	**21**
8:30 to 9:30	3	4	0	**7**	693	15	3	**711**	0	4	0	**4**	3	3	0	**6**	298	6	0	**304**	2	2	0	**4**	8	13	0	**21**
8:45 to 9:45	2	4	0	**6**	555	10	3	**568**	0	3	0	**3**	3	2	0	**5**	254	4	1	**259**	2	0	0	**2**	7	9	0	**16**
9:00 to 10:00	3	2	0	**5**	484	9	3	**496**	0	3	0	**3**	3	2	0	**5**	221	6	1	**228**	2	2	0	**4**	8	9	0	**17**
9:15 to 10:15	3	5	0	**8**	421	13	1	**435**	0	2	0	**2**	4	2	0	**6**	195	9	1	**205**	0	5	0	**5**	7	14	0	**21**
9:30 to 10:30	3	5	0	**8**	356	15	0	**371**	0	3	0	**3**	4	5	0	**9**	197	13	1	**211**	1	5	0	**6**	8	18	0	**26**
9:45 to 10:45	3	6	0	**9**	325	16	0	**341**	0	4	0	**4**	5	6	0	**11**	208	14	0	**222**	1	5	0	**6**	9	21	0	**30**
10:00 to 11:00	2	7	0	**9**	312	14	0	**326**	0	4	0	**4**	5	6	0	**11**	214	12	0	**226**	1	4	0	**5**	8	21	0	**29**
10:15 to 11:15	3	6	0	**9**	299	9	0	**308**	0	3	0	**3**	4	5	0	**9**	211	10	1	**222**	1	4	0	**5**	8	18	0	**26**
10:30 to 11:30	3	6	0	**9**	297	8	0	**305**	0	3	0	**3**	4	7	0	**11**	215	6	1	**222**	1	5	0	**6**	8	21	0	**29**
10:45 to 11:45	3	8	0	**11**	286	7	1	**294**	0	4	0	**4**	3	7	0	**10**	195	10	1	**206**	1	5	0	**6**	7	24	0	**31**
11:00 to 12:00	3	7	0	**10**	280	8	2	**290**	0	6	0	**6**	3	8	0	**11**	192	8	1	**201**	1	6	0	**7**	7	27	0	**34**
11:15 to 12:15	2	5	0	**7**	277	7	3	**287**	0	9	0	**9**	4	7	0	**11**	209	7	0	**216**	1	4	0	**5**	7	25	0	**32**
11:30 to 12:30	2	6	0	**8**	302	6	3	**311**	0	8	0	**8**	2	3	0	**5**	233	10	0	**243**	1	3	0	**4**	5	20	0	**25**
11:45 to 12:45	5	3	0	**8**	303	5	3	**311**	1	6	0	**7**	5	2	0	**7**	256	8	0	**264**	1	3	0	**4**	12	14	0	**26**
12:00 to 13:00	6	2	0	**8**	314	3	2	**319**	1	4	0	**5**	5	2	0	**7**	271	10	0	**281**	1	1	0	**2**	13	9	0	**22**
12:15 to 13:15	5	2	0	**7**	319	4	1	**324**	1	1	0	**2**	7	4	0	**11**	293	14	0	**307**	1	3	0	**4**	14	10	0	**24**
12:30 to 13:30	5	2	0	**7**	288	2	2	**292**	1	4	0	**5**	7	3	0	**10**	298	10	0	**308**	0	5	0	**5**	13	14	0	**27**
12:45 to 13:45	2	2	0	**4**	306	3	1	**310**	0	5	0	**5**	3	3	0	**6**	321	10	0	**331**	1	5	0	**6**	6	15	0	**21**
13:00 to 14:00	2	3	0	**5**	317	4	2	**323**	0	5	0	**5**	4	2	0	**6**	343	10	0	**353**	1	6	0	**7**	7	16	0	**23**
13:15 to 14:15	3	3	0	**6**	333	4	2	**339**	0	6	0	**6**	2	1	0	**3**	358	7	1	**366**	2	4	0	**6**	7	14	0	**21**
13:30 to 14:30	3	2	0	**5**	345	5	1	**351**	1	2	0	**3**	4	2	0	**6**	398	13	1	**412**	3	3	0	**6**	11	9	0	**20**
13:45 to 14:45	4	5	0	**9**	368	5	2	**375**	2	1	0	**3**	5	2	0	**7**	443	12	1	**456**	2	3	0	**5**	13	11	0	**24**
14:00 to 15:00	3	3	0	**6**	366	3	1	**370**	3	2	0	**5**	6	3	0	**9**	505	13	3	**521**	2	2	0	**4**	14	10	0	**24**
14:15 to 15:15	2	4	0	**6**	369	3	1	**373**	3	1	0	**4**	5	4	0	**9**	588	15	2	**605**	1	3	0	**4**	11	12	0	**23**
14:30 to 15:30	2	5	0	**7**	419	5	2	**426**	2	2	0	**4**	4	4	0	**8**	681	12	2	**695**	1	4	0	**5**	9	15	0	**24**
14:45 to 15:45	1	2	0	**3**	422	5	1	**428**	2	3	0	**5**	5	6	0	**11**	799	15	2	**816**	2	4	0	**6**	10	15	0	**25**
15:00 to 16:00	2	2	0	**4**	418	5	1	**424**	2	2	0	**4**	3	9	0	**12**	876	13	0	**889**	2	4	0	**6**	9	17	0	**26**
15:15 to 16:15	2	1	0	**3**	412	6	1	**419**	2	2	0	**4**	3	8	0	**11**	990	14	0	**1,004**	2	3	0	**5**	9	14	0	**23**
15:30 to 16:30	1	0	0	**1**	367	4	0	**371**	2	2	0	**4**	7	8	0	**15**	1,081	20	1	**1,102**	1	1	0	**2**	11	11	0	**22**
15:45 to 16:45	1	0	0	**1**	344	3	0	**347**	1	1	0	**2**	7	6	0	**13**	1,131	19	1	**1,151**	0	1	0	**1**	9	8	0	**17**
16:00 to 17:00	0	0	0	**0**	335	5	0	**340**	0	1	0	**1**	7	2	0	**9**	1,189	27	1	**1,217**	0	1	0	**1**	7	4	0	**11**
16:15 to 17:15	0	0	0	**0**	333	4	0	**337**	0	1	0	**1**	7	1	0	**8**	1,203	29	1	**1,233**	0	0	0	**0**	7	2	0	**9**
16:30 to 17:30	0	0	0	**0**	339	3	0	**342**	0	0	0	**0**	2	0	0	**2**	1,199	21	0	**1,220**	0	0	0	**0**	2	0	0	**2**
16:45 to 17:45	0	0	0	**0**	325	3	0	**328**	0	0	0	**0**	0	0	0	**0**	1,182	25	0	**1,207**	0	0	0	**0**	0	0	0	**0**
17:00 to 18:00	0	0	0	**0**	306	2	0	**308**	0	0	0	**0**	0	0	0	**0**	1,162	20	0	**1,182**	0	0	0	**0**	0	0	0	**0**

With reference to **Table 1.4.2**, the survey shows that the Site currently generates: -

- Approximately 250 vehicle trips per day (**vpd**), of which 38% are light vehicles and 62% are heavy vehicles
- A peak hourly flow of 34 vehicles per hour (**vph**) in the hour 11:00am – 12:00pm
- A flow of 23 vph in the Cambridge Avenue **AM** [commuter peak hour 7:00am – 8:00am – see also **Section 2.3**]
- A flow of 11 vph in the Cambridge Avenue **PM** [commuter peak hour 16:00pm – 17:00pm – see also **Section 2.3**]

2 The Existing Road Network

The **road network** which provides Site access to the sub-regional road network, and which in turn will provide for the Proposal, is shown in **Figure 2** and examined in further detail below.

Figure 2 Road Network

2.1 Key Roads

2.1.1 Cambridge Avenue

As discussed, all GWS operational access is currently provided to/from Cambridge Avenue at GWS Road 1. Cambridge Avenue serves a significant trip demand generated between [primarily] the south and south-west (via Canterbury Road in particular) and the Holsworthy/Moorebank area and thence through to Liverpool. Cambridge Avenue provides two lanes for two-way traffic, and has a posted speed limit of 60km/h.

While generally providing [very] wide verges east from Canterbury Road and adjacent to the Site, immediately east of the Site Cambridge Avenue narrows to the short Causeway over the Georges River (see **Section 2.5**) before widening again through to Moorebank Avenue.

2.1.2 Moorebank Avenue

Moorebank Avenue provides connectivity from Cambridge Avenue to Moorebank, the M5 Motorway and through to Liverpool. Moorebank Avenue generally provides two lanes for two-way traffic with minor additional capacity at local intersections, and has a posted speed limit of 60km/h.

2.1.3 Glenfield Road

Glenfield Road provides connectivity between Campbelltown Road and the Site [via Cambridge Avenue]. Glenfield Road generally provides two lanes for two-way traffic, with additional capacity at key intersections, and has a posted speed limit of 60km/h.

2.1.4 Railway Parade

Railway Parade provides local access to Glenfield railway station and the Glenfield "village" before continuing south into Macquarie Fields. Railway Parade provides two lanes for two way traffic, and has a posted speed limit of 50km/h.

2.1.5 Canterbury Road

Canterbury Road provides access between Glenfield and the southern suburbs (Macquarie Fields and through to Minto). Canterbury Road generally provides four traffic lanes (with localised parking and stopping restrictions) for two-way traffic, and has a posted speed limit of 60km/h.

2.1.6 Sub-Regional and Regional Road Network Connections

As stated, the Site has good connectivity to the sub-regional and then regional road network. Glenfield Road links to Campbelltown Road, which in turn provides access to the Hume Highway, Hume Motorway (outbound trips), M7 and Camden Valley Way; while from Moorebank Avenue, connections are available to the M5 which in turn links to the Sydney motorway network.

From the outset, it is important to state that the generation of the Proposal would in our opinion have no significant impact on the broader sub-regional road network simply as a result of the very moderate traffic generation potential of the Proposal, more details of which are provided in **Section 4**.

This is also the case in regard to Moorebank Avenue, though regardless a more detailed assessment of the future operation of Moorebank Avenue is not possible at this time further to the ongoing planning of the Moorebank Avenue **Intermodal**, which is estimated to generate up to some 1,800vph in Moorebank Avenue upon reaching capacity (see **Appendix D.6**); the Proposal by comparison is estimated to generate some 84vph to Moorebank Avenue (see **Section 4** below).

As discussed with TNSW, the RMS and the DP&E, it is simply not possible to estimate flows at the [numerous] Moorebank Avenue intersections with any degree of certainty prior to the finalisation of traffic studies of a "capacity" Intermodal, and moreover given the continuing uncertainty in regard to Intermodal trip distribution.

A detailed review of the Intermodal is provided in **Section 5.6** and in **Appendix D.6**.

2.2 Key Intersections

2.2.1 Cambridge Avenue & GWS Road 1

As discussed, this priority intersection provides primary access for the Site, and includes: -

- A Channelised Left (**CHL**) deceleration lane Cambridge Avenue to GWS Road 1
- A short acceleration lane GWS Road 1 to Cambridge Avenue Road
- An Auxiliary Right (**AUR**) turn treatment Cambridge Avenue to GWS Road 1

2.2.2 Railway Parade & GWS Road 2

This priority intersection provides Basic Left and Right (**BAL** and **BAR**) treatments on all approaches. Sight distances are appropriate to the lower speed environment resulting from GWS Road 2 being situated on the 'outside' of the curve of Railway Parade, maximising sight distances to the south-east and south-west.

2.2.3 Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade

This roundabout intersection provides dual approach and departure lanes on all legs, and minimum 8.5m circulating width (two lane). The dual approach lanes diverge from single lanes in Glenfield Road, Railway Parade and Cambridge Avenue; dual departure lanes also merge to single lanes in these same roads, and in Canterbury Road so as to provide for an additional [continuous] slip lane from Cambridge Avenue.

2.2.4 Glenfield Road & Brampton Avenue & Old Glenfield Road

This signalised intersection provides access to the Glenfield Residential Estate, and provides: -

- Channelised Right (**CHR**) lanes Glenfield Road to both Brampton Avenue and Old Glenfield Road
- Dual approach lanes in Glenfield Road both eastbound and westbound
- Dual approach lanes in both Brampton Avenue and Old Glenfield Road, each with a short dedicated right turn lane

2.2.5 Campbelltown Road & Glenfield Road

This signalised intersection provides: -

- A CHR lane Campbelltown Road to Glenfield Road
- A CHL lane Campbelltown Road to Glenfield Road
- Dual right turn lanes Glenfield Road to Campbelltown Road
- A short [unsignalised] left turn slip lane Glenfield Road to Campbelltown Road

This intersection is to be upgraded as part of the RMS Campbelltown Road Upgrade Project. More details in regard to this project are provided in **Section 5.2** and **Appendix D.6**.

2.2.6 Glenfield Road & Britannia Drive

This intersection is currently under construction, and will provide for left in/left out movements only to/from Britannia Drive. As discussed with Council – and further in **Section 5.1** – this intersection is expected to reduce traffic flows at the bookend intersections (Glenfield Road & Brampton Avenue & Old Glenfield Road; and Glenfield Road & Atlantic Boulevard) providing access to the Glenfield Road Urban Release Area and would be little impacted by the additional Glenfield Road through trips generated by Proposal.

2.2.7 Glenfield Road & Atlantic Boulevard

This signalised intersection provides: -

- A CHR lane Glenfield Road to Atlantic Boulevard
- Separate left and right turn lanes, Atlantic Boulevard to Glenfield Road

As discussed with Council, it is expected that this intersection would be little impacted by the additional Glenfield Road through trips generated by the Proposal.

2.2.8 Cambridge Avenue & Moorebank Avenue

This priority intersection provides: -

- A CHR Moorebank Avenue to Cambridge Avenue
- A short left turn slip lane Cambridge Avenue to Moorebank Avenue
- A right turn lane Cambridge Avenue to Moorebank Avenue

2.2.9 Moorebank Avenue Intersections

A number of priority and signalised intersections are provided along Moorebank Avenue between Cambridge Avenue and the M5 interchange, and numerous intersection upgrades (and potentially new intersections) are proposed to provide for the Intermodal development. Key intersections include: -

- Signalised intersection of Moorebank Avenue & Chatham Avenue, which currently provides access to the Commonwealth School of Military Engineering Site
- Two signalised intersections of Moorebank Avenue & the Defence National Storage Distribution Centre
- Signalised intersection of Moorebank Avenue & Anzac Road, which provides access to industrial sites east of Moorebank Avenue, and thence through to Wattle Road and Heathcote Road

As discussed in **Section 2.1.6**, it is not possible at this time to gauge the exact level and distribution of additional future Intermodal trips at these intersections, but it is nonetheless the opinion of ARC that the additional trip generation of the Proposal would in and of itself have little if any impact on delays at each of these intersections through to the M5 being only a minor percentage of existing flows, and an even more minor percentage of future flows including Intermodal trips.

2.3 Peak Period Traffic Flows

To provide an appropriate base for the traffic assessment of the Proposal, peak period traffic surveys were conducted at the key intersections outlined in **Section 2.2** above; the surveys were completed in December 2013 and May 2014.

In determining peak hours for assessment, ARC has specifically selected those periods where the generation of the Proposal, existing commuter peaks and sub-regional project peaks have the potential to coincide and therefore have the highest collective impact on the local road network.

In the **AM**, the hour 7:00am – 8:00am represents a significantly high commuter peak through the road network as well as a higher generation of the Site than earlier periods (when Cambridge Avenue flows actually peak). Similarly, in the **PM**, the hour 4:00pm – 5:00pm reports a marginally lower flow in Cambridge Avenue and Glenfield Road than the reported commuter peak hour (5:00pm – 6:00pm) but is again estimated to coincide with a higher Site generation than later periods.

With reference to the traffic surveys, peak period traffic flows through the local road network are shown in the following figures: -

- **Figure 2.3.1 Existing AM Traffic Flows**
- **Figure 2.3.2 Existing PM Traffic Flows**

Figure 2.3.1 Existing AM 7:00am – 8:00am

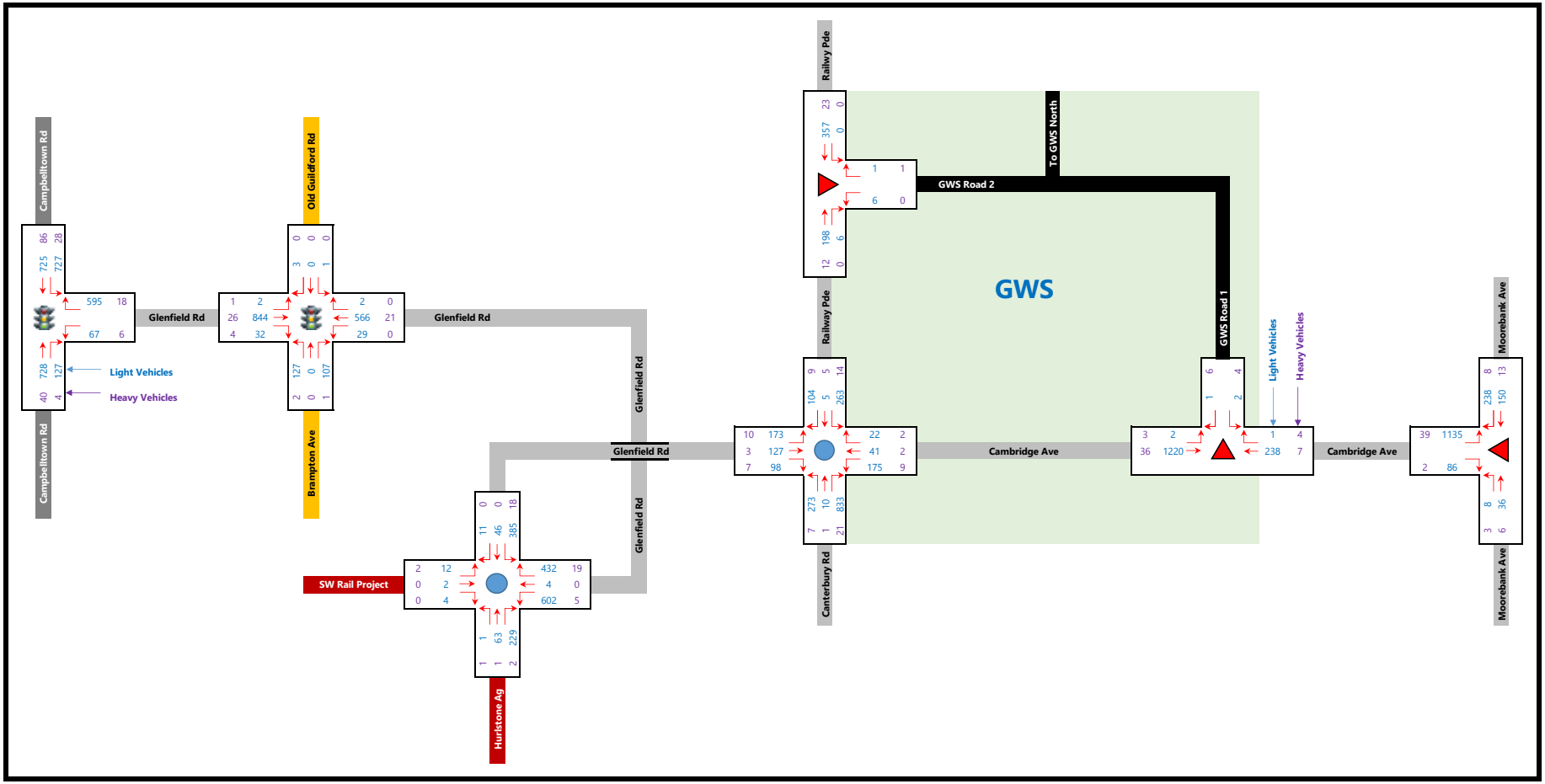
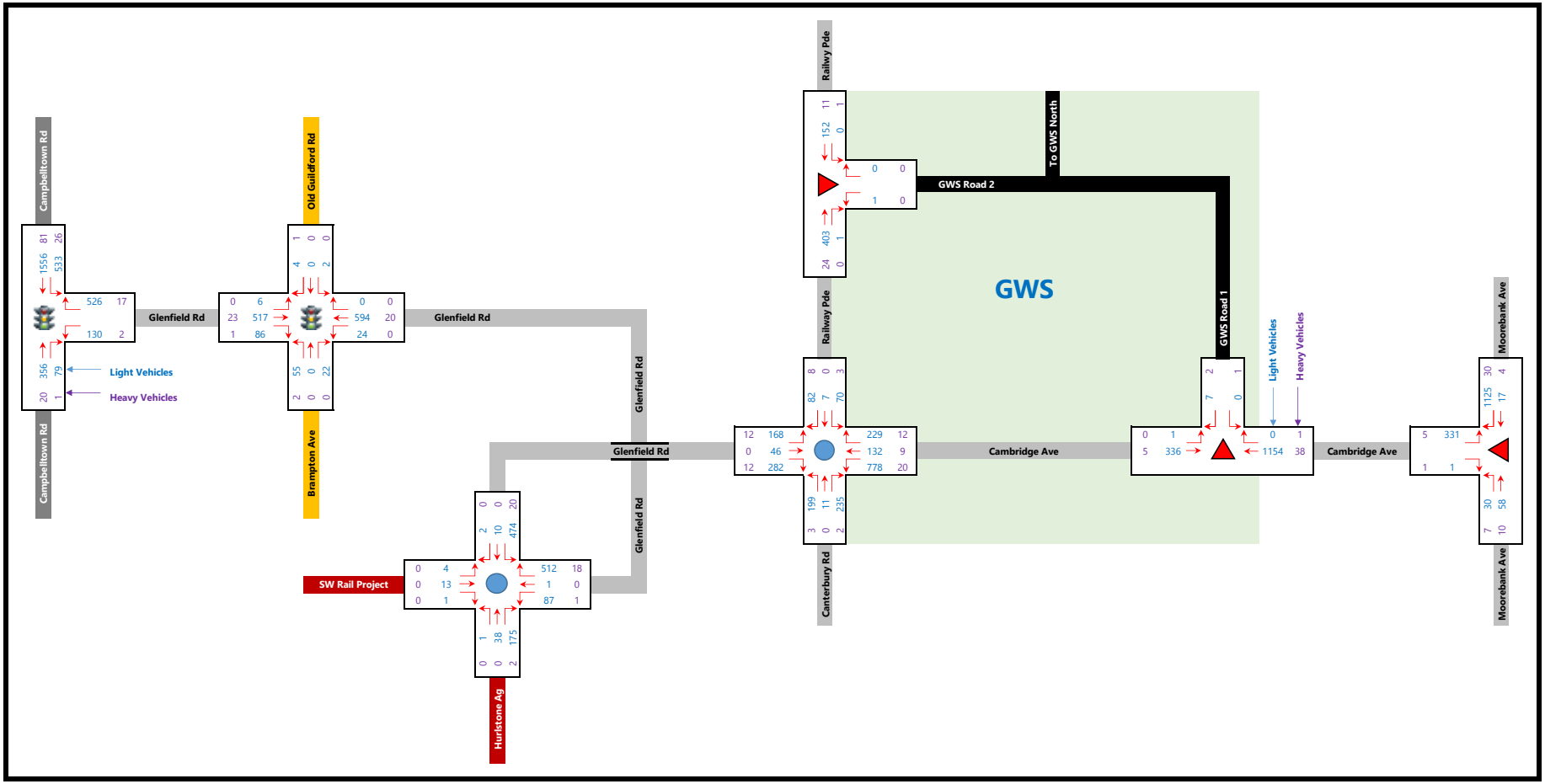


Figure 2.3.2 Existing PM 4:00pm – 5:00pm



2.4 Existing Intersection Operations

2.4.1 SIDRA Intersection Model

In order to determine the current levels of service provided at the key intersections through the local road network, the RMS approved SIDRA intersection model been utilised to determine current intersection operations. The SIDRA inputs includes peak hour traffic flows and speed profiles, intersection geometry and operational controls, and in turn SIDRA reports the following key performance measures: -

- **Level of Service**

  Level of Service (**LoS**) is a basic performance indicator assigned to an intersection based on average delay. For signalised and roundabout intersections, LoS is based on the average delay to all vehicles, while at priority controlled intersections LoS is based on the worst approach delay. The RMS LoS criteria, which have been used in the assessment, are provided below: -

Level of Service (RMS)	Control delay per vehicle in seconds (d) (including geometric delay)		
	Signals and Roundabouts	Rating	Stop and Give Way / Yield Signs
A	d < 14.5	Good	d < 14.5
B	14.5 < d < 28.5	Good with acceptable delay	14.5 < d < 28.5
C	28.5 < d < 42.5	Satisfactory	28.5 < d < 42.5
D	42.5 < d < 56.5	Near capacity	42.5 < d < 56.5
E	56.5 < d < 70.5	At capacity	56.5 < d < 70.5
F	70.5 < d	Over capacity	70.5 < d

- **Delay**

  Delay represents the difference between interrupted and uninterrupted travel times through an intersection, and is measured in seconds per vehicle in this assessment. Delays include queued vehicles accelerating and decelerating from/to the intersection stop, as well as general delays to all vehicles travelling through the intersection. With reference to the LoS criteria above, the average intersection delay for signals and roundabouts represents an average of delays to all vehicles on all approaches, while for priority intersections the average delay for the worst approach is used.

- **Degree of Saturation**

  Degree of Saturation (**DoS**) is defined as the ratio of demand (arrival) flow to capacity. DoS above 1.0 represent over-saturated conditions (demand flows exceed capacity) and degrees of saturation below 1.0 represent under-saturated conditions (demand flows are below capacity). The capacity of the movement with the highest DoS is reported.

The existing performance of key intersections is reported in **Table 2.4.1** below.

Table 2.4.1 Existing Intersection Performance

2014 Existing Conditions	Level of Service		Average Deelay (s)		Worst Delay (s)		Degree of Saturation		Queue (m)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
GWS Road 1 & Cambridge Avenue	F [A]	C	0.7	0.3	77.4	31.7	0.66	0.62	5.0	1.9
GWS Road 2 & Railway Parade	A	A	0.5	0.4	6.9	6.1	0.10	0.19	4.4	8.1
Cambridge Avenue & Moorebank Avenue	A	E [A]	5.4	6.5	8.9	58.2	0.76	0.71	60.6	66.8
Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade	A	A	9.8	7.2	19.0	11.1	0.60	0.34	33.6	13.0
Glenfield Road & Hurlstone College & South West Rail Access	A	A	6.6	7.6	12.2	12.6	0.64	0.37	48.3	18.0
Glenfield Road & Brampton Avenue & Old Glenfield Road	B	B	24.8	26.2	37.6	35.2	0.71	0.56	146.7	103.2
Glenfield Road & Campbelltown Road	B	B	28.5	23.7	68.6	80.7	0.54	0.57	116.9	144.0

2.4.2 Intersection Performance Summary

- In general, the intersection analysis indicates that most of the local intersections operate at a good LoS, with low average delays and moderate spare capacity; this is particularly the case at the two roundabout intersections and – simply as a factor of low traffic flows – the intersection of GWS Road 2 & Railway Parade.

- The intersection of GWS Road 1 & Cambridge Avenue reports a poor LoS "F" in the AM. This LoS relates to the high delay experienced by a handful of heavy vehicles assigned to the right turn GWS Road 1 to Cambridge Road; with a high gap acceptance attributed to heavy vehicles, and the weight of the eastbound flow in Cambridge Avenue, these delays are quite significant, though the length of queue (95%ile length of 5.0m) more appropriately quantifies the actual "impacts" of this delay.

  The existing AUR turn treatment – though recently 'superseded' in the AustRoads standards by the **CHR (Short)** – remains in our opinion a more than appropriate turn treatment. The modelling indicates that the queue for the right turn to GWS Road 1 utilises a fraction of the available "turn" area provided by the AUR, such that through trips (westbound) are rarely inconvenienced (and certainly not delayed) by needing to use the passing lane. Sight distance on the approach to the intersection from the east is also good, with the up-grade reducing vehicle speeds.

- The intersection of Cambridge Avenue & Moorebank Avenue similarly reports LoS "E" in the PM, but this delay also relates to a very small number of vehicles turning right from Cambridge Avenue to Moorebank Avenue; as for the intersection of GWS Road 1 & Cambridge Avenue, this has no impact on the broader operation of the intersection, nor generates a queue such as would impact the movement of the left turn Cambridge Avenue to Moorebank Avenue.

- The signalised intersections of Glenfield Road with Campbelltown Road, and with Brampton Avenue & Old Glenfield Road, both operate at a good LoS.

2.5 The Cambridge Avenue Causeway

While the performance of key intersections (as assessed in **Section 2.4** above) is generally the most significant consideration in determining the capacity of a road network, general lane capacity can also be important, particularly when there are constraints to the immediate or efficient provision of additional lane capacity. The Causeway represents such a constraint, though it must be noted that the impact of a closure of the Causeway due to flooding is perhaps a more significant driver for the Causeway to be replaced at this time.

2.5.1 Recent History

The "need" for an upgrade of the Causeway has long been a subject of debate, particularly as the route via Cambridge Avenue to Moorebank Avenue (and vice versa) has become such a significant sub-regional link between Campbelltown and Moorebank/Holsworthy/Liverpool. Moreover, when flooded and therefore closed to traffic, the +1,500vph currently using the Causeway in the AM and PM can have a significant impact on other diversionary routes.

To summarise all the proposals, reports, recommendations and responses in regard to the upgrade of the Causeway – even if taking only a snapshot of the past 5 years - would run to dozens of pages, but it remains the case that funding, or at least an appropriate funding mechanism, has yet to be found which would provide for an upgrade. CC Council (and LC Council) have long sought State Government assistance, but this has not been forthcoming to date; rather – and perhaps offering some shorter term potential – the provision of a high level bridge has more recently been specifically linked to the development of the Intermodal, i.e. as a piece of infrastructure required as part of the broader Intermodal operations.

Given that current Intermodal traffic assessments report virtually no Intermodal trip generation to the south (i.e. to the Causeway) this is far from assured (see **Section 5.6** and **Appendix D.6**).

CC Council has provided ARC with a copy of the Report for Cambridge Avenue High Level Bridge Strategic Concept Design and Cost Estimate (**Bridge Report**) prepared by GHD in 2009 for CC Council and the RMS. While earlier proposals referenced a two lane bridge, the Bridge Report examined a four lane bridge that could accommodate future traffic increases as well as a higher bridge to ensure separation from peak flood levels. It is noted that some of the proposals examined in Bridge Report restrict access to GWS Road 1; our more recent discussions with the authors of the Bridge Report further suggest that a more detailed [future] assessment may determine that the bridge be required to extend even further to the west (i.e. further across the GWS Road 1 intersection).

One of the four bridge options assessed in the Bridge Report is reproduced below.

Figure 2.5.1 Potential High Level Bridge (Option 2)

Source: Bridge Report

Contrary to these investigations, it has very recently been reported that the Department of Defence (**DoD**) has examined the closure of Cambridge Avenue west from Moorebank Avenue. While the DoD has publicly stated that the closure is only one option under investigation as it largely relocates from the Moorebank area, such a closure would have broad impacts throughout the sub-region, and would certainly require detailed review.

2.5.2 Recent Causeway Statements

Some of the most pertinent [recent] reports regarding the Causeway are provided for reference below.

- CC Council Civil Works Report April 2009

  Council continues to be involved in a number of areas to gain funding commitments from Government for the provision of a high level bridge and the safe operation of the existing causeway…correspondence has also been received from the Minister for Roads, Michael Daley MP, regarding the provision of a high level bridge to replace the present causeway crossing. The Minister states that advice provided by the Roads and Traffic Authority (RTA) is that upgrading of the causeway bridge requires serious consideration as part of the transport access options for the proposed Moorebank Inter-modal Terminal.

  The Minister has confirmed the Department of Defence has recently written to the RTA offering an easement on the east bank of the Georges River to construct the bridge and associated works…The RTA has informed the Minister that they will liaise further to progress this issue on behalf of all tiers of government when planning and funding for the Moorebank Inter-modal Terminal becomes more advanced and funding sources for the provision of the Cambridge Avenue high level bridge has been identified.

- CC Council Civil Works Report July 2010

  Council has been advised that to facilitate the planning process, a Moorebank Project Office is being established to manage the detailed planning and approvals for the intermodal terminal, in consultation with all levels of Government, as well as the local community. It is advised that the Project Office will also consider land transport issues such as the provision of a high level bridge at Cambridge Avenue in the detailed planning.

- Response in the NSW Parliament to Dr Andrew McDonald from the Minister for Roads 2009

  …any upgrade to Cambridge Avenue, including a possible high level bridge across the Georges River, must be considered in conjunction with the transport impacts of the proposed conversion of the Moorebank Defence Lands to civilian use, including the construction of a large intermodal terminal on part of the site…Under the Nation Building Program, the Federal Government has set aside $300 million for development of an intermodal freight terminal at Moorebank, including road and rail connections to the terminal. Pending completion of feasibility and scoping studies for the terminal, it is not possible to make any definitive statement on the future role and standard of Cambridge Avenue.

- Response in the NSW Parliament to Dr Andrew McDonald from the Minister for Roads 2010

  The Government has no current plans to construct a high level bridge to replace the causeway. However, pending completion of feasibility and scoping studies for the proposed intermodal terminals at Moorebank, it is not possible to make any definitive statement on the future role and standard of Cambridge Avenue.

- Amanda Partridge, Macarthur Chronicle Campbelltown, September 2013

  THE fate of Cambridge Ave, Glenfield, is still unclear as the Department of Defence confirms it is looking into options amid a planned move to Holsworthy and West Wattle Grove…A Defence Department spokesman told the Chronicle no decision had been made yet.

  "*There are a number of Commonwealth owned roads in the Moorebank area, including a portion of Cambridge Ave,*" *he said. "These roads were originally built for Defence purposes and are also open to the public… Defence is assessing its required [sic] use of these roads and will liaise with relevant stakeholders, prior to any decisions being made, including on whether it would be more appropriate for such roads to be transferred to the relevant state or local authority.*"

In summary, there is no question that the Causeway will need to be replaced by a bridge if a trafficable "all-weather" link is to remain via Cambridge Avenue to/from Moorebank Avenue. The dual issues of flooding and traffic appear to point inevitably to a four lane high level bridge as providing the only viable option to address both issues appropriately, as does the underlying impression (with reference to the quotes above) that the bridge would be required by the Intermodal.

2.5.3 Causeway Capacity

The operational capacity of a traffic lane in an urban environment varies significantly based on a number of factors, including terrain, vehicle types, intersection/turning demands and carriageway and verge width amongst others. While nominal lane capacity is therefore quantitative to a degree, it must also be partially subjective; traffic flows that breach a nominal capacity will not necessarily or automatically trigger the implementation of additional capacity when costs and other factors are considered – the Causeway is an excellent example of such.

The 2010 Highway Capacity Manual (**HCM**) states that the capacity of a two-lane road is 3,200vph, but only under what are very favourable conditions; wide lanes and verges, flat terrain, no heavy vehicles, and an even directional split. These are not characteristics of the Causeway – application of HCM (or the similar AustRoads Guide to Traffic Engineering Practice: Part 2 – Roadway Capacity) capacity equations suggests a substantially lower two-way capacity for a section of road such as the Causeway.

Conversely, Cambridge Avenue for all but the Causeway provides almost ideal conditions by which to achieve theoretical capacity – wide lanes, wide verges and [certainly west of the Causeway] flat terrain, and significant separation from intersections.

A good example of the actual [and indeed current] capacity of the Causeway - and no doubt there are many similar examples - is provided by [the, albeit recently, upgraded] Windsor Road between Pitt Town Road and Richmond Road. A study prepared for Hawkesbury Council showed that the [then] very narrow two lane bridge across the Hawkesbury River was in the peak hours carrying flows in excess of 1,650vph per lane (with a similar tidal demand to that evident at the Causeway).

The real issue for investigation in such circumstances generally remains the capacity of adjacent intersections where opposed flows fundamentally reduce capacity. As such, the provision of additional approach lane capacity at either end of the narrow Windsor Road section resulted in generally good levels of service at the bookend intersections in the peak hours, and as such consideration of the significant single lane traffic flows was largely immaterial. Observations and traffic surveys during the peak periods certainly confirm the high tidal flows across the Causeway, but nonetheless the distance available between the Causeway and the bookend intersections to the east and west, and the lack of delays to the primary tidal movements at those intersections, means that the high tidal lane flows across the Causeway generally…flow.

There is of course a further area which requires investigation in the case of the Causeway – whether the mix of high flows and tight geometry are contributing to proportionally higher accident rates. This issue is examined below.

2.6 Crash Data

The RMS has provided crash data to ARC for the period 2008 – 2013, and is presented in full in **Appendix B**. A summary of the data is provided below.

2.6.1 Cambridge Avenue

Cambridge Avenue reports 24 crashes for the period 2008 – 2013, with 16 injury crashes (reporting 20 injuries) but no fatalities. Only 4 crashes were attributed to speeding, which given the long and straight segment of Cambridge Avenue east from Canterbury Road is perhaps a lower proportion than anticipated. The most common incidents were rear-end crashes (9) primarily on the approaches to Canterbury Road and to Moorebank Avenue, followed by opposing vehicle (turning) crashes (4) and off-road crashes (4).

Additionally: -

- 6 crashes are reported between 200m and 500m east of Canterbury Road, i.e. immediately adjacent to the Site, with a further single crash (off-road) 25m west of the Causeway
- 4 crashes at the intersection of Cambridge Avenue & Canterbury Road & Railway Parade & Glenfield Road
- 8 crashes in Cambridge Avenue between the Causeway and Moorebank Avenue, primarily rear-end crashes on the approach to Moorebank Avenue
- 6 crashes at the intersection of Cambridge Avenue & Moorebank Avenue
- No crashes at the intersection of Cambridge Avenue & GWS Road 1
- No crashes on the Causeway

As reported above, the crash data reports a single accident in the immediate vicinity of the Causeway, while others are reported as being at such significant distance from the Causeway such that the Causeway is unlikely a factor. Notwithstanding, ARC notes that the Bridge Report specifically raises the issue of road safety at the Causeway: -

> *In addition, a number to serious crashes have been recorded at the approaches to the Causeway in recent years. As a result, the Causeway has developed a poor accident history.*

It is difficult to determine what may have changed in recent years to alter the prevalence of incidents at the Causeway, particularly given that available traffic data suggests little change in traffic flows over the past 5 – 10 years; certainly there is a [pre-2008] record of numerous incidents, including a fatal accident involving an emergency services vehicle in 2006. It must therefore be acknowledged that the existing capacity and design conditions discussed in **Section 2.5.3** can only increase the potential for incidents compared to other locations with similar flows but wider lanes/verges, even if such incidents have not been specifically reported in recent years.

2.6.2 Glenfield Road

Glenfield Road reports 50 crashes for the period 2008 – 2013, the majority being at the intersection of Campbelltown Road. The 25 injury crashes resulted in 25 but no fatalities. 8 crashes were attributed to speeding, and a further 6 to fatigue. The most common incidents were rear-end crashes (16) primarily on the approaches to the Campbelltown Road & Glenfield Road intersection, as well as adjacent approach crashes (7) and a smaller number of opposing vehicle (turning) crashes (4).

Additionally: -

- 5 crashes are reported at the intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road, the majority of which relate to right turn conflicts
- 21 crashes are reported between Campbelltown Road and Canterbury Road, with a variety of crash types including off-road, rear-end, head-on and out of control on bend; many of the crashes are in close proximity to Campbelltown Road, Brampton Avenue, and the Glenfield Road overpass
- 20 crashes are reported at the intersection of Campbelltown Road & Glenfield Road
- 4 crashes at the intersection of Cambridge Avenue & Canterbury Road & Railway Parade & Glenfield Road

As for Cambridge Avenue, this is not an enviable crash record, though away from key intersections, and with only a small proportion of crashes attributable to speed, fatigue or road conditions, it is difficult to pinpoint why so many accidents have occurred in what is generally a well-defined moderate speed environment.

3 Public Transport, Pedestrian & Cycle Access

3.1 Rail services

Glenfield Railway Station is located approximately 1km south-west of the Site (at Railway Avenue), though closer to 2km from the existing Site offices near GWS Road 1. Glenfield Station is located at the interchange of three railway lines, including:

- The South Line (Campbelltown to City Circle via Granville)
- The Cumberland Line (Campbelltown to Blacktown)
- The Airport and East Hills Line (Macarthur to City Circle via East Hills and Sydney Airport)

Glenfield Station provides medium – high frequency services across the day. Services on the South and Airport/East Hills lines operate with a 10 minute frequency in each direction, while services on the Cumberland line generally operate with a 30 minute frequency in each direction.

In 2009, the NSW Government announced the construction of a new 11 kilometre rail line – the South West Rail Link (**SWRL**) from Glenfield to Leppington in South West Sydney. The SWRL – currently nearing completion - included upgrades to Glenfield Rail Station and the line itself as it passes through the Site. Upon completion, the total number of services through Glenfield Station during the weekday peak hour is estimated to increase from 8 to 12; and by 2020, the number of services is forecast to rise to 20 during the weekday peak hour.

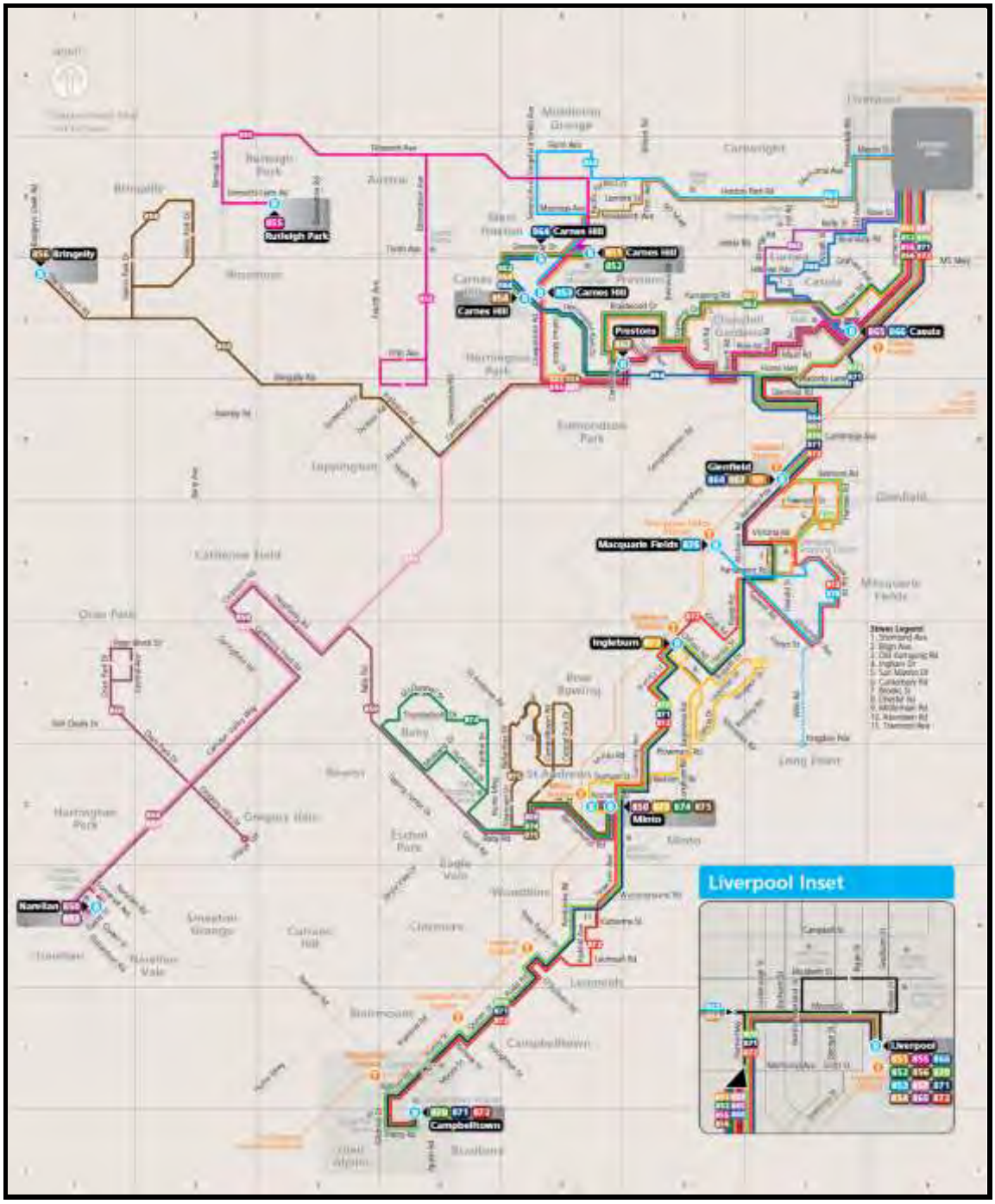
Complementing the increased services is the [largely completed] Glenfield Transport Interchange, which comprises an upgrade to Glenfield Station to accommodate the introduction of the SWRL, as well as the construction of a multi-storey commuter car park. The upgrade also includes changes to Railway Parade to specifically offer enhanced interchange opportunities through: -

- New bus facilities, including priority bus measures
- Increased provision for kiss and ride
- Improved pedestrian crossing opportunities
- Widening of the Railway Parade cycle lanes to 1.5 metres

3.2 Bus services

Bus services in the Glenfield area are provided by Interline, with routes operating past the intersection of Railway Parade & GWS Road 2, with bus stops located approximately 300m south in Railway Parade. These bus routes are shown **Figure 3.2** below.

Figure 3.2 Glenfield Bus Routes



Source: TNSW

With reference to **Figure 3.2**, available routes via Glenfield Station and Railway Parade include: -

- Route 864 Carnes Hill – Glenfield via Horningsea Park
- Route 867 Prestons – Glenfield via Prestons
- Route 870 Campbelltown – Ingleburn – Liverpool via Glenfield
- Route 871 Campbelltown – Ingleburn – Liverpool via Glenfield
- Route 872 Campbelltown – Ingleburn – Glenfield – Liverpool via Macquarie Fields

In general, these bus routes provide half hourly services to/from Glenfield during the peak periods. **No bus services utilise Cambridge Avenue**.

The *South West Sector Bus Servicing Plan* identifies a short term and long term bus route that will also travel in the vicinity of the Site. The short term proposed bus service would travel between Glenfield Station and Ingleburn via Canterbury Road and Glenfield Road, while the long term bus route would also travel along Canterbury Road and Glenfield Road between Glenfield Station and Leppington (every 15 minutes in the peak periods).

3.3 Pedestrian Access

Minimal pedestrian facilities are currently provided in the vicinity of the Site, being instead limited to the populous area to the west of the Site in Railway Parade and Canterbury Road, providing for pedestrians in more immediate proximity to Glenfield Station and the surrounding village centre and residential areas.

CC Council has a footpath improvement program in place to identify areas of path which need to be replaced, as well as determine where new footpaths could be provided to achieve maximum use. CC Council uses a weighting system to assess which areas of footpath to upgrade, as well as where new footpaths should be situated; it is unlikely that Cambridge Avenue would [under current or proposed usage] qualify for such paths.

3.4 Cycle Access

The Site is well located in terms of opportunities for cycling, being located in [relatively] close proximity to the Liverpool-Parramatta Rail Trail and the M7 Motorway Cycleway. Notwithstanding, there are limited cycle provisions in the local area, and no local designated on or off road cycle paths (though it is noted that the most recently available CC Council *Bike Plan* from 2010 suggests cycle paths are located in Cambridge Avenue, Canterbury Road and Glenfield Road). Certainly most local roads (other than the Causeway and the Glenfield Road over-bridge) are available to accommodate cyclist on-road.

The potential exists for more cycle paths to be defined in coming years, and to link to new sub-regional routes currently being planned, but based on our discussions with CC Council no new bike plan is currently available for review, and a detailed copy of the 2010 *Bike Plan* is not available due [per CC Council] to inconsistencies in the 2010 *Bike Plan*.

3.5 Summary

Notwithstanding the excellent public transport services available within 800m of Glenfield Station, it must be acknowledged that the nature of the work undertaken at the Site (both currently and further to the Proposal) has little potential to create (or attract) a significant number of public transport, walk or cycle trips until such time as bus services are provided along Cambridge Avenue.

The only real potential for reduced vehicle usage in the short term would be in regard to staff trips, but again the considerable distance from the [central portion of the] Site to either Glenfield Station or to bus stops in Railway Parade – paired with generally earlier industrial work start times when many services (and specifically bus services) operate at a lower headway – means that any real mode shift is unlikely in the short term.

This should change in the future. While regular bus routes are unlikely to utilise Cambridge Avenue given the [current] low patronage levels in Glenfield and Moorebank – and potentially due to the Causeway limitations - developments such as the Intermodal provide excellent opportunities for bus services to link between Glenfield Station and Moorebank Avenue and then Liverpool, and as such operate directly past the Site. It is anticipated that future Development Applications would specifically reference any changes in the sub-region such as would provide for bus access past the Site, and further thence development Site specific travel plans to promote public transport use.

4 The Proposal

4.1 Industrial Rezoning

GWS proposes the rezoning of the majority of the southern portion of the Site so as to permit industrial [warehouse] development

4.1.1 Development Yield

Of the 60ha southern portion of the Site considered in the Proposal, certain areas have been identified as being most likely not appropriate for future traditional industrial development; these areas include: -

- Approximately 12ha of land south of Cambridge Avenue (due to the transmission easement)
- Approximately 3ha of land adjoining the Georges River
- Approximately 15 hectares of landfill that includes the area between the East Hills Railway Line and the CC Council LGA boundary (this area may facilitate ancillary land uses);
- Approximately 2 hectares for setbacks, buffers, open space and infrastructure, including required setbacks to existing rail lines.

As a result, the total amount of developable area considered in the Proposal is approximately 28ha, with approximately 16.42ha to be developed at a density of 1:1 Floor Space Ratio (FSR); and approximately 11.26ha developed at a density of 0.3:1 FSR. This is estimated to yield some 198,000m^2 GFA of industrial space".

The land considered for rezoning is shown in **Figure 4.1.1**, while information in regard to lot yield is provided in **Table 4.1.1**.

Figure 4.1.1 Proposed Rezoning Areas

Source: EPS

Table 4.1.1 Proposed Yield

Lot	Area Ha	Developable	Setbacks & Roads		Developable Land Area		FSR	Floor Sace Area - Net Developable
1	5.6	Yes	25%	14,000	75%	42,000	1.0 : 1	42,000 m²
2	5.8	Yes	25%	14,500	75%	43,500	1.0 : 1	43,500 m²
3	4.5	Yes	25%	11,250	75%	33,750	1.0 : 1	33,750 m²
4	3.6	Yes	25%	9,000	75%	27,000	1.0 : 1	27,000 m²
5	2.4	Yes	25%	6,000	75%	18,000	1.0 : 1	18,000 m²
6	15	light	25%	37,500	75%	112,500	0.3 : 1	33,750 m²
7	2.4	No	0%	-	0%	-	0.0 : 1	- m²
8	14.7	No	0%	-	0%	-	0.0 : 1	- m²
9	5	No	0%	-	0%	-	0.0 : 1	- m²
	59.0					37.68		198,000 m²

Source: EPS

4.1.2 Proposed Industrial Land Use

The primary land-use proposed for the rezoned portion of the Site is for large scale industrial warehouse development; this type of development is expected to specifically capitalise on the potential local employment/employees; good accessibility of the Site to the sub-regional and regional road network; the excellent potential for future public transport services in Cambridge Avenue connecting Glenfield and Liverpool; and the proximity of the Site to the proposed Intermodal immediately east of the Site.

4.2 Access

As discussed in **Section 1.3.1**, access to the existing GWS operations in the north portion of the Site, and for the SSD Proposal, will remain via the intersection of GWS Road 1 & Cambridge Avenue. Departure from the landfill operations in the north of the Site will also remain via GWS Road 1 to Cambridge Avenue, while departures for the SSD Proposal will be via GWS Road 2 to Railway Parade.

The trip generation of the existing and proposed waste management and recycling facilities further to the SSD Proposal is relatively minor, and as determined in the **SSD TIA** can be accommodated by these existing intersections (see also **Section 5.5** and **Appendix D.5**). However, these existing intersections, and specifically GWS Road 1 & Cambridge Avenue, have little scope to accommodate any significant level of additional trips operating as a priority intersections, and the gradient through the intersection of GWS Road 1 & Cambridge Avenue, paired with the potential for a future bridge to extend past this location (as per **Section 2.5.1**), suggests there is little opportunity for an upgrade.

As such, the Proposal will require a new intersection to Cambridge Avenue.

A new access road (termed **GWS Road 3** for ease of reference) is proposed to intersect Cambridge Avenue, likely at a mid-point between GWS Road 1 and Canterbury Road; the distance between these existing intersections is some 900m, so that a new intersection would be able to provide appropriate separation.

At this time, it is anticipated that the resulting intersection would be provided as a roundabout, with a design incorporating the potential for a southern approach accessing parking [or other complying active uses] on the land south of Cambridge Avenue, which forms part of a transmission easement and is accessible to the main part of the Site via an existing underpass below Cambridge Avenue (see **Figure 1.1.2** for location of underpass). It is noted that the use of the land south of Cambridge Avenue would necessarily be the subject of a future rezoning/development application, and is not part of this Proposal.

The final location and design of the intersection would be subject to detailed studies as part of the future Development Application process. Importantly, there is the potential for changes to the local road network in the short term (see **Section 5**), and as such it will be essential for future traffic assessments accompanying Development Applications for the Site to appropriately include such changes (where defined) in future intersection planning.

4.3 Traffic Generation

4.3.1 Warehouse & Distribution Traffic Generation

In determining the traffic generation potential of the Proposal ARC has reference the RMS Guide Update which provides specific survey data for a number of industrial and warehouse sites across the Sydney metropolitan area. Further to a review of the available survey data available and on-site observations, it has been determined that the Erskine Park Industrial Estate reported in the RMS Guide Update has characteristics that best correspond to the Proposal, including: -

- Similar location with regard to both regional road access and distance from the Sydney CBD and Parramatta CBD
- Adjacent residential precincts
- The almost exclusive provision of warehouse space as opposed to commercial, industrial (manufacturing) or office spaces
- The limited availability of public transport at this time, resulting in a higher mode split to private car travel

In addition, the Erskine Park Industrial Estate is the oldest (and therefore most settled in regard to traffic) of the surveys estates; and – at the time of the surveys – highest occupied of all the industrial sites surveys.

The RMS Guide Update provides the following peak period generation rates for the Erskine Park Industrial Estate: -

- Peak [Site] Trip Generation 0.163 trips per 100m^2
- AM Trip Generation 0.134 trips per 100m^2
- PM Trip Generation 0.139 trips per 100m^2

Based on these trip generation rates, the Proposal would generate: -

- Peak Site generation of approximately 320vph
- AM generation of 269vph
- PM generation of 279vph

These trip estimates also conform to the original generation forecasts for [precincts of] the Erskine Park Industrial Estate, which were calculated with reference to *trips per hectare* in the Western Sydney Employment Hub - Proposed Erskine Park Link Road Network Traffic Study (**WSEH Study**) prepared for the RTA by Maunsell Australia Pty Ltd. The WSEH Study adopted a rate of 9 peak hour trips per hectare, specifically to reflect the lower trip generation of warehouse development. Application of 9 peak hour trips per hectare to the Proposal results in a generation estimate of 252vph, again a similar trip total to that calculated with reference to the more recent RMS Guide Update.

ARC has adopted the RMS Guide Update flow forecasts for the assessment of the Proposal.

Briefly, the SSD Proposal will occupy some 5ha of the rezoned land, but the potential exists to relocate the Facility to the northern portion of the Site at some time in the future; this means the potential exists for the entire [developable] 28ha to be generating industrial trips, at the same time as the SSD Proposal producing peak trips.

Until such a relocation, the Site would actually generate fewer total trips than indicated above, as the application of the industrial trip generation rates to 5ha results in a higher number of trips than would be generated by the Facility occupying that same 5ha. This is particularly the case in the PM when the SSD Proposal would generate 30vph – 40vph less than the same area developed for industrial purposes – the total Site generation further to the Proposal with the Facility occupying 5ha of the rezoned land would be closer to 250vph in the PM.

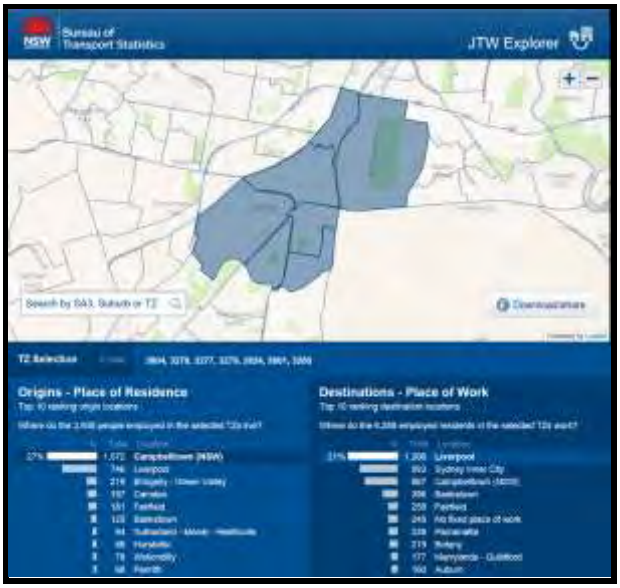
Notwithstanding – and given the potential for the Facility to be relocated at a future date – the assessment provides for the separate generation totals of the Proposal and SSD Proposal so as to provide a maximum Site generation.

4.4 Trip Distribution

4.4.1 Employee Trips

A review of 2011 Journey to Work (**JTW**) data for the travel zones surrounding the Site suggests that staff trips will be weighted to the west, and specifically to Campbelltown and the south-west, as shown below.

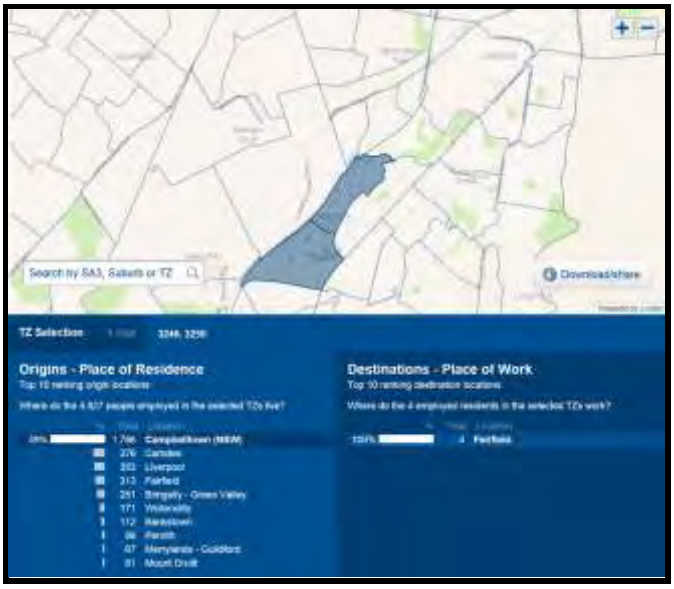
Figure 4.4.1.1 Journey to Work Data – Glenfield and Surrounds



Source: BTS

A review of JTW data for the Ingleburn Industrial Precinct just south of the Site shows a very high percentage of staff trips generated to and from the south and south-west, and as such the retention of industrial employment within the Campbelltown LGA.

Figure 4.4.1.2 Journey to Work Data – Ingleburn Industrial Precinct



Source: BTS

In line with these JTW data sets, it is expected that a majority of staff trips will be generated to and from west of the Site, including trips to/from the south, south-west, north and north-west. With reference to the area of investigation in this TIA, the following distribution has been used: -

- 35% of trips to the East, of which: -
  - 100% via Moorebank Avenue, of which: -
    - 20% north via Moorebank Avenue
    - 15% east via M5

- 65% of trips to the West, of which: -
  - 20% from Canterbury Road in the AM
  - 15% from Campbelltown Road (south) in the AM
  - 30% from Campbelltown Road (north) in the AM of which: -
    - 15% from Hume Motorway
    - 10% from M7
    - 5% from Camden Valley Way
  - 20% to Canterbury Road in the PM
  - 30% to Campbelltown Road (south) in the PM of which: -
    - 15% to Hume Motorway
  - 15% to Campbelltown Road (north) in the PM of which: -
    - 10% to M7
    - 5% to Camden Valley Way

4.4.2 Heavy Vehicle Trips

The distribution of heavy vehicle trips is not as easily forecast as staff trips, and will to a large extend depend on the future Site operators. Notwithstanding, given the potential for the Site to provide [independent but] ancillary operations for the Intermodal, it is estimated that the distribution of heavy vehicle trips would be similar to that forecast for the Intermodal, with the majority of heavy vehicle trips distributed to the north-west, west and south of the Site.

The following heavy vehicle distribution has been used: -

- 20% of trips to the East, of which: -
  - 100% via Moorebank Avenue, of which: -
    - 15% north via Moorebank Avenue
    - 5% east via M5

- 80% of trips to the West, of which: -
  - 10% from Canterbury Road in the AM
  - 15% from Campbelltown Road (south) in the AM
  - 55% from Campbelltown Road (north) in the AM of which: -
    - 30% from Hume Motorway
    - 20% from M7
    - 5% from Camden Valley Way
  - 10% to Canterbury Road in the PM
  - 45% to Campbelltown Road (south) in the PM of which: -
    - 30% to Hume Motorway
  - 25% to Campbelltown Road (north) in the PM of which: -
    - 20% to M7
    - 5% to Camden Valley Way

4.4.3 Arrival & Departure Distribution

In the AM, it is estimated that some 80% of employee vehicle trips would be inbound, with 20% outbound. In the PM, this distribution would be reversed, with 20% of employee trips being inbound and 80% outbound.

In the AM and PM, it is estimated that heavy vehicle trips would generally be split between inbound and outbound trips.

4.5 Trip Assignment

The trip generation determined in **Section 4.3** has been assigned to the road network in accordance with the distribution profile outlined in **Section 4.4** above. The resulting traffic flows generated by the Proposal through the road network are shown the following figures: -

- **Figure 4.5.1 AM Site Generation**
- **Figure 4.5.1 PM Site Generation**

Figure 4.5.1 Future AM Site Trips

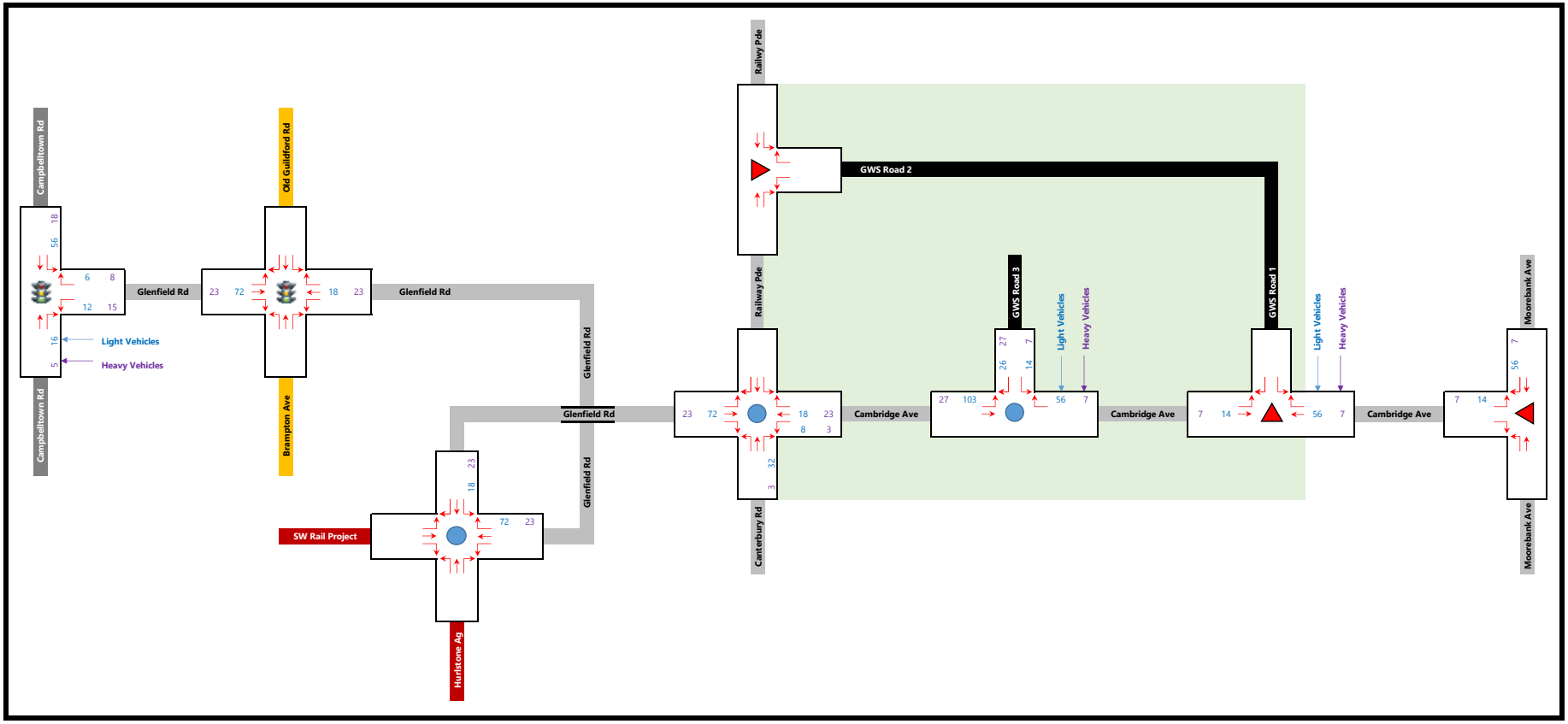
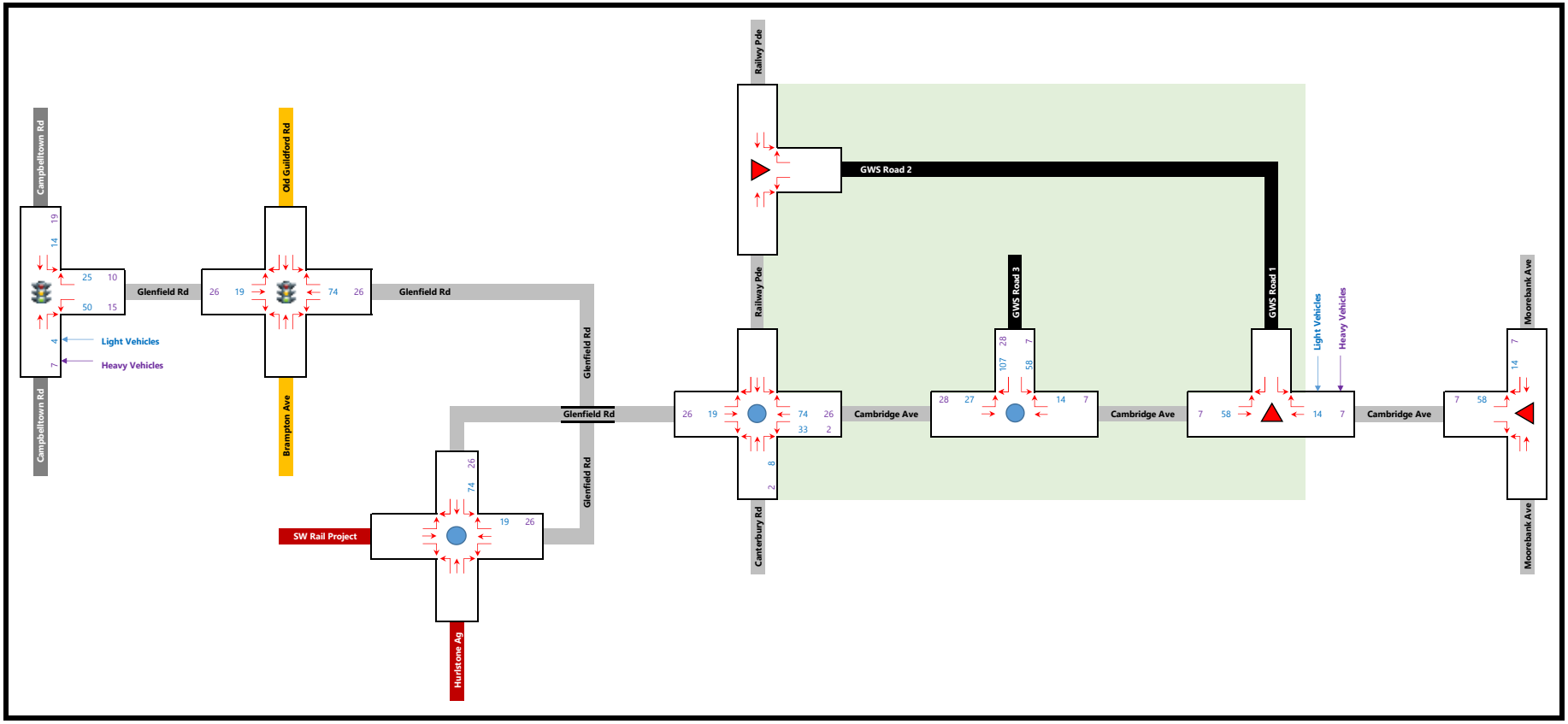


Figure 4.5.2 Future PM Site Trips



5 Sub-Regional Projects

Appendix D provides a detailed assessment of the numerous sub-regional developments/projects which have the potential to impact the road network to which the Proposal will generate additional trips. These are summarised below.

5.1 Glenfield Road Urban Release Area

The Glenfield Road Urban Release Area (**GRURA**) provides for the development of 1,100 residential dwellings, including 980 separate dwellings and 120 townhouse dwellings. All access from the GRURA is to Glenfield Road, with signalised intersections at Brampton Avenue & Old Glenfield Road; and at Atlantic Boulevard. A left in/left out intersection to Glenfield Road is also proposed (understood to be near Britannia Drive).

It is estimated that the fully occupied GRURA will generate some 820vph to/from Glenfield Road, of which approximately 50% would travel to the east and 50% to the west. Approximately 60% of trips are estimated to use the intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road, and 40% the intersection of Glenfield Road & Atlantic Boulevard once Atlantic Boulevard is connected through to the main part of the estate.

The resulting AM and PM trips generated by the GRURA are detailed in **Appendix D.1**.

5.2 Campbelltown Road Upgrade

The RMS is currently finalising plans for the Campbelltown Road **Upgrade**, which includes the intersection of Campbelltown Road & Glenfield Road. Further to discussions with the RMS and Council, funding for works at the intersection have been committed as part of the 'Pinch Point Program' and will commence in the short term.

Future traffic flow estimates at the intersection are provided in the Campbelltown Road Upgrade Review of Environmental Factors: Traffic and Transport Modelling Assessment (**CR TTMA**); provided for a year 2026, these increases are estimated to be largely evident by this TIA forecast year of 2024 (and have therefore been assessed in their entirety in this TIA).

Significant increases are forecast in the CR TTMA to through flows in Campbelltown Road generated by new residential activation precincts to the south of Glenfield Road. Conversely – and as discussed in detail with the RMS **Upgrade Project Team** – the assessment provided in this TIA (based on recent traffic surveys, and the assessment of the additional GRURA trip generation potential as per **Section 5.1** above) indicates turning flows to/from Glenfield Road that are much higher than forecast in the CR TTMA (see also **Appendix D.2**). This discrepancy – discussed at length with the Upgrade Project Team and CC Council – on the surface appears to be relate to the propose future Glenfield Link Road ;however, information provided to ARC by the RMS specifically states that this is not the case (see also **Section 5.4** below).

As a worst case, the forecast Campbelltown Road through flows provided in the CR TTMA have been paired with the higher Glenfield Road turning flows determined as part of this TIA. The resulting AM and PM trips generated at the intersection of Campbelltown Road & Glenfield Road are detailed in **Appendix D.2**.

5.3 Average Annual Growth

The developments described above, and specifically GRURA and residential activation precincts off Campbelltown Road south of Glenfield Road, are essentially "certain", and as such the trips generated by each will be evident in the forecast year 2024.

Conversely – and as discussed with Council and the RMS - average annual growth in and of itself through the local road network is expected to be very minor. Average Annual Daily Traffic (**AADT**) and Average Daily Traffic (**ADT**) data indicates almost no growth in flows through the local road network over the past +10 years; rather, growth is generated by targeted projects within the sub-regional such as those described above. As a result, only a minor (0.5% per annum) average annual growth factor has been applied through the forecast year 2024 (see also **Appendix D.3**).

5.4 Glenfield Link Road

CC Council has identified the potential for a new sub-arterial **Link Road** between Glenfield Road (in the vicinity of the railway overpass) to Campbelltown Road (likely to an intersection with Beech Road). CC Council has specifically linked the Link Road proposal with the development of the Intermodal, and it is our understanding that discussions with the [potential] future operators of the Intermodal in this regard are ongoing at this time. Link Road would potentially then also form part of broader works in the area including the bridge to replace the Causeway; and potentially a [major or minor] upgrade of Cambridge Avenue.

However, at this time there is no information to suggest the potential for Link Road to be developed within the 10 year TIA forecast period. Available Intermodal traffic assessments refute the potential for any significant flow to use the local road network and - as affirmed by CC Council and our discussions with the RMS Upgrade Project Team - there is no independent proposal to design or fund the Link Road in the near future.

With reference to Section 5.2 above – and the lower turning flows to/from Glenfield Road identified in the CTR TTMA - it is noted that future network assessed in the CR TTMA includes a new eastern approach to the Campbelltown Road & Beech Road intersection, which is where the Link Road is envisaged to meet Campbelltown Road. However, information provided by the Upgrade Project Team has specifically stated that this is not representative of the Link Road, but rather a new access for the Hurlstone Agricultural College (**HAC**) as stated in RMS Campbelltown Upgrade Supplementary Land Use and Socio-Economic Impact Assessment (Appendix E of the Upgrade documentation available on the RMS website): -

There is currently no access to the school from Campbelltown Road. The proposal would create a southern approach to the Beech Road intersection, which would facilitate improved access to Roy Watts Road in the future, thereby improving accessibility of the Hurlstone Agricultural High School.

This new access road has the potential to significantly reduce trips to the HAC via the roundabout off Glenfield Road (and in turn reduced trips from the west in Glenfield Drive, i.e. turning movements at the intersection of Campbelltown Road & Glenfield Road, but the Upgrade documentation does not provide any sub-regional modelling in regard to such reductions.

Notwithstanding, based on all available information the RMS proposal to provide access to the HAC only via a new approach to Campbelltown Road at Beech Road would appear to rule out the Link Road at this time (see also **Appendix D.4**)

5.5 GWS SSD Proposal

As discussed in numerous sections above, the SSD Proposal provides for the development of a Recycling Facility across some 5ha of the Site north of Cambridge Avenue. The SSD Proposal would allow for the recycling of some 385,000 tonnes per annum (**tpa**) of recyclable materials, and the continuation of landfill operations in the northern portion of the Site (65,000tpa). ARC has prepared a detailed TIA for the SSD Proposal, which is summarised in **Appendix D.5**.

Access to and from the landfill operations in the north of the Site would remain via the intersection of GWS Road 1 & Cambridge Avenue. Ingress to the Facility would also be via this intersection, with egress to the intersection of GWS Road 2 & Railway Parade.

Further to a detailed review of vehicle capacity data, it is estimated that the SSD Proposal (including both the landfill and recycling operations) would generate approximately 600 vehicle trips per day (**vpd**); some 50vph in the AM; and 20vph in the PM. A significant majority of vehicles would be heavy vehicles. It is estimated that trips will be equally distributed to the east and west through the day, with the only exception being staff trips which are weighted to/from the west.

With reference to vehicle access, trip generation and trip distribution, the assignment of SSD Proposal trips is detailed in **Appendix D.5**.

5.6 The Moorebank Avenue Intermodal

The final – and certainly most significant – sub-regional development proposal is the Intermodal, which is estimated to provide capacity of 1.7m containers per year, and be developed as either a joint enterprise or as separate operations. From a traffic and transport perspective, the distinction is not significant – all Intermodal vehicle trips would be generated to Moorebank Avenue, and then necessarily travel to/from the north or south.

This future trip distribution – to the north or to the south - is a key issue for discussion.

The 2013 SIMTA Transport and Accessibility Impact Assessment (**SIMTA TIA**) identifies the potential for some 50vph to be generated to/from Moorebank Avenue south of the 1M [container] Intermodal. Based on the fact that the SIMTA TIA assessed a 1M Intermodal, this generation might therefore proportionally increase to some 85vph based on a 1.7M Intermodal.

Based on sensitivity testing by ARC, 85vph would have little impact on the local road network through 2024 even further to the Proposal and SSD Proposal.

However, available information suggests that the 1.7M Intermodal could generate a significantly higher percentage of the estimated total peak hour generation of up to 1,800vph to the road network south and west of the Moorebank Avenue, as summarised below and assessed in detail in **Appendix D.6**.

5.6.1 Intermodal Trip Distribution

While trips between the Intermodal and many regional locations are more efficient via the **Regional Route** (which for ease of reference includes Moorebank Avenue, the M5, Hume Highway and Hume Motorway) the SIMTA TIA identifies very significant delays along the Regional Route upon the completion of the 1M Intermodal. In Moorebank Avenue for example, a PM northbound trip through Anzac Road and then to the M5 west is reported to incur average delays of some 7 minutes, and these delays appear to be little reduced even further to the implementation of all SIMTA TIA road network upgrade recommendations.

Under such circumstances, the **Local Route** (which for ease of reference includes Cambridge Avenue and Glenfield Road between Moorebank Avenue and Campbelltown Road) – which already provides comparable travel times for some SIMTA TIA identified trip demands to the south and south-west – must be considered a viable alternative; the route to the Hume Motorway south is a good example given the availability of the on-ramp from Campbelltown Road south of Glenfield Road.

There are also trips identified in the SIMTA TIA that are not only as efficient via the Local Route, but more legible also, particularly for staff trips. A high number of trips are identified travelling to/from the Hume Highway south of the M5, a route that would only be used to/from either Camden Valley Way or Campbelltown Road. With little identifiable demand for trips to/from Camden Valley Way, this can only suggest trips to/from Campbelltown Road, and necessarily trips to/from Campbelltown Road south of Glenfield Road. Even without the identified delays further to Intermodal operations, the Local Route again appears a more than viable route for these trips.

5.6.2 Local Route Vehicle Restrictions

The SIMTA TIA states that the Local Route is not accessible by heavy vehicles, and restricts the total trip distribution to the Local Route to 5% of [smaller] rigid vehicles. The Local Route however is accessible to all heavy vehicles that accord with the RMS *General Access Vehicle* classification, being up to 19m in length and less than 42.5t; further to discussions with the RMS and container transport companies, these limits are specifically considered in the allowance for container weights precisely so that containers can be transported using GAV routes.

It is the case that oversized RAV's are not permitted to use the section of Cambridge Avenue between Moorebank Avenue and GWS Road 1, but the SIMTA TIA estimates that only 30% of all articulated vehicles would be RAV's. All other articulated vehicles could potentially use the entire Local Route between Moorebank Avenue and Campbelltown Road.

5.6.3 Potential Intermodal Trip Generation to the Local Route

Further to consideration of the issues raised above, and with specific reference to the delays forecast in the SIMTA TIA along the Regional Route; and the delays forecast in the CR TTM and this TIA for the Local Route; an assessment of the potential Intermodal trip distribution to the Local Route can be identified. While full details of this assessment are provided in **Appendix D.6**, the assessment suggests the following: -

- The Local Route is estimated to provide faster trip times for trips to and from Campbelltown Road south of Glenfield Road in both the AM and PM; key Regional Route movement delays influencing this estimate include Hume Highway to M5 eastbound (over 160 seconds average in both peaks) and Moorebank Avenue to M5 westbound (283 seconds average in the PM).

- The Local Route is estimated to provide faster trips times for trips to the Hume Motorway via the Campbelltown Road on-ramp in the PM, based on the same Regional Route delays identified above, as well as the northbound delay in Moorebank Avenue through Anzac Road (120 seconds average delay).

In terms of trip generation, the assessment in **Appendix D.6** reports the resulting potential for significantly higher flows than estimated in the SIMTA TIA to use the Local Route during the AM and – to an even greater extent given the Hume Motorway on-ramp from Campbelltown Road – PM.

Necessarily, ARC has conducted sensitivity testing at key intersections along the Local Route, acknowledging the fact that the addition of Intermodal trips would itself increase delays along the Local Route. The assessment identifies a potential "tipping point" where the delays along the Regional Route further to a decrease in trips (diverting to the Local Route) may equal delays along the Local Route (further to an increase in trips diverting from the Regional Route). However, this finding relates only to a comparison of the [only available] SIMTA TIA delays along the Regional Route - i.e. based on a 1M Intermodal – while the Local Route analysis provided in **Appendix D.6** includes the potential trip generation of a 1.7M Intermodal.

5.6.4 Intermodal Summary

It is important that the findings outlined above (and detailed in **Appendix D.6**) are acknowledged as one potential outcome of the Intermodal development, particularly given that the Intermodal design and planning process is ongoing; and that without detailed Regional Route movement delays provided for a scenario with a 1.7M Intermodal and the implementation of all [SIMTA TIA] upgrade recommendations, it is not possible to provide a comprehensive route comparison.

Notwithstanding, even with all the SIMTA TIA recommended upgrades, the SIMTA TIA reports that average delays at the key intersections in Moorebank Avenue – and particularly at the M5 Interchange – are not significant reduced. These are results based on a 1M container Intermodal; while some trip generation efficiencies may be generated by a 1.7M Intermodal, it appears inevitable that a southern "release valve" will be required.

Based on these findings, it is fundamentally inappropriate to include an assessment of the Intermodal impacts in this TIA. Simply, the assessment detailed in **Appendix D.6** indicates the potential for the 1.7M Intermodal to generate hundreds of vehicle trips to Local Route, compared to the current SIMTA TIA estimate of 50vph to the Local Route. This range is simply too broad to assign with any confidence as part of this TIA.

6 Future Traffic Flows

6.1 Base 2024

The Base 2024 road network will include existing trips (**Section 2**); additional GRURA trips (**Appendix D.1**); additional trips at the intersection of Campbelltown Road & Glenfield Road (**Appendix D.2**); and average annual growth (**Appendix D.3**).

The resulting flows are shown in **Figure 6.1.1** (2024 AM) and **Figure 6.1.2** (2024 PM).

6.2 Base 2024 + Proposal

The forecast trip generation of the Proposal (**Section 4**) has been added to the Base 2024 network flows identified in **Section 6.1** above.

The resulting flows are shown in **Figure 6.2.1** (2024 AM) and **Figure 6.2.2** (2024 PM).

6.3 Base 2024 + Proposal + SSD Proposal

Given the concurrent SSD Proposal, an assessment of the combined projects is warranted. The forecast trip generation of the SSD Proposal (**Appendix D.5**) has therefore been added to the Base 2024 + Proposal network flows identified in **Section 6.2** above.

The resulting flows are shown in **Figure 6.3.1** (2024 AM) and **Figure 6.3.2** (2024 PM).

Figure 6.1.1 Base 2024 AM

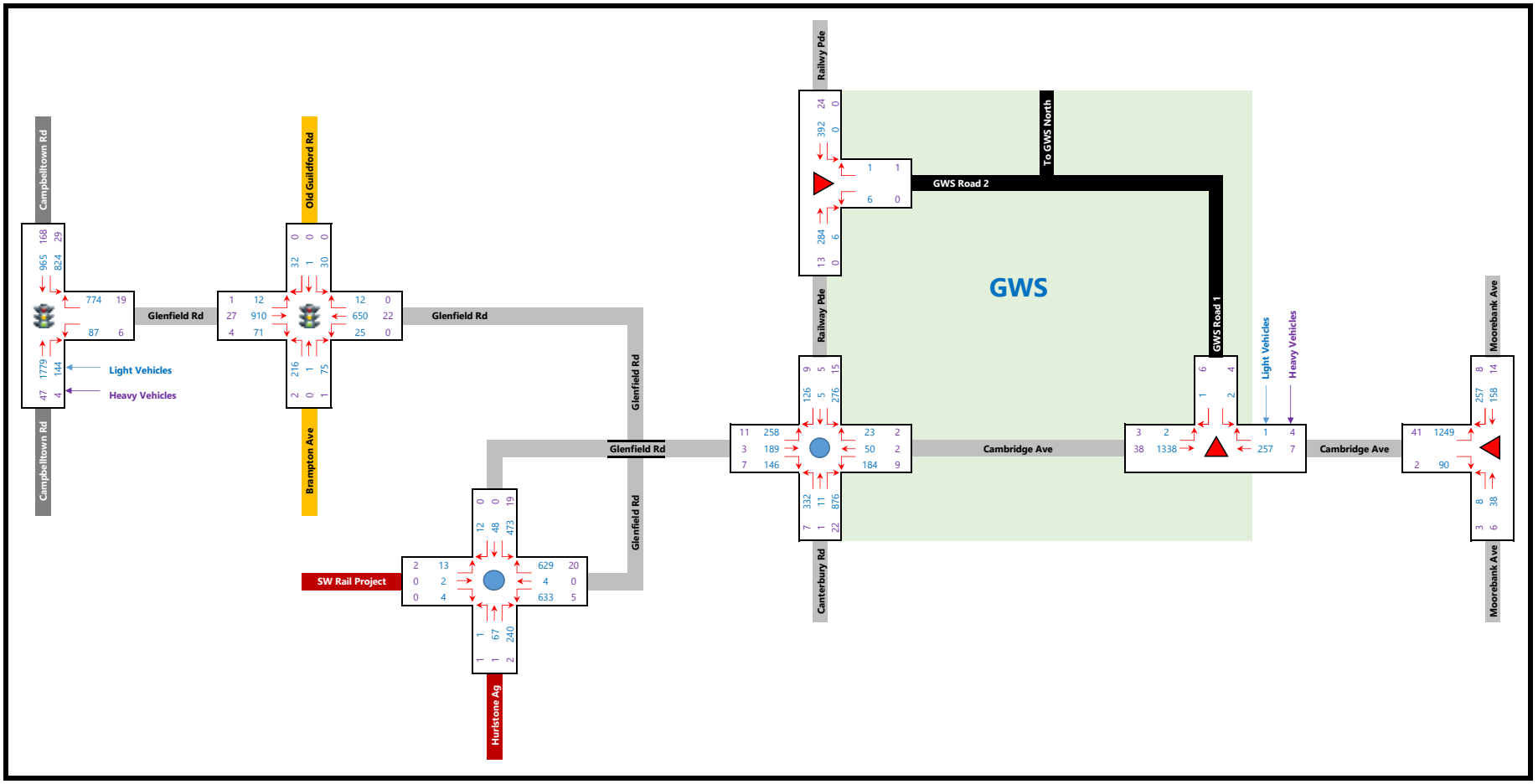


Figure 6.1.2 Base 2024 PM

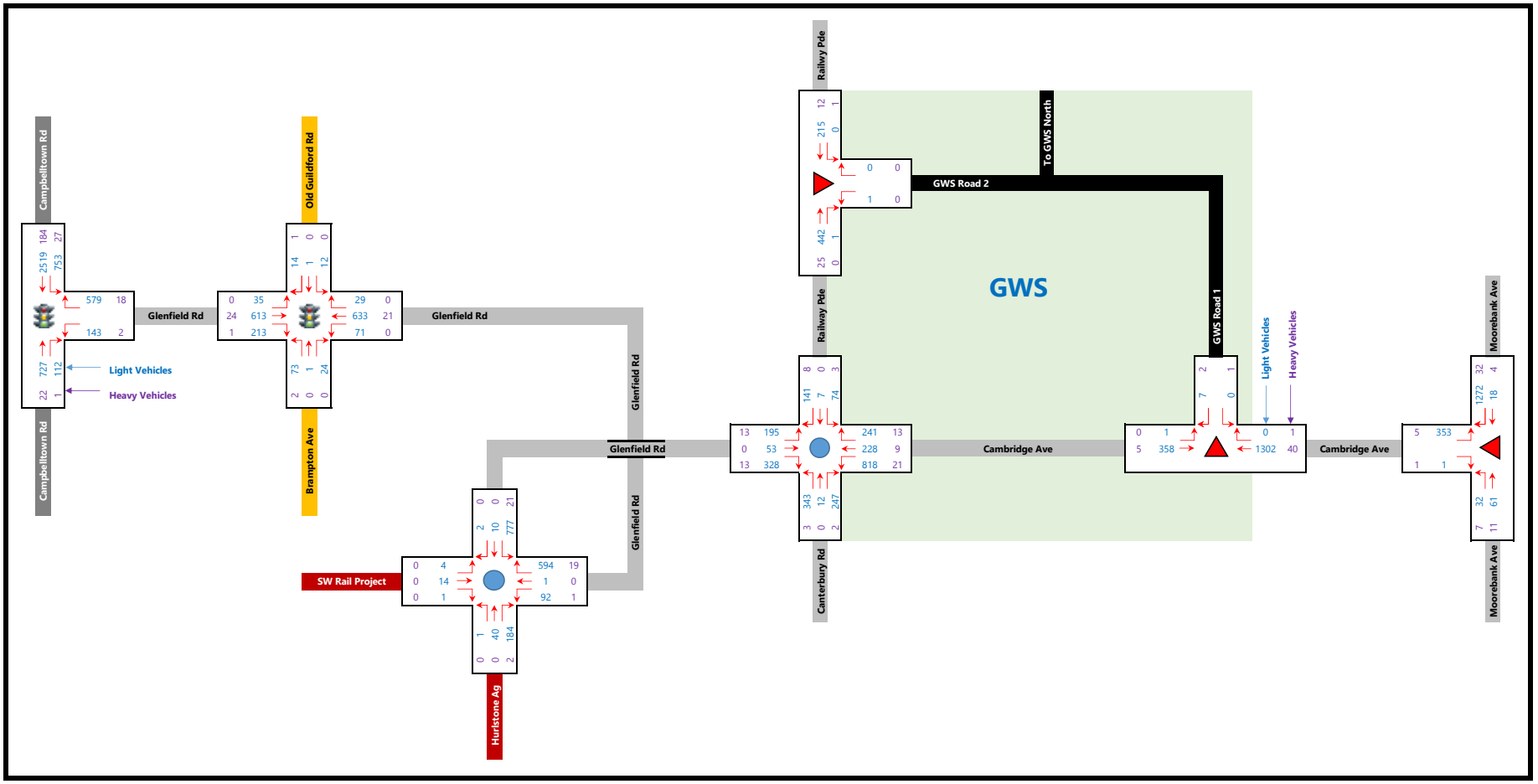


Figure 6.2.1 Base 2024 AM + Proposal

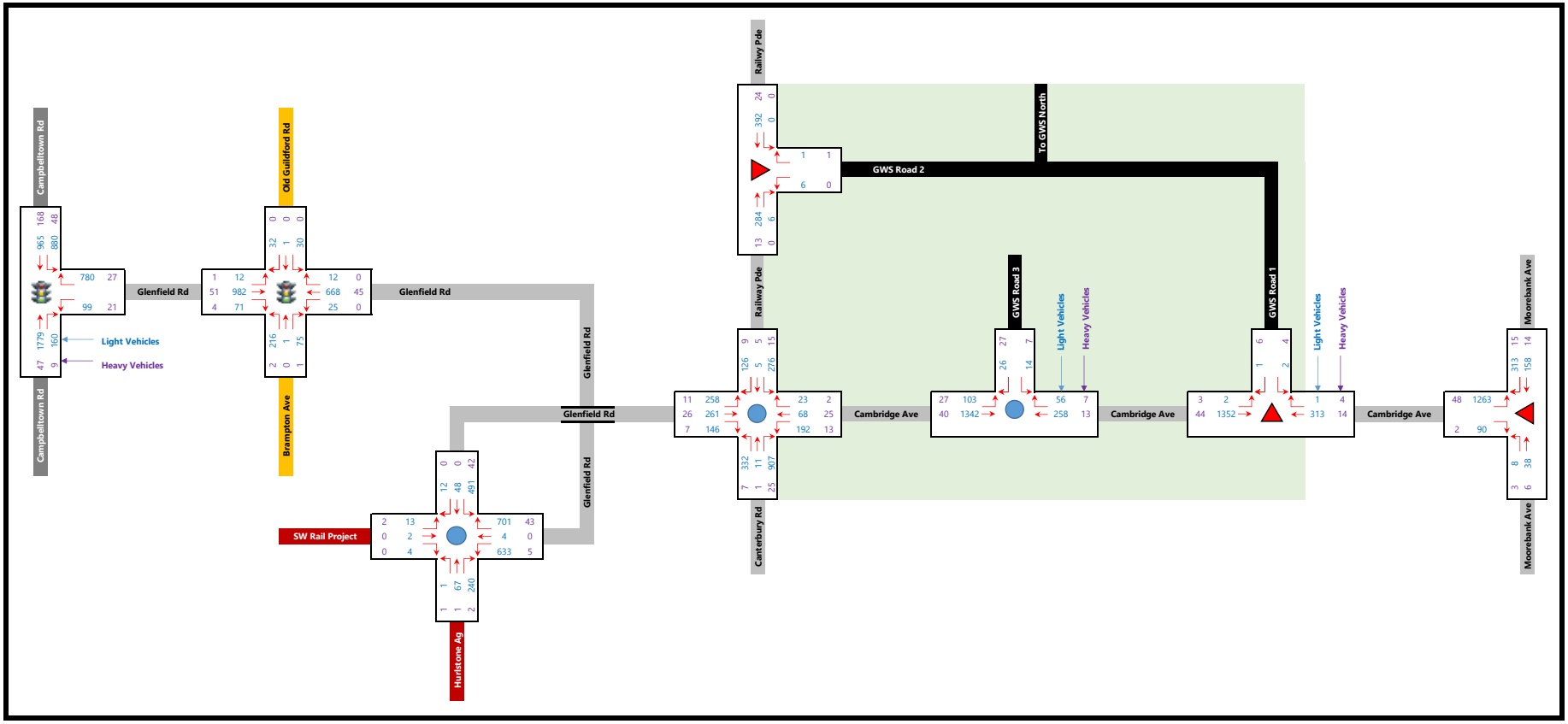


Figure 6.2.2 Base 2024 PM + Proposal

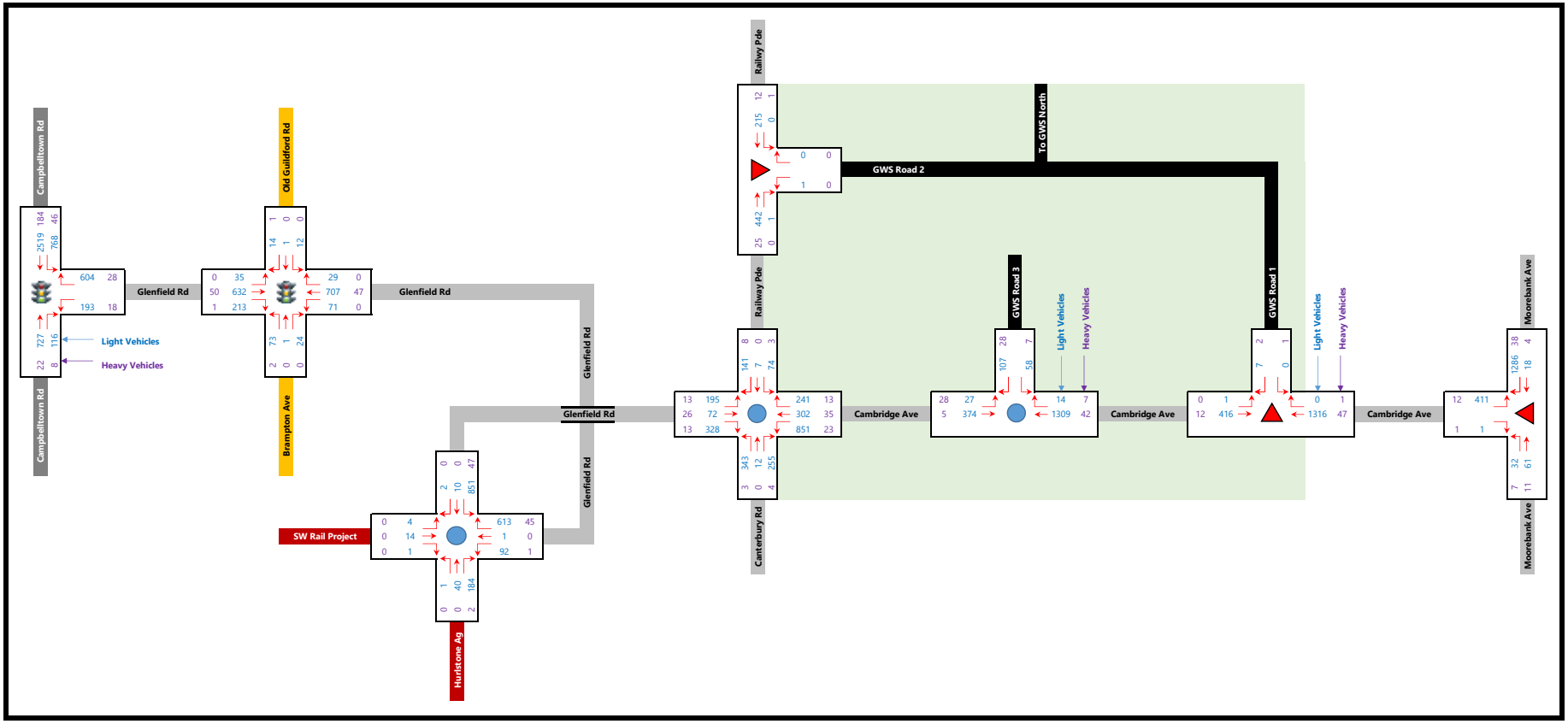


Figure 6.3.1 Base 2024 AM + Proposal + SSD Proposal

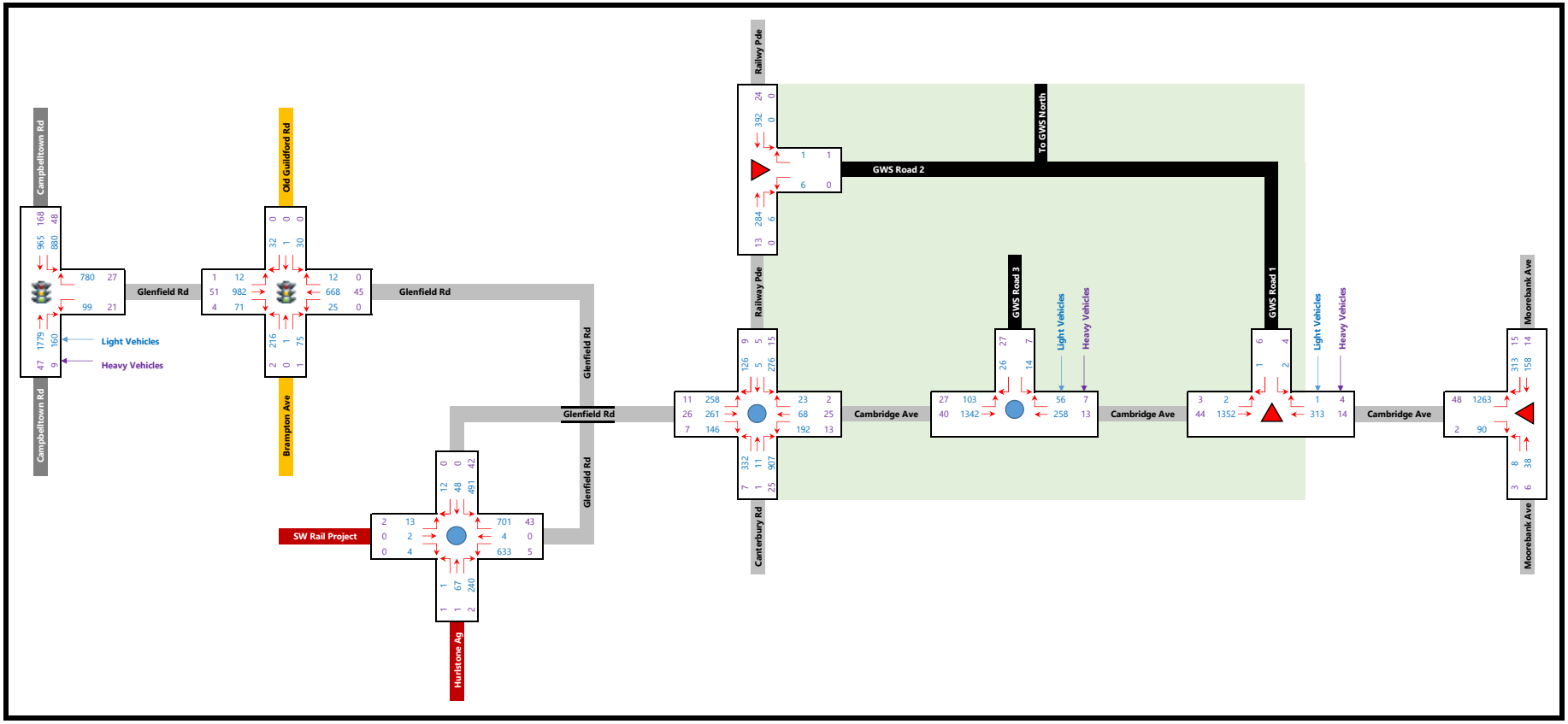
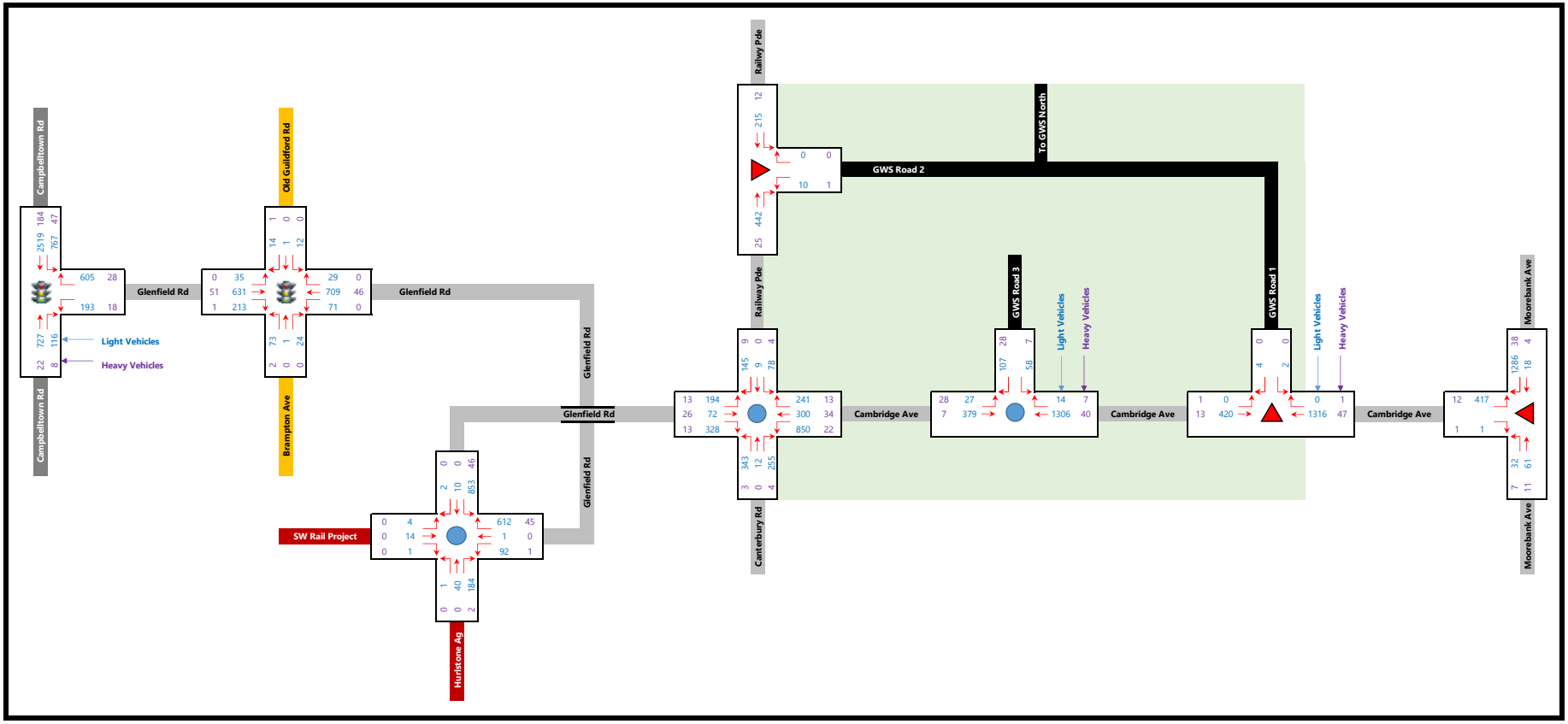


Figure 6.3.2 Base 2024 PM + Proposal + SSD Proposal



7 Future Network Performance

7.1 Intersection Upgrades

While the geometry of most intersections will remain unchanged through 2024, a number of changes/upgrades have been included in the SIDRA modelling of the 2024 forecast scenarios.

7.1.1 GWS Road 3 & Cambridge Avenue

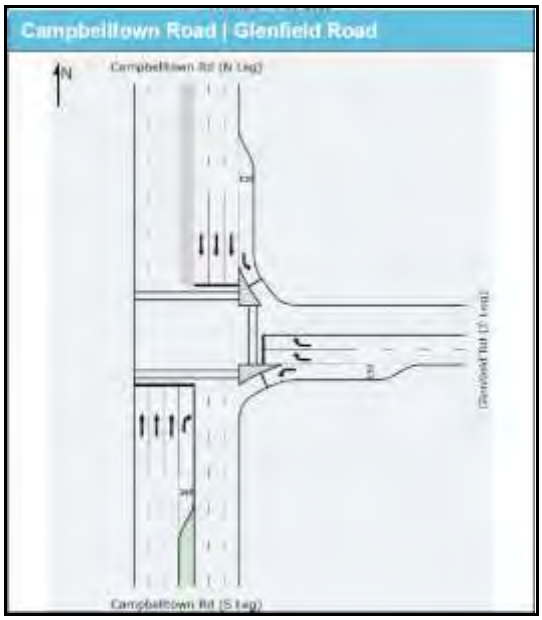
As discussed, at this time it is expected that a roundabout will be provided at the intersection of GWS Road 3 & Cambridge Avenue to appropriately provide for the trip demands of the Proposal. The assessment below is based on a standard two lane roundabout with dual approach lanes diverging from single lanes, and dual departure lanes merging to single lanes, in Cambridge Avenue.

It is noted that in the future it may be appropriate – and indeed necessary further to the construction of a bridge to replace the Causeway – to divert some access from the [future] GWS operations from GWS Road 1 GWS Road 3, specifically in regard to right turn movements (GWS Road 1 to Cambridge Avenue). The potential for such access will be further developed as part of future development assessments, necessarily accounting to progress [to that time] in regard to the planning for such a bridge.

7.1.2 Campbelltown Road & Glenfield Road

The CR TTMA provides the following [SIDRA] layout plan for the upgraded intersection of Campbelltown Road & Glenfield Road: -

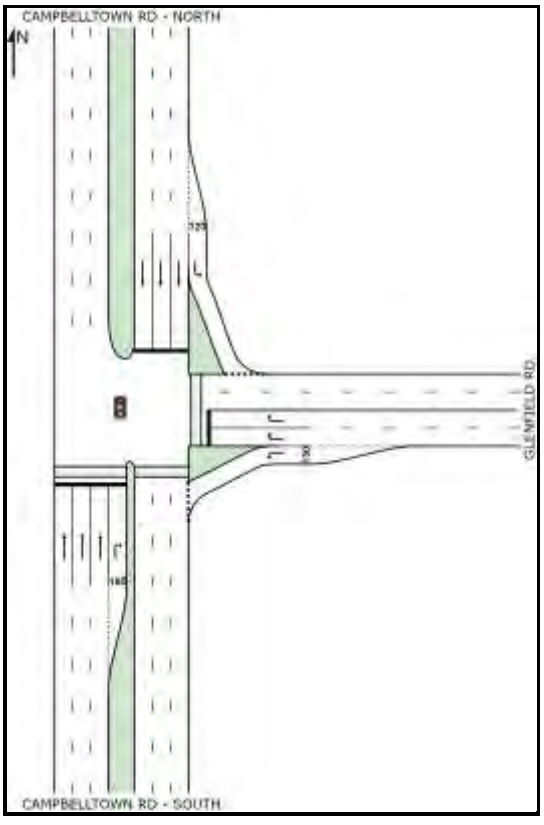
Figure 7.1.2.1 Campbelltown Road & Glenfield Road Upgrade Proposal



Source: CR TTMA

Further to our discussions with the RMS and Council, it is our understanding that the intersection will provide pedestrian crossings of the southern approach of Campbelltown Road, and across Glenfield Road, as per below: -

Figure 7.1.2.2 Campbelltown Road & Glenfield Road Upgrade Proposal



Some components of the Upgrade – the extended right turn and left turn bays from Campbelltown Road to Glenfield Road, and the extended left turn lane Glenfield Road to Campbelltown Road – will be determined in the final planning for the intersection. Less clear at this time is the [indicated] widening of Glenfield Road to provide 2 eastbound lanes and 2 westbound lanes (plus the left turn lane).

At present, one of the 2 right turn approach lanes to Glenfield Road is a "short lane" (as defined in SIDRA) with a length of approximately 90m, while the kerbside eastbound lane is also a short lane requiring a merge to the single eastbound through lane, approximately 100m from Campbelltown Road. The result of providing a short lane as opposed to a "full length" lane (again as defined in SIDRA) is that queues are not as likely to form or be as significant on an approach with 2 full length lanes, as they are when there is only one full length lane and 1 short lane. Once queues reach a certain length, this can also impact delay and capacity.

It is also the case that if these lanes extend east to the intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road, capacity at that intersection would also improve.

Further to our discussions with the RMS and Council suggesting an imminent upgrade further to the 'Pinch Point Program' funding, the SIDRA modelling of the 2024 forecast scenarios has included the proposed upgrades as per **Figure 7.1.2.2**.

7.1.3 GWS 2 & Railway Parade

The "upgrade" of this intersection – which is relevant only when testing the SSD Proposal - would provide for departure movements only from GWS Road 2 to Railway Parade, and as such there would be no turning movements from Railway Parade to GWS Road 2.

7.2 Future Intersection Operations

The operations of all key intersections under the different 2024 forecast scenarios outlined in **Section 6** have been assessed using SIDRA, with the results provided in the tables below.

Table 7.2.1 Base 2024 Intersection Operations

2024 Base Conditions	Level of Service		Average Deelay (s)		Worst Delay (s)		Degree of Saturation		Queue (m)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
GWS Road 1 & Cambridge Avenue	F [A]	D	1.1	0.4	135.0	49.1	0.72	0.70	7.8	2.8
GWS Road 2 & Railway Parade	A	A	0.6	0.5	7.1	6.4	0.13	0.21	6.5	9.5
Cambridge Avenue & Moorebank Avenue	A	F [A]	5.6	7.7	9.2	95.2	0.85	0.81	89.7	131.9
Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade	A	A	12.8	7.4	29.3	11.7	0.66	0.39	51.1	16.0
Glenfield Road & Hurlstone College & South West Rail Access	A	A	7.2	7.6	14.2	13.5	0.78	0.61	85.4	38.6
Glenfield Road & Brampton Avenue & Old Glenfield Road	B	B	24.9	25.3	33.1	30.0	0.77	0.61	159.6	114.6
Glenfield Road & Campbelltown Road	C	B	29.2	20.2	72.6	88.6	0.61	0.84	192.2	224.9

Table 7.2.2 Base 2024 + Proposal Intersection Operations

2024 + Proposal	Level of Service		Average Deelay (s)		Worst Delay (s)		Degree of Saturation		Queue (m)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
GWS Road 1 & Cambridge Avenue	F [A]	E	1.2	0.5	182.2	60.9	0.73	0.72	9.8	3.3
GWS Road 2 & Railway Parade	A	A	0.6	0.5	7.1	6.4	0.13	0.21	6.5	9.5
GWS Road 3 & Cambridge Avenue (roundabout)	A	A	3.9	4.1	7.4	10.4	0.50	0.50	28.0	27.7
Cambridge Avenue & Moorebank Avenue	A	F [A]	5.7	7.9	10.0	103.4	0.87	0.82	99.1	146.3
Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade	A	A	13.7	7.4	25.7	12.1	0.70	0.44	51.0	19.0
Glenfield Road & Hurlstone College & South West Rail Access	A	A	7.3	8.0	14.3	14.1	0.84	0.70	116.6	56.4
Glenfield Road & Brampton Avenue & Old Glenfield Road	B	B	24.2	24.7	34.0	30.8	0.84	0.67	177.2	136.8
Glenfield Road & Campbelltown Road	C	B	29.5	22.2	70.3	91.0	0.68	0.87	189.3	247.0

Table 7.2.3 Base 2024 + SSD Proposal Intersection Operations

2024 + SSD Proposal	Level of Service		Average Deelay (s)		Worst Delay (s)		Degree of Saturation		Queue (m)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
GWS Road 1 & Cambridge Avenue	F [A]	C	0.6	0.2	71.1	34.3	0.72	0.70	2.9	0.7
GWS Road 2 & Railway Parade	A	A	0.0	0.0	1.6	0.8	0.13	0.21	0.7	0.2
Cambridge Avenue & Moorebank Avenue	A	F [A]	5.6	7.7	9.3	94.7	0.85	0.81	91.1	130.9
Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade	A	A	13.6	7.4	33.6	11.8	0.67	0.39	58.6	15.9
Glenfield Road & Hurlstone College & South West Rail Access	A	A	7.2	7.5	14.3	13.5	0.78	0.61	86.9	38.5
Glenfield Road & Brampton Avenue & Old Glenfield Road	B	B	24.9	25.4	33.1	30.0	0.77	0.61	161.0	115.2
Glenfield Road & Campbelltown Road	C	B	29.2	20.2	72.6	88.6	0.62	0.84	192.2	224.9

Table 7.2.4 Base 2024 + Proposal + SSD Proposal Intersection Operations

2024 + Proposal + SSD Proposal	Level of Service		Average Deelay (s)		Worst Delay (s)		Degree of Saturation		Queue (m)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
GWS Road 1 & Cambridge Avenue	F [A]	C	0.7	0.3	86.1	40.6	0.74	0.72	3.1	0.9
GWS Road 2 & Railway Parade	A	A	0.0	0.0	1.6	0.8	0.13	0.21	0.7	0.2
GWS Road 3 & Cambridge Avenue (roundabout)	A	A	3.9	4.1	7.3	10.4	0.51	0.50	28.7	27.5
Cambridge Avenue & Moorebank Avenue	A	F [A]	5.7	7.9	10.1	103.4	0.88	0.82	100.1	146.3
Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade	A	A	14.1	7.5	27.6	12.1	0.71	0.44	52.7	18.7
Glenfield Road & Hurlstone College & South West Rail Access	A	A	7.3	8.0	14.3	14.1	0.84	0.70	118.5	56.5
Glenfield Road & Brampton Avenue & Old Glenfield Road	B	B	24.2	24.7	34.0	30.8	0.85	0.67	178.5	136.9
Glenfield Road & Campbelltown Road	C	B	29.5	22.3	70.3	91.0	0.69	0.87	189.3	247.0

7.3 Future Road Network Performance

7.3.1 Impacts of the Proposal - Intersections

With reference to the intersection performance results provided in **Table 7.2.1** and **Table 7.2.2** – and indeed further to the introduction of the SSD Proposal trips reported in **Table 7.2.4** - the Proposal will have little significant impact on the operation of the local road network, with all performance measures almost identical to those reported for Base 2024 conditions: -

- LoS is unchanged further to the Proposal at all but the intersection of GWS Road 1 & Cambridge Avenue, where LoS moves from LoS "D" to LoS "E" in the PM. However, with the addition of the SSD Proposal – and specifically the resulting redistribution of trips to GWS Road 2 – LoS improves to a LoS "C" in the PM.

- The high delays to the minor right turn movements at GWS Road 1 & Cambridge Avenue in the AM, and at Cambridge Avenue & Moorebank Avenue in the PM, remain, but as discussed in **Section 2.4** these delays apply to a small number of vehicles only and have no impact on general intersection performance with all other movements operating at a LoS "A". Further – and as discussed above – the redistribution of trips provided by the SSD Proposal results in a lower average delay for the right turn GWS Road 1 to Cambridge Avenue than is reported under Base 2024 conditions.

- At the intersection of Glenfield Road & Hurlstone Agricultural College, 95%ile queue lengths on the approach from Glenfield Road west increase by some 30m from Base 2024 conditions but average delays on this approach remain minimal. Sensitivity testing indicates that 95%ile queue lengths, average delays and capacity would all be improved further to the removal of the South West Rail Link access point to the roundabout.

  With reference to **Section 5.4** above, it is also the case that a new approach to the HAHS via Campbelltown Road at Beech Road would reduce flows using the Glenfield Road approach (and it is noted these flow reductions would likely extend back along Glenfield Road to Campbelltown Road).

- At the intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road, 95%ile queues increase by some 10m further to the Proposal, a minor increase proportional to Base 2024 queue lengths, while average delays and capacity are not significantly affected.

- The intersection of Campbelltown Road & Glenfield Road will accommodate significantly increased traffic flows by 2024. While the intersection will continue to operate at a good LoS (specifically further to the Upgrade) 95%ile queue lengths in Campbelltown Road and in Glenfield Road in both the AM and PM will still be significant. Notwithstanding, these 95%ile queues only increase by some 10m (in Glenfield Road) further to the Proposal, a minor increase proportional to Base 2024 queue lengths, while average delays and capacity are not significantly affected.

Further to discussions with the Upgrade Project Team, final planning for the upgrade of this intersection has not been completed, and further assessments will review the CR TTMA traffic flow forecasts, particularly given the significantly higher [than currently forecast] flows to/from Glenfield Road identified in this TIA. .

- More broadly across the day, traffic flows through the local road network reduce quickly and significantly outside of the AM and PM, such that flows generated by the Proposal "through the day" would oppose significantly lower flows at key intersections, and as such would similarly have only minor impact on intersection operations.

- Finally, reference to **Table 7.3.4** and **Table 7.4.4** indicates that the SSD Proposal trips have no significant impact on the local network, with virtually no changes to delays, 95%ile queue lengths or capacity further to the introduction of the SSD Proposal trips in addition to the Proposal trips.

In summary, ARC has concluded that the trip generation of the Proposal would have no significant impact on the operation of intersections through the local road network through 2024.

7.3.2 Impacts of the Proposal – The Causeway

ARC acknowledges the fact that the Proposal would generate additional heavy vehicle trips to the Causeway. As detailed in **Section 2.5**, were this section of Cambridge Avenue a standard width carriageway, this would not be an issue, but the narrow Causeway does inherently suggest less capacity and less than ideal safety conditions.

While acknowledging in earlier sections the Causeway may be operating at or over a theoretical capacity, it nonetheless remains the case that it does accommodate high flows principally as a result of the distance to, and capacity of, the booked intersections to the east and west; and the fact that the constraints of the Causeway are limited to a very short section of the otherwise well designed Cambridge Avenue.

The Proposal itself would generate a moderate number of trips to the Causeway during the peak periods, some 84vph in the AM (less than 5% of the two-way flow) and 86 trips in the PM (less than 5% of the two-way flow). The majority of these trips will also be generated to the non-tidal direction; in the AM, 63vph would be westbound (with the tidal flow eastbound) and in the PM, 65vph eastbound (with the tidal flow westbound).

ARC has concluded that the additional generation of the Proposal could not be considered as having a significant impact in and of itself on the capacity or general operations of the Causeway.

Finally, throughout the preparation of this TIA, ARC has discussed the operation of the Causeway at length with Council, Liverpool Council, the RMS and the Department of Planning, and while there is consensus that a new bridge is required – and moreover that that bridge should be tied into the Intermodal development – there remains no firm position on when such might be completed. What is certain is that the existing route via the Causeway remains a key sub-regional route, not only for commuters but also for sub-regional heavy vehicle movements, the redistribution of which to other routes could have significant impacts.

7.3.3 Impacts of the Proposal – Cambridge Avenue Travel Time

General trip times along Cambridge Avenue can be determined with reference to the average intersections delays at the existing (and potentially future) intersections along Cambridge Avenue, and with some general estimate in regard to potential vehicle speed reductions as a function of traffic volumes, though we note again that the current 85th percentile speed in Cambridge Avenue west of GWS Road 1 is some 71km/h westbound and 68km/h eastbound, i.e. the relatively heavy existing flows do not appear to be slowing anyone down.

SIDRA modelling of the intersection of Cambridge Avenue & Moorebank Avenue (see **Appendix B1**) shows very minor additional delays to vehicles travelling to and from Moorebank Avenue in the AM and PM further to the Proposal, but in all cases – for the left turn Cambridge Avenue to Moorebank Avenue, and the right turn Moorebank Avenue to Cambridge Avenue – those increases are less than 1 second per vehicle.

SIDRA modelling of the intersection of Cambridge Avenue & Canterbury Road & Railway Parade (see **Appendix B3**) shows minor additional delays to vehicles travelling to and from Cambridge Avenue from Canterbury Road and Glenfield Road in the AM and PM further to the Proposal, but in all cases – for the right turn Canterbury Road to Cambridge Avenue and vice versa, and the through movement Glenfield Road to Cambridge Avenue and vice versa - those increases are less than 1 second per vehicle.

SIDRA modelling of a future intersection of Cambridge Avenue & GWS Road 3 (see **Appendix B8**) shows what would be new through movement delays at a [roundabout] intersection of Cambridge Avenue & GWS Road 3 of less than 5 seconds per vehicle in the AM and PM.

In total therefore, the Proposal would add less than 10 seconds of average delay time to a journey along Cambridge Avenue between Canterbury Road/Glenfield Road and Moorebank Avenue; ARC is of the opinion that such a delay could not be considered to be significant.

7.3.4 Impacts of the Proposal – Road Pavement Conditions

It is acknowledged that the Proposal would result in additional impacts on the local road pavement; means of ameliorating such in consultation with CC Council will necessarily be required at a future date. ARC notes that any potential contributions would need to be calculated on a proportional basis (i.e. what proportion of general and heavy vehicles are generated by the Proposal at key locations) and also necessarily include any other potential generators such as the Intermodal; it is in our opinion essential that any such proportionate funding be based on a realistic future distribution of Intermodal trips to the southern route.

8 Conclusions

ARC has prepared a detailed and independent assessment of the Proposal, specifically focusing on the potential of trips generated by the Proposal to impact the local road network. The assessment has included a detailed analysis of the trip generation and distribution characteristics of the Proposal, as well as detailed analysis of potential sub-regional trip generating projects so as provide an appropriate assignment of Proposal trips to the local road network for a forecast year 2024.

8.1 Traffic Impacts

With reference to SIDRA intersection analysis, and a review of AustRoads, RMS and other design guidelines, ARC has concluded that the Proposal would have no significant impact on the local road network through 2024. In summary: -

- No delay increases such as would significantly reduce Level of Service (**LoS**) are reported in 2024 further to the introduction of the Proposal, nor are there reports of any significant capacity reductions or 95%ile queue length increases attributable to the additional Proposal trips.

- The intersection of GWS Road 1 & Cambridge Avenue will continue to report a poor LoS in both the AM and PM through 2024, being entirely attributable to the right turn GWS Road 1 to Cambridge Avenue. Further to an approval of the SSD Proposal (as well as the Proposal), these delays would be reduced as the majority of the right turn demand to Cambridge Avenue would be redistributed to GWS Road 2.

- The intersection of Cambridge Avenue & Moorebank Avenue reports a similarly poor LoS in the PM to the intersection of Cambridge Avenue & GWS Road 1, but this delay also relates to a very small number of vehicles turning right from Cambridge Avenue to Moorebank Avenue and has no impact on the broader operation of the intersection. The Proposal itself has no significant impact on delays, capacity or 95%ile queues at this intersection.

- The roundabout of Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade will continue to operate at a good LoS through 2024 in the AM and PM, with the Proposal having no significant impact on delays, capacity or 95%ile queues at this intersection.

- The roundabout of Glenfield Road & Hurlstone Agricultural College & [for the short term] a South West Railway Construction Access operates at a good LoS in the AM and PM through 2024, though the single lane capacity is reduced and 95%ile queue lengths increased, but in and of itself the Proposal has no significant impact on delays, capacity or 95%ile queues at this intersection.

- The signalised intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road will continue to operate at a good LoS with moderate delays, though 95%ile queue lengths will be increased, but the Proposal in and of itself has no significant impact on delays, capacity or 95%ile queues at this intersection.

- The intersection of Campbelltown Road & Glenfield Road will accommodate significantly increased traffic flows by 2024. While the intersection will continue to operate at a good LoS (specifically further to the Upgrade) 95%ile queue lengths in Campbelltown Road and Glenfield Road in both the AM and PM will likely still be significant, but the Proposal in and of itself has no significant impact on delays, capacity or 95%ile queues at this intersection.

- The Causeway is estimated to accommodate some 1,800vph in the AM and PM by 2024. While this flow is within the theoretical capacity of a two lane road, consideration of the width of the Causeway, directional splits and the lack of an adjacent verge suggests a much lower capacity; conversely, the Causeway represents only a very small section of Cambridge Avenue which more generally provides the characteristics suitable to accommodate higher flows. As importantly, there is significant separation between the Causeway and the 'bookend' intersections to the east and west.

  While there is growing pressure to replace the Causeway (with a high level bridge) to ameliorate both traffic and [perhaps more importantly] flooding issues, the trips generated by the Proposal would in and of themselves have no significant impact on the operation of the Causeway.

- Finally, the addition of the SSD Proposal trip generation has no impact on these findings, primarily as a result of the very low generation of the SSD Proposal. As such, the Proposal and SSD Proposal could both be accommodated by the local road network through 2024.

8.2 Sub-Regional Issues

While the local road network will operate at a generally good LoS through 2024, it is nonetheless the case that upgrade requirements are already being considered. The provision of a [four lane] bridge to replace the Causeway remains a subject of much debate, with the greatest potential for implementation linked very specifically to the Intermodal; however, with the SIMTA TIA reporting only a very minor Intermodal generation via Cambridge Avenue, this link is somewhat tenuous.

The assessment of the Intermodal provided in this TIA suggests the potential for significant Intermodal trip generation through the local road network, particularly for trips to/from Campbelltown Road; and trips to the Hume Motorway via the Campbelltown Road on-ramp. If such potential is realised, it may be that the bridge [and potentially the proposed Link Road to Campbelltown Road] will be required; this would certainly take pressure off Moorebank Avenue and the M5 Interchange, at which all but unacceptable delays are reported in the available Intermodal documents, even further to the SIMTA TIA recommended upgrade works.

Given that the SIMTA TIA considers only a 1M Intermodal rather than the capacity 1.7M Intermodal – a viable southern route appears essential to the sustainability of the broader sub-regional (and indeed regional) road network.

8.3 Conclusion

Notwithstanding the broader sub-regional trip generation and infrastructure issues outlined above, **it is the conclusion of ARC that the Proposal is supportable, primarily as a result of a moderate trip generation during the peak periods – simply, the existing and future local road network can accommodate the Proposal with minimal resulting impacts.**

Further to a rezoning, detailed Traffic Impact Assessments will necessarily be prepared to support future Development Applications for the Site. These assessments will be required to assess and review traffic and transport conditions at the time of the applications; as detailed in this TIA, it is the case that there is potential for the local road network to change in even the short term, and any such changes will require assessment prior to Site development.

Nonetheless – and specifically further to the detailed consideration of local and sub-regional traffic issues – ARC has determined that there are no identifiable impediments to the rezoning of the southern portion of the Site for industrial development.

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix A Traffic Survey Data

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ACN: 150 259 493

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Table 1.4 Intersection Railway Parade & GWS Road 2

Table 1.5 Intersection Glenfield Road & Hurlstone Agricultural College

Table 1.6 Intersection Glenfield Road & Brampton Avenue & Old Guildford Road

Table 1.7 Intersection Campbelltown Road & Glenfield Road

2 Cambridge Avenue Automatic Traffic Counter

Table 2.1 Average Daily Traffic (Two-Way)

Table 2.2 Average Daily Traffic (Eastbound)

Table 2.3 Average Daily Traffic (Westbound)

Table 2.4 Vehicle Class Summary

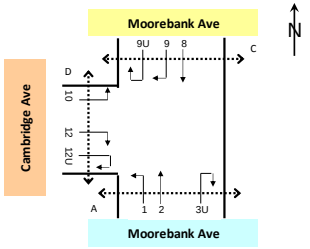
Table 2.5 Skyhigh Traffic Vehicle Classification Scheme

All traffic surveys conducted and reported by Skyhigh Traffic.

Table 1.1 Cambridge Avenue & Moorebank Avenue

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Cambridge Ave/Moorebank Ave

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Moorebank Ave											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	8	3	0	**11**	36	5	1	**42**	0	0	0	**0**
7:15 to 8:15	10	4	0	**14**	53	4	1	**58**	0	0	0	**0**
7:30 to 8:30	11	6	0	**17**	68	3	0	**71**	0	0	0	**0**
7:45 to 8:45	11	5	0	**16**	76	5	0	**81**	0	0	0	**0**
8:00 to 9:00	10	5	1	**16**	79	6	0	**85**	0	0	0	**0**
AM Totals	**18**	**8**	**1**	**27**	**115**	**11**	**1**	**127**	**0**	**0**	**0**	**0**
16:00 to 17:00	30	7	0	**37**	58	10	0	**68**	0	0	0	**0**
16:15 to 17:15	43	14	0	**57**	52	6	0	**58**	0	0	0	**0**
16:30 to 17:30	43	16	0	**59**	36	4	0	**40**	0	0	0	**0**
16:45 to 17:45	53	15	0	**68**	35	4	0	**39**	0	0	0	**0**
17:00 to 18:00	63	14	0	**77**	34	1	0	**35**	0	0	0	**0**
PM Totals	**93**	**21**	**0**	**114**	**92**	**11**	**0**	**103**	**0**	**0**	**0**	**0**

Approach	Moorebank Ave												Cambridge Ave							
Direction	Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	150	9	4	**163**	238	8	0	**246**	0	0	0	**0**	1,135	39	0	**1,174**	86	2	0	**88**	0	0	0	**0**
7:15 to 8:15	107	4	4	**115**	264	11	0	**275**	0	0	0	**0**	1,113	36	0	**1,149**	63	2	0	**65**	0	0	0	**0**
7:30 to 8:30	85	3	1	**89**	289	17	0	**306**	0	0	0	**0**	1,056	29	1	**1,086**	38	2	0	**40**	0	0	0	**0**
7:45 to 8:45	86	3	0	**89**	293	19	3	**315**	0	0	0	**0**	983	25	2	**1,010**	34	3	0	**37**	0	0	0	**0**
8:00 to 9:00	88	5	0	**93**	280	16	6	**302**	0	0	0	**0**	847	25	2	**874**	33	2	0	**35**	0	0	0	**0**
AM Totals	**238**	**14**	**4**	**256**	**518**	**24**	**6**	**548**	**0**	**0**	**0**	**0**	**1,982**	**64**	**2**	**2,048**	**119**	**4**	**0**	**123**	**0**	**0**	**0**	**0**
16:00 to 17:00	17	4	0	**21**	1,125	30	0	**1,155**	0	0	0	**0**	331	4	1	**336**	1	1	0	**2**	0	0	0	**0**
16:15 to 17:15	14	4	0	**18**	1,143	28	0	**1,171**	0	0	0	**0**	330	3	1	**334**	2	1	0	**3**	0	0	0	**0**
16:30 to 17:30	12	1	0	**13**	1,191	22	0	**1,213**	0	0	0	**0**	326	4	1	**331**	5	1	0	**6**	0	0	0	**0**
16:45 to 17:45	12	1	0	**13**	1,209	25	0	**1,234**	0	0	0	**0**	328	4	1	**333**	8	1	0	**9**	0	0	0	**0**
17:00 to 18:00	14	1	0	**15**	1,193	26	0	**1,219**	0	0	0	**0**	326	3	1	**330**	10	0	0	**10**	0	0	0	**0**
PM Totals	**31**	**5**	**0**	**36**	**2,318**	**56**	**0**	**2,374**	**0**	**0**	**0**	**0**	**657**	**7**	**2**	**666**	**11**	**1**	**0**	**12**	**0**	**0**	**0**	**0**

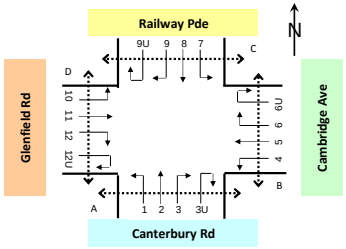
Table 1.2 Cambridge Avenue & GWS Road 1

Approach			Cambridge Avenue Westbound								GWS Road 1								Cambridge Avenue Eastbound							
Direction			Through				Right Turn				Left Turn				Right Turn				Left Turn				Through			
Time Period			Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
6:00	to	6:15	26	0	0	**26**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	273	12	0	**285**
6:15	to	6:30	43	2	0	**45**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	294	14	0	**308**
6:30	to	6:45	51	2	0	**53**	1	2	0	**3**	0	1	0	**1**	0	0	0	**0**	0	1	0	**1**	336	14	0	**350**
6:45	to	7:00	56	2	0	**58**	2	0	0	**2**	0	3	0	**3**	0	0	0	**0**	0	1	0	**1**	282	14	0	**296**
7:00	to	7:15	41	3	0	**44**	1	2	0	**3**	1	1	0	**2**	1	0	0	**1**	1	0	0	**1**	316	10	0	**326**
7:15	to	7:30	51	1	0	**52**	0	1	0	**1**	1	1	0	**2**	0	1	0	**1**	0	1	0	**1**	353	3	0	**356**
7:30	to	7:45	59	1	0	**60**	0	1	0	**1**	0	1	0	**1**	0	2	0	**2**	0	2	0	**2**	280	1	0	**281**
7:45	to	8:00	72	1	1	**74**	0	0	0	**0**	0	1	0	**1**	0	3	0	**3**	1	0	0	**1**	281	8	0	**289**
8:00	to	8:15	84	2	0	**86**	0	1	0	**1**	0	1	0	**1**	1	0	0	**1**	0	2	0	**2**	264	8	0	**272**
8:15	to	8:30	87	3	0	**90**	1	0	0	**1**	0	0	0	**0**	0	2	0	**2**	0	1	0	**1**	267	13	2	**282**
8:30	to	8:45	99	2	0	**101**	0	2	0	**2**	0	1	0	**1**	1	1	0	**2**	1	0	0	**1**	244	6	0	**250**
8:45	to	9:00	83	2	0	**85**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	4	0	**4**	162	5	0	**167**
9:00	to	9:15	70	1	0	**71**	2	0	0	**2**	0	2	0	**2**	0	2	0	**2**	1	0	0	**1**	148	2	2	**152**
9:15	to	9:30	46	1	0	**47**	0	0	0	**0**	0	1	0	**1**	2	0	0	**2**	1	0	0	**1**	139	2	1	**142**
9:30	to	9:45	55	0	1	**56**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	106	1	0	**107**
9:45	to	10:00	50	4	0	**54**	0	2	0	**2**	0	0	0	**0**	0	0	0	**0**	1	2	0	**3**	91	4	0	**95**
10:00	to	10:15	44	4	0	**48**	0	3	0	**3**	0	1	0	**1**	1	2	0	**3**	1	3	0	**4**	85	6	0	**91**
10:15	to	10:30	48	5	0	**53**	1	0	0	**1**	0	2	0	**2**	2	3	0	**5**	1	0	0	**1**	74	4	0	**78**
10:30	to	10:45	66	1	0	**67**	0	0	0	**0**	0	1	0	**1**	2	1	0	**3**	0	1	0	**1**	75	2	0	**77**
10:45	to	11:00	56	2	0	**58**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	0	3	0	**3**	78	2	0	**80**
11:00	to	11:15	41	2	1	**44**	0	3	0	**3**	0	0	0	**0**	0	1	0	**1**	2	2	0	**4**	72	1	0	**73**
11:15	to	11:30	52	1	0	**53**	1	1	0	**2**	0	2	0	**2**	2	5	0	**7**	1	0	0	**1**	72	3	0	**75**
11:30	to	11:45	46	5	0	**51**	0	0	0	**0**	0	2	0	**2**	1	1	0	**2**	0	3	0	**3**	64	1	1	**66**
11:45	to	12:00	53	0	0	**53**	0	2	0	**2**	0	2	0	**2**	0	1	0	**1**	0	2	0	**2**	72	3	1	**76**
12:00	to	12:15	58	1	0	**59**	0	1	0	**1**	0	3	0	**3**	1	0	0	**1**	1	0	0	**1**	69	0	1	**70**
12:15	to	12:30	76	4	0	**80**	1	0	0	**1**	0	1	0	**1**	0	1	0	**1**	1	1	0	**2**	97	2	0	**99**
12:30	to	12:45	69	3	0	**72**	0	0	0	**0**	1	0	0	**1**	4	0	0	**4**	3	0	0	**3**	65	0	1	**66**
12:45	to	13:00	68	2	0	**70**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	1	1	0	**2**	83	1	0	**84**
13:00	to	13:15	80	5	0	**85**	0	3	0	**3**	0	0	0	**0**	3	2	0	**5**	0	0	0	**0**	74	1	0	**75**
13:15	to	13:30	81	0	0	**81**	0	2	0	**2**	0	4	0	**4**	0	0	0	**0**	1	1	0	**2**	66	0	1	**67**
13:30	to	13:45	92	3	0	**95**	1	0	0	**1**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	83	1	0	**84**
13:45	to	14:00	90	2	0	**92**	0	1	0	**1**	0	0	0	**0**	1	0	0	**1**	1	2	0	**3**	94	2	1	**97**
14:00	to	14:15	95	2	1	**98**	1	1	0	**2**	0	1	0	**1**	1	1	0	**2**	1	0	0	**1**	90	1	0	**91**
14:15	to	14:30	121	6	0	**127**	1	1	0	**2**	1	0	0	**1**	2	1	0	**3**	1	0	0	**1**	78	1	0	**79**
14:30	to	14:45	137	2	0	**139**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	1	3	0	**4**	106	1	1	**108**
14:45	to	15:00	152	3	2	**157**	0	0	0	**0**	1	1	0	**2**	2	1	0	**3**	0	0	0	**0**	92	0	0	**92**
15:00	to	15:15	178	4	0	**182**	0	2	0	**2**	0	0	0	**0**	0	2	0	**2**	0	1	0	**1**	93	1	0	**94**
15:15	to	15:30	214	3	0	**217**	1	2	0	**3**	0	1	0	**1**	1	1	0	**2**	1	1	0	**2**	128	3	1	**132**
15:30	to	15:45	255	5	0	**260**	1	0	0	**1**	1	1	0	**2**	2	2	0	**4**	0	0	0	**0**	109	1	0	**110**
15:45	to	16:00	229	1	0	**230**	0	0	0	**0**	1	0	0	**1**	0	4	0	**4**	1	0	0	**1**	88	0	0	**88**
16:00	to	16:15	292	5	0	**297**	0	1	0	**1**	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	87	2	0	**89**
16:15	to	16:30	305	9	1	**315**	0	0	0	**0**	0	1	0	**1**	5	1	0	**6**	0	0	0	**0**	83	1	0	**84**
16:30	to	16:45	305	4	0	**309**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	86	0	0	**86**
16:45	to	17:00	287	9	0	**296**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	79	2	0	**81**
17:00	to	17:15	306	7	0	**313**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	85	1	0	**86**
17:15	to	17:30	301	1	0	**302**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	89	0	0	**89**
17:30	to	17:45	288	8	0	**296**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	72	0	0	**72**
17:45	to	18:00	267	4	0	**271**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	60	1	0	**61**
12hr Totals			**5,725**	**140**	**7**	**5,872**	**15**	**36**	**0**	**51**	**8**	**37**	**0**	**45**	**39**	**43**	**0**	**82**	**32**	**38**	**0**	**70**	**6,484**	**161**	**13**	**6,658**

Table 1.3 Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Glenfield Rd/Railway Pde/Canterbury Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



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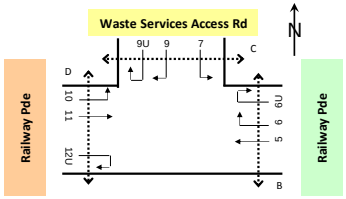
Approach	Canterbury Rd																Cambridge Ave															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	273	4	3	**280**	10	1	0	**11**	833	19	0	**852**	0	0	0	**0**	175	7	0	**182**	41	1	0	**42**	22	1	0	**23**	0	0	0	**0**
7:15 to 8:15	266	1	4	**271**	10	1	0	**11**	798	20	0	**818**	0	0	0	**0**	185	9	0	**194**	51	2	0	**53**	22	1	0	**23**	0	0	0	**0**
7:30 to 8:30	265	5	1	**271**	10	1	0	**11**	739	19	0	**758**	1	0	0	**1**	204	11	0	**215**	54	2	0	**56**	30	1	0	**31**	0	0	0	**0**
7:45 to 8:45	272	5	2	**279**	10	0	0	**10**	678	19	0	**697**	1	0	0	**1**	205	13	0	**218**	58	2	0	**60**	39	2	2	**43**	0	0	0	**0**
8:00 to 9:00	257	9	2	**268**	10	0	0	**10**	579	18	0	**597**	1	0	0	**1**	191	12	1	**204**	51	2	0	**53**	43	2	5	**50**	0	0	0	**0**
AM Totals	**530**	**13**	**5**	**548**	**20**	**1**	**0**	**21**	**1,412**	**37**	**0**	**1,449**	**1**	**0**	**0**	**1**	**366**	**19**	**1**	**386**	**92**	**3**	**0**	**95**	**65**	**3**	**5**	**73**	**0**	**0**	**0**	**0**
16:00 to 17:00	199	3	0	**202**	11	0	0	**11**	235	1	1	**237**	0	0	0	**0**	778	20	0	**798**	132	9	0	**141**	229	12	0	**241**	0	0	0	**0**
16:15 to 17:15	191	4	0	**195**	14	0	0	**14**	235	1	1	**237**	0	0	0	**0**	804	19	0	**823**	137	18	0	**155**	242	11	0	**253**	0	0	0	**0**
16:30 to 17:30	185	3	0	**188**	13	0	0	**13**	230	3	1	**234**	0	0	0	**0**	829	14	0	**843**	135	23	0	**158**	260	7	0	**267**	0	0	0	**0**
16:45 to 17:45	180	4	0	**184**	10	0	0	**10**	236	3	0	**239**	1	0	0	**1**	845	16	0	**861**	139	22	0	**161**	254	8	0	**262**	0	0	0	**0**
17:00 to 18:00	189	2	0	**191**	6	0	0	**6**	228	3	0	**231**	1	0	0	**1**	856	21	0	**877**	148	18	0	**166**	244	5	0	**249**	0	0	0	**0**
PM Totals	**388**	**5**	**0**	**393**	**17**	**0**	**0**	**17**	**463**	**4**	**1**	**468**	**1**	**0**	**0**	**1**	**1,634**	**41**	**0**	**1,675**	**280**	**27**	**0**	**307**	**473**	**17**	**0**	**490**	**0**	**0**	**0**	**0**

Approach	Railway Pde																Glenfield Rd															
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	263	14	0	**277**	5	0	0	**5**	104	3	6	**113**	0	0	0	**0**	173	3	7	**183**	127	3	0	**130**	98	6	1	**105**	0	0	0	**0**
7:15 to 8:15	239	15	0	**254**	4	0	0	**4**	111	3	5	**119**	0	0	0	**0**	207	4	7	**218**	110	2	0	**112**	126	7	1	**134**	0	0	0	**0**
7:30 to 8:30	230	9	0	**239**	4	0	0	**4**	119	3	4	**126**	0	0	0	**0**	211	3	7	**221**	99	1	1	**101**	158	6	1	**165**	0	0	0	**0**
7:45 to 8:45	210	5	0	**215**	0	0	0	**0**	111	2	5	**118**	0	0	0	**0**	204	2	5	**211**	102	2	2	**106**	192	5	1	**198**	0	0	0	**0**
8:00 to 9:00	177	3	0	**180**	0	1	0	**1**	101	3	3	**107**	0	0	0	**0**	174	1	5	**180**	95	1	2	**98**	212	6	0	**218**	0	0	0	**0**
AM Totals	**440**	**17**	**0**	**457**	**5**	**1**	**0**	**6**	**205**	**6**	**9**	**220**	**0**	**0**	**0**	**0**	**347**	**4**	**12**	**363**	**222**	**4**	**2**	**228**	**310**	**12**	**1**	**323**	**0**	**0**	**0**	**0**
16:00 to 17:00	70	3	0	**73**	7	0	0	**7**	82	1	7	**90**	1	0	0	**1**	168	5	7	**180**	46	0	0	**46**	282	9	3	**294**	1	0	0	**1**
16:15 to 17:15	65	3	0	**68**	7	0	0	**7**	91	1	7	**99**	1	0	0	**1**	182	6	6	**194**	46	0	0	**46**	288	10	4	**302**	1	0	0	**1**
16:30 to 17:30	63	3	0	**66**	6	0	0	**6**	101	3	9	**113**	1	0	0	**1**	185	3	7	**195**	51	0	0	**51**	263	7	4	**274**	0	0	0	**0**
16:45 to 17:45	63	1	0	**64**	4	0	0	**4**	115	3	9	**127**	0	0	0	**0**	184	1	9	**194**	49	0	0	**49**	275	6	2	**283**	0	0	0	**0**
17:00 to 18:00	65	0	0	**65**	1	0	0	**1**	118	2	9	**129**	0	0	0	**0**	174	1	6	**181**	51	0	0	**51**	266	3	2	**271**	0	0	0	**0**
PM Totals	**135**	**3**	**0**	**138**	**8**	**0**	**0**	**8**	**200**	**3**	**16**	**219**	**1**	**0**	**0**	**1**	**342**	**6**	**13**	**361**	**97**	**0**	**0**	**97**	**548**	**12**	**5**	**565**	**1**	**0**	**0**	**1**

Table 1.4 Railway Parade & GWS 2

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Railway Pde/Waste Services Access Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



SKYHIGH - THE TRAFFIC SURVEY COMPANY

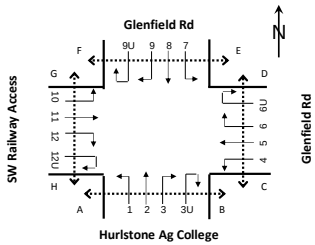
Approach	Railway Pde											
Direction	Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	198	5	7	**210**	6	0	0	**6**	0	0	0	**0**
7:15 to 8:15	238	7	7	**252**	7	1	0	**8**	0	0	0	**0**
7:30 to 8:30	236	5	6	**247**	9	1	0	**10**	0	0	0	**0**
7:45 to 8:45	245	4	7	**256**	8	1	0	**9**	0	0	0	**0**
8:00 to 9:00	223	4	11	**238**	8	1	0	**9**	0	0	0	**0**
AM Totals	**421**	**9**	**18**	**448**	**14**	**1**	**0**	**15**	**0**	**0**	**0**	**0**
16:00 to 17:00	403	17	7	**427**	0	0	0	**0**	1	0	0	**1**
16:15 to 17:15	421	16	6	**443**	0	0	0	**0**	1	0	0	**1**
16:30 to 17:30	442	9	7	**458**	0	0	0	**0**	1	0	0	**1**
16:45 to 17:45	427	8	9	**444**	0	0	0	**0**	1	0	0	**1**
17:00 to 18:00	410	5	6	**421**	0	0	0	**0**	0	0	0	**0**
PM Totals	**813**	**22**	**13**	**848**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**

Approach	Glenfield Waste Services Road 2												Railway Pde											
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	6	0	0	**6**	1	1	0	**2**	0	0	0	**0**	0	0	0	**0**	357	17	6	**380**	0	0	0	**0**
7:15 to 8:15	5	1	0	**6**	1	1	0	**2**	0	0	0	**0**	1	0	0	**1**	341	19	6	**366**	2	0	0	**2**
7:30 to 8:30	6	1	0	**7**	1	1	0	**2**	0	0	0	**0**	1	0	0	**1**	337	13	6	**356**	2	0	0	**2**
7:45 to 8:45	4	1	0	**5**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	309	8	6	**323**	2	0	0	**2**
8:00 to 9:00	3	1	0	**4**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	270	7	5	**282**	2	0	0	**2**
AM Totals	**9**	**1**	**0**	**10**	**1**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**627**	**24**	**11**	**662**	**2**	**0**	**0**	**2**
16:00 to 17:00	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	152	4	7	**163**	0	0	0	**0**
16:15 to 17:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	152	4	7	**163**	0	0	0	**0**
16:30 to 17:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	161	6	9	**176**	0	0	0	**0**
16:45 to 17:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	176	4	9	**189**	0	0	0	**0**
17:00 to 18:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	182	2	9	**193**	0	0	0	**0**
PM Totals	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**334**	**6**	**16**	**356**	**0**	**0**	**0**	**0**

Table 1.5 Glenfield Road & Hurlstone Agricultural College & South-West Railway Access

Job No. : N1415
Client : ARC
Suburb : Glenfield
Location : 3. Glenfield Rd / Railway Parking

Day/Date : Wed, 21st May 2014
Weather : Fine
Description : Classified Intersection Count 0.006 0.243 0.751
: Hourly Summary 321



SKYTRON - THE TRAFFIC SURVEY COMPANY

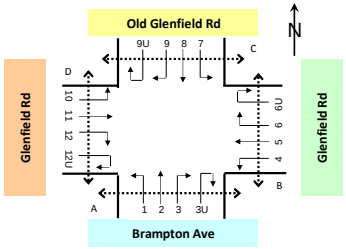
Approach	Hurlstone Ag College																Glenfield Rd															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	1	1	0	**2**	77	1	0	**78**	239	2	0	**241**	0	0	0	**0**	662	5	1	**668**	5	0	0	**5**	525	13	10	**548**	2	0	0	**2**
7:15 to 8:15	0	1	0	**1**	86	1	0	**87**	261	1	1	**263**	0	0	0	**0**	535	4	1	**540**	2	0	0	**2**	582	16	6	**604**	1	0	0	**1**
7:30 to 8:30	0	1	0	**1**	94	1	0	**95**	284	2	1	**287**	0	0	0	**0**	425	4	1	**430**	1	0	0	**1**	590	16	5	**611**	0	0	0	**0**
7:45 to 8:45	0	1	0	**1**	98	0	0	**98**	272	3	1	**276**	0	0	0	**0**	375	2	0	**377**	0	0	0	**0**	589	17	6	**612**	0	0	0	**0**
8:00 to 9:00	0	0	0	**0**	95	0	0	**95**	239	2	1	**242**	0	0	0	**0**	314	0	0	**314**	0	0	0	**0**	545	15	5	**565**	0	0	0	**0**
AM Totals	**1**	**1**	**0**	**2**	**172**	**1**	**0**	**173**	**478**	**4**	**1**	**483**	**0**	**0**	**0**	**0**	**976**	**5**	**1**	**982**	**5**	**0**	**0**	**5**	**1,070**	**28**	**15**	**1,113**	**2**	**0**	**0**	**2**
16:00 to 17:00	0	0	0	**0**	42	0	0	**42**	211	1	1	**213**	0	0	0	**0**	94	1	0	**95**	0	0	0	**0**	566	14	7	**587**	0	0	0	**0**
16:15 to 17:15	0	0	0	**0**	37	0	0	**37**	251	3	1	**255**	0	0	0	**0**	106	1	0	**107**	1	0	0	**1**	546	12	8	**566**	0	0	0	**0**
16:30 to 17:30	0	0	0	**0**	35	0	0	**35**	287	3	0	**290**	0	0	0	**0**	124	1	0	**125**	1	0	0	**1**	541	12	8	**561**	0	0	0	**0**
16:45 to 17:45	0	0	0	**0**	35	0	0	**35**	343	2	0	**345**	0	0	0	**0**	143	0	0	**143**	1	0	0	**1**	513	12	7	**532**	0	0	0	**0**
17:00 to 18:00	0	0	0	**0**	33	0	0	**33**	408	2	0	**410**	0	0	0	**0**	170	0	0	**170**	1	0	0	**1**	504	8	9	**521**	0	0	0	**0**
PM Totals	**0**	**0**	**0**	**0**	**75**	**0**	**0**	**75**	**619**	**3**	**1**	**623**	**0**	**0**	**0**	**0**	**264**	**1**	**0**	**265**	**1**	**0**	**0**	**1**	**1,070**	**22**	**16**	**1,108**	**0**	**0**	**0**	**0**

Approach	Glenfield Rd																SW Railway Access															
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	405	17	9	**431**	48	0	0	**48**	12	0	0	**12**	0	0	0	**0**	15	2	0	**17**	2	0	0	**2**	4	0	0	**4**	0	0	0	**0**
7:15 to 8:15	418	13	9	**440**	56	1	0	**57**	10	0	0	**10**	0	0	0	**0**	14	2	0	**16**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**
7:30 to 8:30	413	11	9	**433**	72	2	0	**74**	12	0	0	**12**	0	0	0	**0**	13	0	0	**13**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**
7:45 to 8:45	411	9	8	**428**	92	2	0	**94**	14	0	0	**14**	0	0	0	**0**	10	0	0	**10**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**
8:00 to 9:00	402	7	8	**417**	85	2	0	**87**	11	0	0	**11**	1	0	0	**1**	8	0	0	**8**	2	1	0	**3**	4	0	0	**4**	0	0	0	**0**
AM Totals	**807**	**24**	**17**	**848**	**133**	**2**	**0**	**135**	**23**	**0**	**0**	**23**	**1**	**0**	**0**	**1**	**23**	**2**	**0**	**25**	**4**	**1**	**0**	**5**	**8**	**0**	**0**	**8**	**0**	**0**	**0**	**0**
16:00 to 17:00	545	10	7	**562**	11	0	0	**11**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	13	0	0	**13**	0	0	0	**0**	0	0	0	**0**
16:15 to 17:15	535	12	8	**555**	12	1	0	**13**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	9	0	0	**9**	2	0	0	**2**	0	0	0	**0**
16:30 to 17:30	540	14	7	**561**	12	1	0	**13**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	9	0	0	**9**	2	0	0	**2**	0	0	0	**0**
16:45 to 17:45	550	12	8	**570**	12	1	0	**13**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	5	0	0	**5**	2	0	0	**2**	0	0	0	**0**
17:00 to 18:00	565	10	9	**584**	15	1	0	**16**	1	0	0	**1**	0	0	0	**0**	6	0	0	**6**	8	0	0	**8**	2	0	0	**2**	0	0	0	**0**
PM Totals	**1,110**	**20**	**16**	**1,146**	**26**	**1**	**0**	**27**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**10**	**21**	**0**	**0**	**21**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**

Table 1.6 Glenfield Road & Brampton Avenue & Old Glenfield Road

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Glenfield Rd/Old Glenfield Rd/Brampton Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



SKYHIGH - THE TRAFFIC SURVEY COMPANY

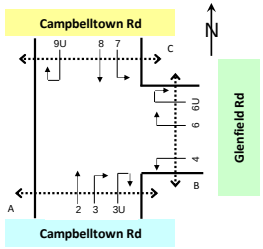
Approach	Brampton Ave																Glenfield Rd											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	127	2	0	**129**	0	0	0	**0**	107	1	0	**108**	0	0	0	**0**	29	0	0	**29**	566	10	11	**587**	2	0	0	**2**	0	0	0	**0**
7:15 to 8:15	139	2	0	**141**	0	0	0	**0**	107	1	0	**108**	0	0	0	**0**	32	0	0	**32**	582	9	9	**600**	1	0	0	**1**	0	0	0	**0**
7:30 to 8:30	135	3	0	**138**	0	0	0	**0**	107	0	0	**107**	0	0	0	**0**	32	0	0	**32**	569	10	7	**586**	1	0	0	**1**	0	0	0	**0**
7:45 to 8:45	123	4	0	**127**	0	0	0	**0**	93	0	0	**93**	0	0	0	**0**	27	0	0	**27**	581	9	7	**597**	1	0	0	**1**	0	0	0	**0**
8:00 to 9:00	111	4	0	**115**	0	0	0	**0**	77	0	0	**77**	0	0	0	**0**	23	0	0	**23**	524	12	5	**541**	1	0	0	**1**	0	0	0	**0**
AM Totals	**238**	**6**	**0**	**244**	**0**	**0**	**0**	**0**	**184**	**1**	**0**	**185**	**0**	**0**	**0**	**0**	**52**	**0**	**0**	**52**	**1,090**	**22**	**16**	**1,128**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
16:00 to 17:00	55	2	0	**57**	0	0	0	**0**	22	0	0	**22**	0	0	0	**0**	24	0	0	**24**	594	12	8	**614**	0	0	0	**0**	0	0	0	**0**
16:15 to 17:15	53	0	0	**53**	0	0	0	**0**	21	0	0	**21**	0	0	0	**0**	31	0	0	**31**	615	23	9	**647**	0	0	0	**0**	0	0	0	**0**
16:30 to 17:30	57	0	0	**57**	0	0	0	**0**	28	0	0	**28**	0	0	0	**0**	36	0	0	**36**	671	28	9	**708**	0	0	0	**0**	0	0	0	**0**
16:45 to 17:45	51	0	0	**51**	0	0	0	**0**	30	0	0	**30**	0	0	0	**0**	54	0	0	**54**	671	28	10	**709**	0	0	0	**0**	0	0	0	**0**
17:00 to 18:00	45	0	0	**45**	0	0	0	**0**	36	0	0	**36**	0	0	0	**0**	63	0	0	**63**	704	24	9	**737**	3	0	0	**3**	0	0	0	**0**
PM Totals	**100**	**2**	**0**	**102**	**0**	**0**	**0**	**0**	**58**	**0**	**0**	**58**	**0**	**0**	**0**	**0**	**87**	**0**	**0**	**87**	**1,298**	**36**	**17**	**1,351**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**

Approach	Old Glenfield Rd																Glenfield Rd											
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	2	1	0	**3**	844	16	10	**870**	32	4	0	**36**	0	0	0	**0**
7:15 to 8:15	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	2	1	0	**3**	782	17	9	**808**	25	3	0	**28**	0	0	0	**0**
7:30 to 8:30	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	688	13	8	**709**	22	2	0	**24**	0	0	0	**0**
7:45 to 8:45	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	3	0	0	**3**	646	10	5	**661**	26	4	0	**30**	0	0	0	**0**
8:00 to 9:00	1	0	0	**1**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	571	9	5	**585**	32	2	0	**34**	0	0	0	**0**
AM Totals	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**6**	**1,415**	**25**	**15**	**1,455**	**64**	**6**	**0**	**70**	**0**	**0**	**0**	**0**
16:00 to 17:00	2	0	0	**2**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**	6	0	0	**6**	517	12	11	**540**	86	1	0	**87**	0	0	0	**0**
16:15 to 17:15	2	0	0	**2**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**	5	0	0	**5**	548	14	11	**573**	77	1	0	**78**	1	0	0	**1**
16:30 to 17:30	2	0	0	**2**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**	4	0	0	**4**	538	11	12	**561**	80	1	0	**81**	1	0	0	**1**
16:45 to 17:45	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	6	0	0	**6**	536	8	11	**555**	100	1	0	**101**	1	0	0	**1**
17:00 to 18:00	1	0	0	**1**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	536	6	8	**550**	109	1	0	**110**	1	0	0	**1**
PM Totals	**3**	**0**	**0**	**3**	**1**	**0**	**0**	**1**	**5**	**1**	**0**	**6**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**11**	**1,053**	**18**	**19**	**1,090**	**195**	**2**	**0**	**197**	**1**	**0**	**0**	**1**

Table 1.7 Campbelltown Road & Glenfield Road

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Campbelltown Rd/Glenfield Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Campbelltown Rd												Glenfield Rd											
Direction	Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	728	37	3	**768**	127	3	1	**131**	2	0	0	**2**	67	6	0	**73**	595	8	10	**613**	0	0	0	**0**
7:15 to 8:15	675	41	5	**721**	107	3	1	**111**	2	0	0	**2**	64	4	0	**68**	645	9	8	**662**	0	0	0	**0**
7:30 to 8:30	551	41	7	**599**	98	2	0	**100**	2	0	0	**2**	59	2	0	**61**	628	12	5	**645**	0	0	0	**0**
7:45 to 8:45	473	34	6	**513**	94	5	0	**99**	0	0	0	**0**	64	3	0	**67**	619	11	6	**636**	0	0	0	**0**
8:00 to 9:00	418	33	4	**455**	89	4	0	**93**	0	0	0	**0**	66	2	0	**68**	568	14	5	**587**	0	0	0	**0**
AM Totals	**1,146**	**70**	**7**	**1,223**	**216**	**7**	**1**	**224**	**2**	**0**	**0**	**2**	**133**	**8**	**0**	**141**	**1,163**	**22**	**15**	**1,200**	**0**	**0**	**0**	**0**
16:00 to 17:00	356	19	0	**375**	79	0	1	**80**	1	0	0	**1**	130	2	0	**132**	526	9	8	**543**	0	0	0	**0**
16:15 to 17:15	321	15	0	**336**	74	0	1	**75**	1	0	0	**1**	123	4	0	**127**	549	17	8	**574**	0	0	0	**0**
16:30 to 17:30	333	14	0	**347**	81	0	1	**82**	1	0	0	**1**	115	4	0	**119**	610	22	9	**641**	0	0	0	**0**
16:45 to 17:45	323	17	0	**340**	85	0	0	**85**	0	0	0	**0**	118	4	0	**122**	590	21	10	**621**	0	0	0	**0**
17:00 to 18:00	303	15	0	**318**	78	0	0	**78**	0	0	0	**0**	122	4	0	**126**	626	17	9	**652**	0	0	0	**0**
PM Totals	**659**	**34**	**0**	**693**	**157**	**0**	**1**	**158**	**1**	**0**	**0**	**1**	**252**	**6**	**0**	**258**	**1,152**	**26**	**17**	**1,195**	**0**	**0**	**0**	**0**

Approach	Campbelltown Rd											
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	727	20	8	**755**	725	85	1	**811**	1	0	0	**1**
7:15 to 8:15	650	17	6	**673**	778	79	1	**858**	0	0	0	**0**
7:30 to 8:30	605	14	7	**626**	803	93	0	**896**	0	0	0	**0**
7:45 to 8:45	567	10	6	**583**	798	89	0	**887**	0	0	0	**0**
8:00 to 9:00	525	7	5	**537**	823	89	1	**913**	0	0	0	**0**
AM Totals	**1,252**	**27**	**13**	**1,292**	**1,548**	**174**	**2**	**1,724**	**1**	**0**	**0**	**1**
16:00 to 17:00	533	12	14	**559**	1,556	79	2	**1,637**	1	0	0	**1**
16:15 to 17:15	567	12	13	**592**	1,593	76	2	**1,671**	0	0	0	**0**
16:30 to 17:30	537	15	11	**563**	1,646	68	2	**1,716**	1	0	0	**1**
16:45 to 17:45	571	11	7	**589**	1,687	62	1	**1,750**	1	0	0	**1**
17:00 to 18:00	576	7	8	**591**	1,655	55	1	**1,711**	1	0	0	**1**
PM Totals	**1,109**	**19**	**22**	**1,150**	**3,211**	**134**	**3**	**3,348**	**2**	**0**	**0**	**2**

Table 2.1 Cambridge Avenue Average Daily Traffic Two-Way

Job No	N1284
Client	ARC
Road	Cambridge Avenue 100m west of GWS Road 1
Location	Glenfield
Site No.	2
Start Date	12-Dec-13
Description	Volume Summary
Direction	Combined

Average Weekday	17,225
7 Day Average	15,421

	Day of Week								
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave	7 Day
Time	16-Dec	17-Dec	18-Dec	12-Dec	13-Dec	14-Dec	15-Dec	W'day	Ave
AM Peak	1423	1465	1426	1511	1461	731	591		
PM Peak	1569	1483	1523	1614	1483	812	680		
0:00	128	139	127	148	141	252	270	137	172
1:00	70	89	75	94	103	140	142	86	102
2:00	56	74	94	81	86	119	93	78	86
3:00	85	106	107	114	119	138	96	106	109
4:00	227	234	233	244	232	176	114	234	209
5:00	796	838	882	866	852	365	187	847	684
6:00	1423	1465	1426	1511	1461	478	233	1457	1142
7:00	1362	1400	1322	1479	1360	466	220	1385	1087
8:00	1178	1168	1135	1174	1152	566	347	1161	960
9:00	730	707	682	669	723	693	477	702	669
10:00	613	593	599	587	580	731	528	594	604
11:00	548	545	566	501	586	683	591	549	574
12:00	650	636	608	581	678	765	680	631	657
13:00	783	750	706	673	793	800	643	741	735
14:00	950	956	877	914	1005	812	679	940	885
15:00	1337	1321	1216	1330	1295	766	644	1300	1130
16:00	1480	1440	1428	1534	1402	806	636	1457	1247
17:00	1569	1483	1523	1614	1483	745	624	1534	1292
18:00	1138	1110	990	1123	1128	708	580	1098	968
19:00	601	597	595	602	577	468	506	594	564
20:00	584	426	499	480	464	368	437	491	465
21:00	482	399	442	473	465	361	442	452	438
22:00	373	305	394	375	442	378	323	378	370
23:00	273	240	252	263	333	349	200	272	273
Total	17433	17022	16778	17430	17460	12133	9692	17225	15421
7-19	12336	12109	11652	12179	12185	8541	6649	12092	10807
6-22	15426	14996	14614	15245	15152	10216	8267	15087	13417
6-24	16071	15541	15260	15883	15927	10943	8790	15736	14059
0-24	17433	17022	16778	17430	17460	12133	9692	17225	15421

Table 2.2 Cambridge Avenue Average Daily Traffic Eastbound

Job No	N1284
Client	ARC
Road	Cambridge Avenue 100m west of GWS Road 1
Location	Glenfield
Site No.	2
Start Date	12-Dec-13
Description	Volume Summary
Direction	EB

Average Weekday	8,670
7 Day Average	7,743

Time	Day of Week							Ave W'day	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	16-Dec	17-Dec	18-Dec	12-Dec	13-Dec	14-Dec	15-Dec		
AM Peak	1274	1294	1231	1323	1285	443	359		
PM Peak	429	428	355	427	428	353	340		
0:00	33	30	25	32	26	76	63	29	41
1:00	27	35	27	39	39	50	46	33	38
2:00	29	38	44	44	42	66	41	39	43
3:00	64	72	78	81	72	65	42	73	68
4:00	199	199	195	205	193	106	66	198	166
5:00	750	781	823	809	783	303	129	789	625
6:00	1274	1294	1231	1323	1285	382	159	1281	993
7:00	1157	1174	1129	1230	1134	328	135	1165	898
8:00	885	867	821	864	853	380	239	858	701
9:00	486	470	439	459	465	443	329	464	442
10:00	356	345	373	356	322	408	345	350	358
11:00	307	299	328	271	319	370	359	305	322
12:00	321	314	289	291	329	353	340	309	319
13:00	354	329	352	317	316	349	319	334	334
14:00	341	354	314	366	356	341	316	346	341
15:00	429	428	355	427	428	323	277	413	381
16:00	339	294	316	326	341	318	269	323	315
17:00	359	306	294	323	366	346	259	330	322
18:00	305	278	237	276	328	309	252	285	284
19:00	238	187	207	213	254	225	217	220	220
20:00	190	154	185	189	188	167	205	181	183
21:00	177	144	151	169	176	147	182	163	164
22:00	116	95	102	120	141	152	103	115	118
23:00	65	56	65	61	85	103	50	66	69
Total	8798	8543	8380	8791	8841	6110	4742	8670	7743
7-19	5637	5457	5247	5506	5557	4268	3439	5481	5016
6-22	7515	7236	7021	7400	7460	5189	4202	7326	6575
6-24	7696	7387	7188	7581	7686	5444	4355	7508	6762
0-24	8798	8543	8380	8791	8841	6110	4742	8670	7743

Table 2.3 Cambridge Avenue Average Daily Traffic Westbound

Job No	N1284
Client	ARC
Road	Cambridge Avenue 100m west of GWS Road 1
Location	Glenfield
Site No.	2
Start Date	12-Dec-13
Description	Volume Summary
Direction	WB

Average Weekday	8,554
7 Day Average	7,678

	Day of Week							Ave	7 Day
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	W'day	Ave
Time	16-Dec	17-Dec	18-Dec	12-Dec	13-Dec	14-Dec	15-Dec		
AM Peak	293	301	314	310	299	323	232		
PM Peak	1211	1177	1229	1291	1117	488	367		
0:00	95	109	102	116	115	176	207	107	131
1:00	43	54	48	55	64	90	96	53	64
2:00	27	36	50	37	44	53	52	39	43
3:00	21	34	29	33	47	73	54	33	42
4:00	28	35	38	39	39	70	48	36	42
5:00	46	57	59	57	69	62	58	58	58
6:00	149	171	195	188	176	96	74	176	150
7:00	205	227	193	249	226	138	85	220	189
8:00	293	301	314	310	299	186	108	303	259
9:00	244	237	243	210	258	250	148	238	227
10:00	257	249	226	231	258	323	183	244	247
11:00	241	246	238	230	267	313	232	244	252
12:00	330	323	319	290	349	412	340	322	337
13:00	429	421	354	356	477	451	324	407	402
14:00	609	602	563	548	649	471	363	594	544
15:00	908	893	861	903	867	443	367	886	749
16:00	1142	1146	1112	1208	1061	488	367	1134	932
17:00	1211	1177	1229	1291	1117	399	365	1205	970
18:00	833	832	753	847	800	399	328	813	685
19:00	364	410	388	389	323	243	289	375	344
20:00	394	272	314	291	276	201	232	309	283
21:00	305	255	291	304	289	214	260	289	274
22:00	257	210	292	255	301	226	220	263	252
23:00	209	184	187	202	248	246	150	206	204
Total	8636	8479	8398	8639	8619	6023	4950	8554	7678
7-19	6700	6652	6405	6673	6628	4273	3210	6612	5792
6-22	7911	7760	7593	7845	7692	5027	4065	7760	6842
6-24	8376	8154	8072	8302	8241	5499	4435	8229	7297
0-24	8636	8479	8398	8639	8619	6023	4950	8554	7678

Table 2.4 Cambridge Avenue Vehicle Class Summary

Road Cambridge Avenue 100m west of GWS Road 1
Location Glenfield
Site No. 2
Start Date 12-Dec-13
Day Weekday Ave.
Description Class Summary

M'Cycle & P'Cycle	1%
Cars	95%
LGV	3%
OGV1 & PSV	1%
OGV2	0%

	EB						WB						Combined					
	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total
0:00	0	28	1	0	0	29	1	104	3	0	0	107	1	131	3	1	0	137
1:00	0	33	0	0	0	33	1	50	1	1	0	53	1	83	1	1	0	86
2:00	0	38	0	1	0	39	0	37	1	0	0	39	0	75	1	2	0	78
3:00	1	69	3	0	1	73	0	32	0	1	0	33	1	101	4	1	1	106
4:00	1	185	8	2	2	198	1	33	2	0	0	36	2	218	10	2	2	234
5:00	2	742	40	4	2	789	1	54	2	0	1	58	3	796	42	4	3	847
6:00	6	1200	60	12	4	1281	2	167	5	2	0	176	8	1366	65	14	4	1457
7:00	3	1115	38	6	3	1165	1	208	8	3	0	220	4	1323	46	8	3	1385
8:00	2	823	24	8	2	858	2	287	11	3	0	303	3	1110	35	11	3	1161
9:00	3	434	18	5	4	464	2	223	10	4	0	238	5	657	28	9	4	702
10:00	1	322	18	4	4	350	1	218	18	6	2	244	2	540	36	10	6	594
11:00	0	281	15	6	3	305	3	223	15	3	1	244	3	504	29	9	4	549
12:00	0	294	11	2	2	309	3	302	12	3	2	322	3	596	23	5	4	631
13:00	1	314	16	2	1	334	3	380	20	4	2	407	4	694	35	6	2	741
14:00	1	322	20	3	0	346	6	554	25	4	5	594	7	876	44	7	6	940
15:00	1	398	11	2	1	413	15	832	30	4	4	886	16	1231	42	6	5	1300
16:00	1	313	9	1	0	323	11	1079	31	8	5	1134	12	1392	39	9	5	1457
17:00	0	319	9	1	0	330	9	1143	37	11	4	1205	10	1463	47	11	5	1534
18:00	1	276	8	0	1	285	5	785	21	1	2	813	5	1061	28	1	3	1098
19:00	1	213	6	0	0	220	0	363	11	0	0	375	1	576	17	0	0	594
20:00	0	178	3	0	0	181	1	302	6	0	0	309	1	480	9	0	0	491
21:00	0	160	3	0	0	163	0	286	2	0	0	289	0	446	5	0	1	452
22:00	0	113	2	0	0	115	4	257	2	0	0	263	4	370	4	0	0	378
23:00	0	65	1	0	0	66	3	202	2	0	0	206	3	267	3	0	0	272
Total	24	8234	323	59	31	8670	75	8119	273	57	30	8554	99	16352	597	116	61	17225

Table 2.5 Skyhigh Traffic Vehicle Classification Scheme

Level 1	Level 2		Level 3	ARX			
Length	Axles and Groups		Vehicle Type	Classification			
Type	Axles	Groups	Description	Class		Parameters	Spreadsheet Classification
Short	Light Vehicles						
up to 5.5m	2	1 or 2	Very Short Bicycle or Motorcycle	MC	1	d(1) < 1.7m and axles = 2	M'Cycles
	2	1 or 2	Short Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc.	SV	2	d(1) >= 1.7m, d(1) <= 3.2m and axles = 2	Cars
Medium 5.5m to 14.5m	3, 4 or 5	3	Short - Towing Trailer, Caravan, Boat, etc.	SVT	3	groups = 3, d(1) >= 2.1m, d(1) <= 3.2m, d(2) >= 2.1m and axles = 3,4,5	
	Heavy Vehicles						
	2	2	Two Axle Truck or Bus	TB2	4	d(1) > 3.2m and axles = 2	LGV
	3	2	Three Axle Truck or Bus	TB3	5	axles = 3 and groups = 2	OGV & PSV
	> 3	2	Four Axle Truck	T4	6	axles > 3 and groups = 2	
Long 11.5m to 19.0m	3	3	Three Axle Articulated Three axle articulated vehicle or Rigid vehicle and trailer	ART3	7	d(1) > 3.2m, axles = 3 and groups = 3	OGV2
	4	> 2	Four Axle Articulated Four axle articulated vehicle or Rigid vehicle and trailer	ART4	8	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2	
	5	> 2	Five Axle Articulated Five axle articulated vehicle or Rigid vehicle and trailer	ART5	9	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2	
	>= 6	> 2	Six Axle Articulated Six (or more) axle articulated vehicle or Rigid vehicle and trailer	ART6	10	axles = 6 and groups > 2 or axles > 6 and groups = 3	
Medium and Long Combination	> 6	4	B Double B Double or Heavy truck and trailer	BD	11	groups = 4 and axles > 6	
Over 17.5m	> 6	>=5	Double or Triple Road Train Double road train or Heavy truck and two trailers	DRT	12	groups = 5 or 6 and axles > 6	

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix A Traffic Survey Data

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Table 1.5 Intersection Glenfield Road & Hurlstone Agricultural College

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2 Cambridge Avenue Automatic Traffic Counter

Table 2.1 Average Daily Traffic (Two-Way)

Table 2.2 Average Daily Traffic (Eastbound)

Table 2.3 Average Daily Traffic (Westbound)

Table 2.4 Vehicle Class Summary

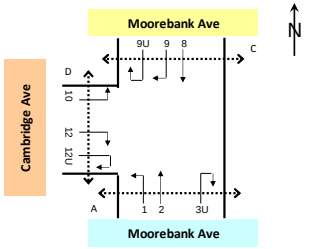
Table 2.5 Skyhigh Traffic Vehicle Classification Scheme

All traffic surveys conducted and reported by Skyhigh Traffic.

Table 1.1 Cambridge Avenue & Moorebank Avenue

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Cambridge Ave/Moorebank Ave

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Moorebank Ave											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	8	3	0	**11**	36	5	1	**42**	0	0	0	**0**
7:15 to 8:15	10	4	0	**14**	53	4	1	**58**	0	0	0	**0**
7:30 to 8:30	11	6	0	**17**	68	3	0	**71**	0	0	0	**0**
7:45 to 8:45	11	5	0	**16**	76	5	0	**81**	0	0	0	**0**
8:00 to 9:00	10	5	1	**16**	79	6	0	**85**	0	0	0	**0**
AM Totals	**18**	**8**	**1**	**27**	**115**	**11**	**1**	**127**	**0**	**0**	**0**	**0**
16:00 to 17:00	30	7	0	**37**	58	10	0	**68**	0	0	0	**0**
16:15 to 17:15	43	14	0	**57**	52	6	0	**58**	0	0	0	**0**
16:30 to 17:30	43	16	0	**59**	36	4	0	**40**	0	0	0	**0**
16:45 to 17:45	53	15	0	**68**	35	4	0	**39**	0	0	0	**0**
17:00 to 18:00	63	14	0	**77**	34	1	0	**35**	0	0	0	**0**
PM Totals	**93**	**21**	**0**	**114**	**92**	**11**	**0**	**103**	**0**	**0**	**0**	**0**

Approach	Moorebank Ave												Cambridge Ave							
Direction	Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	150	9	4	**163**	238	8	0	**246**	0	0	0	**0**	1,135	39	0	**1,174**	86	2	0	**88**	0	0	0	**0**
7:15 to 8:15	107	4	4	**115**	264	11	0	**275**	0	0	0	**0**	1,113	36	0	**1,149**	63	2	0	**65**	0	0	0	**0**
7:30 to 8:30	85	3	1	**89**	289	17	0	**306**	0	0	0	**0**	1,056	29	1	**1,086**	38	2	0	**40**	0	0	0	**0**
7:45 to 8:45	86	3	0	**89**	293	19	3	**315**	0	0	0	**0**	983	25	2	**1,010**	34	3	0	**37**	0	0	0	**0**
8:00 to 9:00	88	5	0	**93**	280	16	6	**302**	0	0	0	**0**	847	25	2	**874**	33	2	0	**35**	0	0	0	**0**
AM Totals	**238**	**14**	**4**	**256**	**518**	**24**	**6**	**548**	**0**	**0**	**0**	**0**	**1,982**	**64**	**2**	**2,048**	**119**	**4**	**0**	**123**	**0**	**0**	**0**	**0**
16:00 to 17:00	17	4	0	**21**	1,125	30	0	**1,155**	0	0	0	**0**	331	4	1	**336**	1	1	0	**2**	0	0	0	**0**
16:15 to 17:15	14	4	0	**18**	1,143	28	0	**1,171**	0	0	0	**0**	330	3	1	**334**	2	1	0	**3**	0	0	0	**0**
16:30 to 17:30	12	1	0	**13**	1,191	22	0	**1,213**	0	0	0	**0**	326	4	1	**331**	5	1	0	**6**	0	0	0	**0**
16:45 to 17:45	12	1	0	**13**	1,209	25	0	**1,234**	0	0	0	**0**	328	4	1	**333**	8	1	0	**9**	0	0	0	**0**
17:00 to 18:00	14	1	0	**15**	1,193	26	0	**1,219**	0	0	0	**0**	326	3	1	**330**	10	0	0	**10**	0	0	0	**0**
PM Totals	**31**	**5**	**0**	**36**	**2,318**	**56**	**0**	**2,374**	**0**	**0**	**0**	**0**	**657**	**7**	**2**	**666**	**11**	**1**	**0**	**12**	**0**	**0**	**0**	**0**

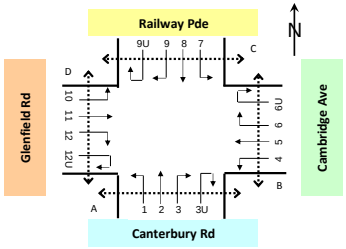
Table 1.2 Cambridge Avenue & GWS Road 1

Approach			Cambridge Avenue Westbound								GWS Road 1								Cambridge Avenue Eastbound							
Direction			Through				Right Turn				Left Turn				Right Turn				Left Turn				Through			
Time Period			Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
6:00	to	6:15	26	0	0	**26**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	273	12	0	**285**
6:15	to	6:30	43	2	0	**45**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	294	14	0	**308**
6:30	to	6:45	51	2	0	**53**	1	2	0	**3**	0	1	0	**1**	0	0	0	**0**	0	1	0	**1**	336	14	0	**350**
6:45	to	7:00	56	2	0	**58**	2	0	0	**2**	0	3	0	**3**	0	0	0	**0**	0	1	0	**1**	282	14	0	**296**
7:00	to	7:15	41	3	0	**44**	1	2	0	**3**	1	1	0	**2**	1	0	0	**1**	1	0	0	**1**	316	10	0	**326**
7:15	to	7:30	51	1	0	**52**	0	1	0	**1**	1	1	0	**2**	0	1	0	**1**	0	1	0	**1**	353	3	0	**356**
7:30	to	7:45	59	1	0	**60**	0	1	0	**1**	0	1	0	**1**	0	2	0	**2**	0	2	0	**2**	280	1	0	**281**
7:45	to	8:00	72	1	1	**74**	0	0	0	**0**	0	1	0	**1**	0	3	0	**3**	1	0	0	**1**	281	8	0	**289**
8:00	to	8:15	84	2	0	**86**	0	1	0	**1**	0	1	0	**1**	1	0	0	**1**	0	2	0	**2**	264	8	0	**272**
8:15	to	8:30	87	3	0	**90**	1	0	0	**1**	0	0	0	**0**	0	2	0	**2**	0	1	0	**1**	267	13	2	**282**
8:30	to	8:45	99	2	0	**101**	0	2	0	**2**	0	1	0	**1**	1	1	0	**2**	1	0	0	**1**	244	6	0	**250**
8:45	to	9:00	83	2	0	**85**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	4	0	**4**	162	5	0	**167**
9:00	to	9:15	70	1	0	**71**	2	0	0	**2**	0	2	0	**2**	0	2	0	**2**	1	0	0	**1**	148	2	2	**152**
9:15	to	9:30	46	1	0	**47**	0	0	0	**0**	0	1	0	**1**	2	0	0	**2**	1	0	0	**1**	139	2	1	**142**
9:30	to	9:45	55	0	1	**56**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	106	1	0	**107**
9:45	to	10:00	50	4	0	**54**	0	2	0	**2**	0	0	0	**0**	0	0	0	**0**	1	2	0	**3**	91	4	0	**95**
10:00	to	10:15	44	4	0	**48**	0	3	0	**3**	0	1	0	**1**	1	2	0	**3**	1	3	0	**4**	85	6	0	**91**
10:15	to	10:30	48	5	0	**53**	1	0	0	**1**	0	2	0	**2**	2	3	0	**5**	1	0	0	**1**	74	4	0	**78**
10:30	to	10:45	66	1	0	**67**	0	0	0	**0**	0	1	0	**1**	2	1	0	**3**	0	1	0	**1**	75	2	0	**77**
10:45	to	11:00	56	2	0	**58**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	0	3	0	**3**	78	2	0	**80**
11:00	to	11:15	41	2	1	**44**	0	3	0	**3**	0	0	0	**0**	0	1	0	**1**	2	2	0	**4**	72	1	0	**73**
11:15	to	11:30	52	1	0	**53**	1	1	0	**2**	0	2	0	**2**	2	5	0	**7**	1	0	0	**1**	72	3	0	**75**
11:30	to	11:45	46	5	0	**51**	0	0	0	**0**	0	2	0	**2**	1	1	0	**2**	0	3	0	**3**	64	1	1	**66**
11:45	to	12:00	53	0	0	**53**	0	2	0	**2**	0	2	0	**2**	0	1	0	**1**	0	2	0	**2**	72	3	1	**76**
12:00	to	12:15	58	1	0	**59**	0	1	0	**1**	0	3	0	**3**	1	0	0	**1**	1	0	0	**1**	69	0	1	**70**
12:15	to	12:30	76	4	0	**80**	1	0	0	**1**	0	1	0	**1**	0	1	0	**1**	1	1	0	**2**	97	2	0	**99**
12:30	to	12:45	69	3	0	**72**	0	0	0	**0**	1	0	0	**1**	4	0	0	**4**	3	0	0	**3**	65	0	1	**66**
12:45	to	13:00	68	2	0	**70**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	1	1	0	**2**	83	1	0	**84**
13:00	to	13:15	80	5	0	**85**	0	3	0	**3**	0	0	0	**0**	3	2	0	**5**	0	0	0	**0**	74	1	0	**75**
13:15	to	13:30	81	0	0	**81**	0	2	0	**2**	0	4	0	**4**	0	0	0	**0**	1	1	0	**2**	66	0	1	**67**
13:30	to	13:45	92	3	0	**95**	1	0	0	**1**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	83	1	0	**84**
13:45	to	14:00	90	2	0	**92**	0	1	0	**1**	0	0	0	**0**	1	0	0	**1**	1	2	0	**3**	94	2	1	**97**
14:00	to	14:15	95	2	1	**98**	1	1	0	**2**	0	1	0	**1**	1	1	0	**2**	1	0	0	**1**	90	1	0	**91**
14:15	to	14:30	121	6	0	**127**	1	1	0	**2**	1	0	0	**1**	2	1	0	**3**	1	0	0	**1**	78	1	0	**79**
14:30	to	14:45	137	2	0	**139**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	1	3	0	**4**	106	1	1	**108**
14:45	to	15:00	152	3	2	**157**	0	0	0	**0**	1	1	0	**2**	2	1	0	**3**	0	0	0	**0**	92	0	0	**92**
15:00	to	15:15	178	4	0	**182**	0	2	0	**2**	0	0	0	**0**	0	2	0	**2**	0	1	0	**1**	93	1	0	**94**
15:15	to	15:30	214	3	0	**217**	1	2	0	**3**	0	1	0	**1**	1	1	0	**2**	1	1	0	**2**	128	3	1	**132**
15:30	to	15:45	255	5	0	**260**	1	0	0	**1**	1	1	0	**2**	2	2	0	**4**	0	0	0	**0**	109	1	0	**110**
15:45	to	16:00	229	1	0	**230**	0	0	0	**0**	1	0	0	**1**	0	4	0	**4**	1	0	0	**1**	88	0	0	**88**
16:00	to	16:15	292	5	0	**297**	0	1	0	**1**	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	87	2	0	**89**
16:15	to	16:30	305	9	1	**315**	0	0	0	**0**	0	1	0	**1**	5	1	0	**6**	0	0	0	**0**	83	1	0	**84**
16:30	to	16:45	305	4	0	**309**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	86	0	0	**86**
16:45	to	17:00	287	9	0	**296**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	79	2	0	**81**
17:00	to	17:15	306	7	0	**313**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	85	1	0	**86**
17:15	to	17:30	301	1	0	**302**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	89	0	0	**89**
17:30	to	17:45	288	8	0	**296**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	72	0	0	**72**
17:45	to	18:00	267	4	0	**271**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	60	1	0	**61**
12hr Totals			**5,725**	**140**	**7**	**5,872**	**15**	**36**	**0**	**51**	**8**	**37**	**0**	**45**	**39**	**43**	**0**	**82**	**32**	**38**	**0**	**70**	**6,484**	**161**	**13**	**6,658**

Table 1.3 Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Glenfield Rd/Railway Pde/Canterbury Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



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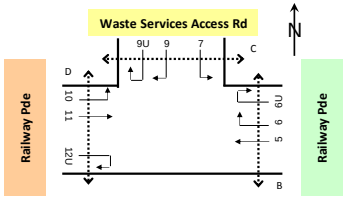
Approach	Canterbury Rd																Cambridge Ave															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	273	4	3	**280**	10	1	0	**11**	833	19	0	**852**	0	0	0	**0**	175	7	0	**182**	41	1	0	**42**	22	1	0	**23**	0	0	0	**0**
7:15 to 8:15	266	1	4	**271**	10	1	0	**11**	798	20	0	**818**	0	0	0	**0**	185	9	0	**194**	51	2	0	**53**	22	1	0	**23**	0	0	0	**0**
7:30 to 8:30	265	5	1	**271**	10	1	0	**11**	739	19	0	**758**	1	0	0	**1**	204	11	0	**215**	54	2	0	**56**	30	1	0	**31**	0	0	0	**0**
7:45 to 8:45	272	5	2	**279**	10	0	0	**10**	678	19	0	**697**	1	0	0	**1**	205	13	0	**218**	58	2	0	**60**	39	2	2	**43**	0	0	0	**0**
8:00 to 9:00	257	9	2	**268**	10	0	0	**10**	579	18	0	**597**	1	0	0	**1**	191	12	1	**204**	51	2	0	**53**	43	2	5	**50**	0	0	0	**0**
AM Totals	**530**	**13**	**5**	**548**	**20**	**1**	**0**	**21**	**1,412**	**37**	**0**	**1,449**	**1**	**0**	**0**	**1**	**366**	**19**	**1**	**386**	**92**	**3**	**0**	**95**	**65**	**3**	**5**	**73**	**0**	**0**	**0**	**0**
16:00 to 17:00	199	3	0	**202**	11	0	0	**11**	235	1	1	**237**	0	0	0	**0**	778	20	0	**798**	132	9	0	**141**	229	12	0	**241**	0	0	0	**0**
16:15 to 17:15	191	4	0	**195**	14	0	0	**14**	235	1	1	**237**	0	0	0	**0**	804	19	0	**823**	137	18	0	**155**	242	11	0	**253**	0	0	0	**0**
16:30 to 17:30	185	3	0	**188**	13	0	0	**13**	230	3	1	**234**	0	0	0	**0**	829	14	0	**843**	135	23	0	**158**	260	7	0	**267**	0	0	0	**0**
16:45 to 17:45	180	4	0	**184**	10	0	0	**10**	236	3	0	**239**	1	0	0	**1**	845	16	0	**861**	139	22	0	**161**	254	8	0	**262**	0	0	0	**0**
17:00 to 18:00	189	2	0	**191**	6	0	0	**6**	228	3	0	**231**	1	0	0	**1**	856	21	0	**877**	148	18	0	**166**	244	5	0	**249**	0	0	0	**0**
PM Totals	**388**	**5**	**0**	**393**	**17**	**0**	**0**	**17**	**463**	**4**	**1**	**468**	**1**	**0**	**0**	**1**	**1,634**	**41**	**0**	**1,675**	**280**	**27**	**0**	**307**	**473**	**17**	**0**	**490**	**0**	**0**	**0**	**0**

Approach	Railway Pde																Glenfield Rd															
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	263	14	0	**277**	5	0	0	**5**	104	3	6	**113**	0	0	0	**0**	173	3	7	**183**	127	3	0	**130**	98	6	1	**105**	0	0	0	**0**
7:15 to 8:15	239	15	0	**254**	4	0	0	**4**	111	3	5	**119**	0	0	0	**0**	207	4	7	**218**	110	2	0	**112**	126	7	1	**134**	0	0	0	**0**
7:30 to 8:30	230	9	0	**239**	4	0	0	**4**	119	3	4	**126**	0	0	0	**0**	211	3	7	**221**	99	1	1	**101**	158	6	1	**165**	0	0	0	**0**
7:45 to 8:45	210	5	0	**215**	0	0	0	**0**	111	2	5	**118**	0	0	0	**0**	204	2	5	**211**	102	2	2	**106**	192	5	1	**198**	0	0	0	**0**
8:00 to 9:00	177	3	0	**180**	0	1	0	**1**	101	3	3	**107**	0	0	0	**0**	174	1	5	**180**	95	1	2	**98**	212	6	0	**218**	0	0	0	**0**
AM Totals	**440**	**17**	**0**	**457**	**5**	**1**	**0**	**6**	**205**	**6**	**9**	**220**	**0**	**0**	**0**	**0**	**347**	**4**	**12**	**363**	**222**	**4**	**2**	**228**	**310**	**12**	**1**	**323**	**0**	**0**	**0**	**0**
16:00 to 17:00	70	3	0	**73**	7	0	0	**7**	82	1	7	**90**	1	0	0	**1**	168	5	7	**180**	46	0	0	**46**	282	9	3	**294**	1	0	0	**1**
16:15 to 17:15	65	3	0	**68**	7	0	0	**7**	91	1	7	**99**	1	0	0	**1**	182	6	6	**194**	46	0	0	**46**	288	10	4	**302**	1	0	0	**1**
16:30 to 17:30	63	3	0	**66**	6	0	0	**6**	101	3	9	**113**	1	0	0	**1**	185	3	7	**195**	51	0	0	**51**	263	7	4	**274**	0	0	0	**0**
16:45 to 17:45	63	1	0	**64**	4	0	0	**4**	115	3	9	**127**	0	0	0	**0**	184	1	9	**194**	49	0	0	**49**	275	6	2	**283**	0	0	0	**0**
17:00 to 18:00	65	0	0	**65**	1	0	0	**1**	118	2	9	**129**	0	0	0	**0**	174	1	6	**181**	51	0	0	**51**	266	3	2	**271**	0	0	0	**0**
PM Totals	**135**	**3**	**0**	**138**	**8**	**0**	**0**	**8**	**200**	**3**	**16**	**219**	**1**	**0**	**0**	**1**	**342**	**6**	**13**	**361**	**97**	**0**	**0**	**97**	**548**	**12**	**5**	**565**	**1**	**0**	**0**	**1**

Table 1.4 Railway Parade & GWS 2

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Railway Pde/Waste Services Access Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



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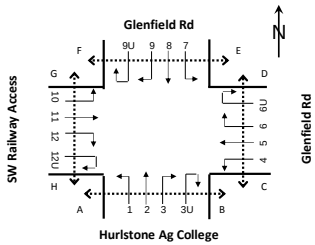
Approach	Railway Pde											
Direction	Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	198	5	7	**210**	6	0	0	**6**	0	0	0	**0**
7:15 to 8:15	238	7	7	**252**	7	1	0	**8**	0	0	0	**0**
7:30 to 8:30	236	5	6	**247**	9	1	0	**10**	0	0	0	**0**
7:45 to 8:45	245	4	7	**256**	8	1	0	**9**	0	0	0	**0**
8:00 to 9:00	223	4	11	**238**	8	1	0	**9**	0	0	0	**0**
AM Totals	**421**	**9**	**18**	**448**	**14**	**1**	**0**	**15**	**0**	**0**	**0**	**0**
16:00 to 17:00	403	17	7	**427**	0	0	0	**0**	1	0	0	**1**
16:15 to 17:15	421	16	6	**443**	0	0	0	**0**	1	0	0	**1**
16:30 to 17:30	442	9	7	**458**	0	0	0	**0**	1	0	0	**1**
16:45 to 17:45	427	8	9	**444**	0	0	0	**0**	1	0	0	**1**
17:00 to 18:00	410	5	6	**421**	0	0	0	**0**	0	0	0	**0**
PM Totals	**813**	**22**	**13**	**848**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**

Approach	Glenfield Waste Services Road 2												Railway Pde											
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	6	0	0	**6**	1	1	0	**2**	0	0	0	**0**	0	0	0	**0**	357	17	6	**380**	0	0	0	**0**
7:15 to 8:15	5	1	0	**6**	1	1	0	**2**	0	0	0	**0**	1	0	0	**1**	341	19	6	**366**	2	0	0	**2**
7:30 to 8:30	6	1	0	**7**	1	1	0	**2**	0	0	0	**0**	1	0	0	**1**	337	13	6	**356**	2	0	0	**2**
7:45 to 8:45	4	1	0	**5**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	309	8	6	**323**	2	0	0	**2**
8:00 to 9:00	3	1	0	**4**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	270	7	5	**282**	2	0	0	**2**
AM Totals	**9**	**1**	**0**	**10**	**1**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**627**	**24**	**11**	**662**	**2**	**0**	**0**	**2**
16:00 to 17:00	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	152	4	7	**163**	0	0	0	**0**
16:15 to 17:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	152	4	7	**163**	0	0	0	**0**
16:30 to 17:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	161	6	9	**176**	0	0	0	**0**
16:45 to 17:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	176	4	9	**189**	0	0	0	**0**
17:00 to 18:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	182	2	9	**193**	0	0	0	**0**
PM Totals	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**334**	**6**	**16**	**356**	**0**	**0**	**0**	**0**

Table 1.5 Glenfield Road & Hurlstone Agricultural College & South-West Railway Access

Job No. : N1415
Client : ARC
Suburb : Glenfield
Location : 3. Glenfield Rd / Railway Parking

Day/Date : Wed, 21st May 2014
Weather : Fine
Description : Classified Intersection Count 0.006 0.243 0.751
: Hourly Summary 321



SKYTRON - THE TRAFFIC SURVEY COMPANY

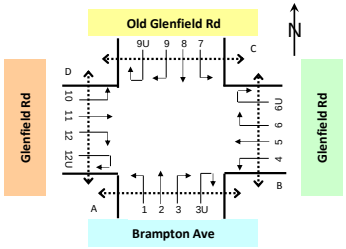
Approach	Hurlstone Ag College																Glenfield Rd															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	1	1	0	**2**	77	1	0	**78**	239	2	0	**241**	0	0	0	**0**	662	5	1	**668**	5	0	0	**5**	525	13	10	**548**	2	0	0	**2**
7:15 to 8:15	0	1	0	**1**	86	1	0	**87**	261	1	1	**263**	0	0	0	**0**	535	4	1	**540**	2	0	0	**2**	582	16	6	**604**	1	0	0	**1**
7:30 to 8:30	0	1	0	**1**	94	1	0	**95**	284	2	1	**287**	0	0	0	**0**	425	4	1	**430**	1	0	0	**1**	590	16	5	**611**	0	0	0	**0**
7:45 to 8:45	0	1	0	**1**	98	0	0	**98**	272	3	1	**276**	0	0	0	**0**	375	2	0	**377**	0	0	0	**0**	589	17	6	**612**	0	0	0	**0**
8:00 to 9:00	0	0	0	**0**	95	0	0	**95**	239	2	1	**242**	0	0	0	**0**	314	0	0	**314**	0	0	0	**0**	545	15	5	**565**	0	0	0	**0**
AM Totals	**1**	**1**	**0**	**2**	**172**	**1**	**0**	**173**	**478**	**4**	**1**	**483**	**0**	**0**	**0**	**0**	**976**	**5**	**1**	**982**	**5**	**0**	**0**	**5**	**1,070**	**28**	**15**	**1,113**	**2**	**0**	**0**	**2**
16:00 to 17:00	0	0	0	**0**	42	0	0	**42**	211	1	1	**213**	0	0	0	**0**	94	1	0	**95**	0	0	0	**0**	566	14	7	**587**	0	0	0	**0**
16:15 to 17:15	0	0	0	**0**	37	0	0	**37**	251	3	1	**255**	0	0	0	**0**	106	1	0	**107**	1	0	0	**1**	546	12	8	**566**	0	0	0	**0**
16:30 to 17:30	0	0	0	**0**	35	0	0	**35**	287	3	0	**290**	0	0	0	**0**	124	1	0	**125**	1	0	0	**1**	541	12	8	**561**	0	0	0	**0**
16:45 to 17:45	0	0	0	**0**	35	0	0	**35**	343	2	0	**345**	0	0	0	**0**	143	0	0	**143**	1	0	0	**1**	513	12	7	**532**	0	0	0	**0**
17:00 to 18:00	0	0	0	**0**	33	0	0	**33**	408	2	0	**410**	0	0	0	**0**	170	0	0	**170**	1	0	0	**1**	504	8	9	**521**	0	0	0	**0**
PM Totals	**0**	**0**	**0**	**0**	**75**	**0**	**0**	**75**	**619**	**3**	**1**	**623**	**0**	**0**	**0**	**0**	**264**	**1**	**0**	**265**	**1**	**0**	**0**	**1**	**1,070**	**22**	**16**	**1,108**	**0**	**0**	**0**	**0**

Approach	Glenfield Rd																SW Railway Access															
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	405	17	9	**431**	48	0	0	**48**	12	0	0	**12**	0	0	0	**0**	15	2	0	**17**	2	0	0	**2**	4	0	0	**4**	0	0	0	**0**
7:15 to 8:15	418	13	9	**440**	56	1	0	**57**	10	0	0	**10**	0	0	0	**0**	14	2	0	**16**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**
7:30 to 8:30	413	11	9	**433**	72	2	0	**74**	12	0	0	**12**	0	0	0	**0**	13	0	0	**13**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**
7:45 to 8:45	411	9	8	**428**	92	2	0	**94**	14	0	0	**14**	0	0	0	**0**	10	0	0	**10**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**
8:00 to 9:00	402	7	8	**417**	85	2	0	**87**	11	0	0	**11**	1	0	0	**1**	8	0	0	**8**	2	1	0	**3**	4	0	0	**4**	0	0	0	**0**
AM Totals	**807**	**24**	**17**	**848**	**133**	**2**	**0**	**135**	**23**	**0**	**0**	**23**	**1**	**0**	**0**	**1**	**23**	**2**	**0**	**25**	**4**	**1**	**0**	**5**	**8**	**0**	**0**	**8**	**0**	**0**	**0**	**0**
16:00 to 17:00	545	10	7	**562**	11	0	0	**11**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	13	0	0	**13**	0	0	0	**0**	0	0	0	**0**
16:15 to 17:15	535	12	8	**555**	12	1	0	**13**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	9	0	0	**9**	2	0	0	**2**	0	0	0	**0**
16:30 to 17:30	540	14	7	**561**	12	1	0	**13**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	9	0	0	**9**	2	0	0	**2**	0	0	0	**0**
16:45 to 17:45	550	12	8	**570**	12	1	0	**13**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	5	0	0	**5**	2	0	0	**2**	0	0	0	**0**
17:00 to 18:00	565	10	9	**584**	15	1	0	**16**	1	0	0	**1**	0	0	0	**0**	6	0	0	**6**	8	0	0	**8**	2	0	0	**2**	0	0	0	**0**
PM Totals	**1,110**	**20**	**16**	**1,146**	**26**	**1**	**0**	**27**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**10**	**21**	**0**	**0**	**21**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**

Table 1.6 Glenfield Road & Brampton Avenue & Old Glenfield Road

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Glenfield Rd/Old Glenfield Rd/Brampton Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



SKYHIGH - THE TRAFFIC SURVEY COMPANY

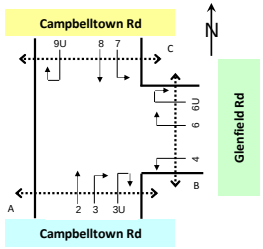
Approach	Brampton Ave																Glenfield Rd											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	127	2	0	**129**	0	0	0	**0**	107	1	0	**108**	0	0	0	**0**	29	0	0	**29**	566	10	11	**587**	2	0	0	**2**	0	0	0	**0**
7:15 to 8:15	139	2	0	**141**	0	0	0	**0**	107	1	0	**108**	0	0	0	**0**	32	0	0	**32**	582	9	9	**600**	1	0	0	**1**	0	0	0	**0**
7:30 to 8:30	135	3	0	**138**	0	0	0	**0**	107	0	0	**107**	0	0	0	**0**	32	0	0	**32**	569	10	7	**586**	1	0	0	**1**	0	0	0	**0**
7:45 to 8:45	123	4	0	**127**	0	0	0	**0**	93	0	0	**93**	0	0	0	**0**	27	0	0	**27**	581	9	7	**597**	1	0	0	**1**	0	0	0	**0**
8:00 to 9:00	111	4	0	**115**	0	0	0	**0**	77	0	0	**77**	0	0	0	**0**	23	0	0	**23**	524	12	5	**541**	1	0	0	**1**	0	0	0	**0**
AM Totals	**238**	**6**	**0**	**244**	**0**	**0**	**0**	**0**	**184**	**1**	**0**	**185**	**0**	**0**	**0**	**0**	**52**	**0**	**0**	**52**	**1,090**	**22**	**16**	**1,128**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
16:00 to 17:00	55	2	0	**57**	0	0	0	**0**	22	0	0	**22**	0	0	0	**0**	24	0	0	**24**	594	12	8	**614**	0	0	0	**0**	0	0	0	**0**
16:15 to 17:15	53	0	0	**53**	0	0	0	**0**	21	0	0	**21**	0	0	0	**0**	31	0	0	**31**	615	23	9	**647**	0	0	0	**0**	0	0	0	**0**
16:30 to 17:30	57	0	0	**57**	0	0	0	**0**	28	0	0	**28**	0	0	0	**0**	36	0	0	**36**	671	28	9	**708**	0	0	0	**0**	0	0	0	**0**
16:45 to 17:45	51	0	0	**51**	0	0	0	**0**	30	0	0	**30**	0	0	0	**0**	54	0	0	**54**	671	28	10	**709**	0	0	0	**0**	0	0	0	**0**
17:00 to 18:00	45	0	0	**45**	0	0	0	**0**	36	0	0	**36**	0	0	0	**0**	63	0	0	**63**	704	24	9	**737**	3	0	0	**3**	0	0	0	**0**
PM Totals	**100**	**2**	**0**	**102**	**0**	**0**	**0**	**0**	**58**	**0**	**0**	**58**	**0**	**0**	**0**	**0**	**87**	**0**	**0**	**87**	**1,298**	**36**	**17**	**1,351**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**

Approach	Old Glenfield Rd																Glenfield Rd											
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	2	1	0	**3**	844	16	10	**870**	32	4	0	**36**	0	0	0	**0**
7:15 to 8:15	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	2	1	0	**3**	782	17	9	**808**	25	3	0	**28**	0	0	0	**0**
7:30 to 8:30	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	688	13	8	**709**	22	2	0	**24**	0	0	0	**0**
7:45 to 8:45	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	3	0	0	**3**	646	10	5	**661**	26	4	0	**30**	0	0	0	**0**
8:00 to 9:00	1	0	0	**1**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	571	9	5	**585**	32	2	0	**34**	0	0	0	**0**
AM Totals	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**6**	**1,415**	**25**	**15**	**1,455**	**64**	**6**	**0**	**70**	**0**	**0**	**0**	**0**
16:00 to 17:00	2	0	0	**2**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**	6	0	0	**6**	517	12	11	**540**	86	1	0	**87**	0	0	0	**0**
16:15 to 17:15	2	0	0	**2**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**	5	0	0	**5**	548	14	11	**573**	77	1	0	**78**	1	0	0	**1**
16:30 to 17:30	2	0	0	**2**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**	4	0	0	**4**	538	11	12	**561**	80	1	0	**81**	1	0	0	**1**
16:45 to 17:45	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	6	0	0	**6**	536	8	11	**555**	100	1	0	**101**	1	0	0	**1**
17:00 to 18:00	1	0	0	**1**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	536	6	8	**550**	109	1	0	**110**	1	0	0	**1**
PM Totals	**3**	**0**	**0**	**3**	**1**	**0**	**0**	**1**	**5**	**1**	**0**	**6**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**11**	**1,053**	**18**	**19**	**1,090**	**195**	**2**	**0**	**197**	**1**	**0**	**0**	**1**

Table 1.7 Campbelltown Road & Glenfield Road

Job No. : N1284
Client : ARC
Suburb : Glenfield
Location : Campbelltown Rd/Glenfield Rd

Day/Date : Thursday, 12th Dec 2013
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Campbelltown Rd												Glenfield Rd											
Direction	Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	728	37	3	**768**	127	3	1	**131**	2	0	0	**2**	67	6	0	**73**	595	8	10	**613**	0	0	0	**0**
7:15 to 8:15	675	41	5	**721**	107	3	1	**111**	2	0	0	**2**	64	4	0	**68**	645	9	8	**662**	0	0	0	**0**
7:30 to 8:30	551	41	7	**599**	98	2	0	**100**	2	0	0	**2**	59	2	0	**61**	628	12	5	**645**	0	0	0	**0**
7:45 to 8:45	473	34	6	**513**	94	5	0	**99**	0	0	0	**0**	64	3	0	**67**	619	11	6	**636**	0	0	0	**0**
8:00 to 9:00	418	33	4	**455**	89	4	0	**93**	0	0	0	**0**	66	2	0	**68**	568	14	5	**587**	0	0	0	**0**
AM Totals	**1,146**	**70**	**7**	**1,223**	**216**	**7**	**1**	**224**	**2**	**0**	**0**	**2**	**133**	**8**	**0**	**141**	**1,163**	**22**	**15**	**1,200**	**0**	**0**	**0**	**0**
16:00 to 17:00	356	19	0	**375**	79	0	1	**80**	1	0	0	**1**	130	2	0	**132**	526	9	8	**543**	0	0	0	**0**
16:15 to 17:15	321	15	0	**336**	74	0	1	**75**	1	0	0	**1**	123	4	0	**127**	549	17	8	**574**	0	0	0	**0**
16:30 to 17:30	333	14	0	**347**	81	0	1	**82**	1	0	0	**1**	115	4	0	**119**	610	22	9	**641**	0	0	0	**0**
16:45 to 17:45	323	17	0	**340**	85	0	0	**85**	0	0	0	**0**	118	4	0	**122**	590	21	10	**621**	0	0	0	**0**
17:00 to 18:00	303	15	0	**318**	78	0	0	**78**	0	0	0	**0**	122	4	0	**126**	626	17	9	**652**	0	0	0	**0**
PM Totals	**659**	**34**	**0**	**693**	**157**	**0**	**1**	**158**	**1**	**0**	**0**	**1**	**252**	**6**	**0**	**258**	**1,152**	**26**	**17**	**1,195**	**0**	**0**	**0**	**0**

Approach	Campbelltown Rd											
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	727	20	8	**755**	725	85	1	**811**	1	0	0	**1**
7:15 to 8:15	650	17	6	**673**	778	79	1	**858**	0	0	0	**0**
7:30 to 8:30	605	14	7	**626**	803	93	0	**896**	0	0	0	**0**
7:45 to 8:45	567	10	6	**583**	798	89	0	**887**	0	0	0	**0**
8:00 to 9:00	525	7	5	**537**	823	89	1	**913**	0	0	0	**0**
AM Totals	**1,252**	**27**	**13**	**1,292**	**1,548**	**174**	**2**	**1,724**	**1**	**0**	**0**	**1**
16:00 to 17:00	533	12	14	**559**	1,556	79	2	**1,637**	1	0	0	**1**
16:15 to 17:15	567	12	13	**592**	1,593	76	2	**1,671**	0	0	0	**0**
16:30 to 17:30	537	15	11	**563**	1,646	68	2	**1,716**	1	0	0	**1**
16:45 to 17:45	571	11	7	**589**	1,687	62	1	**1,750**	1	0	0	**1**
17:00 to 18:00	576	7	8	**591**	1,655	55	1	**1,711**	1	0	0	**1**
PM Totals	**1,109**	**19**	**22**	**1,150**	**3,211**	**134**	**3**	**3,348**	**2**	**0**	**0**	**2**

Table 2.1 Cambridge Avenue Average Daily Traffic Two-Way

Job No	N1284
Client	ARC
Road	Cambridge Avenue 100m west of GWS Road 1
Location	Glenfield
Site No.	2
Start Date	12-Dec-13
Description	Volume Summary
Direction	Combined

Average Weekday	17,225
7 Day Average	15,421

	Day of Week								
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave	7 Day
Time	16-Dec	17-Dec	18-Dec	12-Dec	13-Dec	14-Dec	15-Dec	W'day	Ave
AM Peak	1423	1465	1426	1511	1461	731	591		
PM Peak	1569	1483	1523	1614	1483	812	680		
0:00	128	139	127	148	141	252	270	137	172
1:00	70	89	75	94	103	140	142	86	102
2:00	56	74	94	81	86	119	93	78	86
3:00	85	106	107	114	119	138	96	106	109
4:00	227	234	233	244	232	176	114	234	209
5:00	796	838	882	866	852	365	187	847	684
6:00	1423	1465	1426	1511	1461	478	233	1457	1142
7:00	1362	1400	1322	1479	1360	466	220	1385	1087
8:00	1178	1168	1135	1174	1152	566	347	1161	960
9:00	730	707	682	669	723	693	477	702	669
10:00	613	593	599	587	580	731	528	594	604
11:00	548	545	566	501	586	683	591	549	574
12:00	650	636	608	581	678	765	680	631	657
13:00	783	750	706	673	793	800	643	741	735
14:00	950	956	877	914	1005	812	679	940	885
15:00	1337	1321	1216	1330	1295	766	644	1300	1130
16:00	1480	1440	1428	1534	1402	806	636	1457	1247
17:00	1569	1483	1523	1614	1483	745	624	1534	1292
18:00	1138	1110	990	1123	1128	708	580	1098	968
19:00	601	597	595	602	577	468	506	594	564
20:00	584	426	499	480	464	368	437	491	465
21:00	482	399	442	473	465	361	442	452	438
22:00	373	305	394	375	442	378	323	378	370
23:00	273	240	252	263	333	349	200	272	273
Total	17433	17022	16778	17430	17460	12133	9692	17225	15421
7-19	12336	12109	11652	12179	12185	8541	6649	12092	10807
6-22	15426	14996	14614	15245	15152	10216	8267	15087	13417
6-24	16071	15541	15260	15883	15927	10943	8790	15736	14059
0-24	17433	17022	16778	17430	17460	12133	9692	17225	15421

Table 2.2 Cambridge Avenue Average Daily Traffic Eastbound

Job No	N1284
Client	ARC
Road	Cambridge Avenue 100m west of GWS Road 1
Location	Glenfield
Site No.	2
Start Date	12-Dec-13
Description	Volume Summary
Direction	EB

Average Weekday	8,670
7 Day Average	7,743

Time	Day of Week							Ave W'day	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	16-Dec	17-Dec	18-Dec	12-Dec	13-Dec	14-Dec	15-Dec		
AM Peak	1274	1294	1231	1323	1285	443	359		
PM Peak	429	428	355	427	428	353	340		
0:00	33	30	25	32	26	76	63	29	41
1:00	27	35	27	39	39	50	46	33	38
2:00	29	38	44	44	42	66	41	39	43
3:00	64	72	78	81	72	65	42	73	68
4:00	199	199	195	205	193	106	66	198	166
5:00	750	781	823	809	783	303	129	789	625
6:00	1274	1294	1231	1323	1285	382	159	1281	993
7:00	1157	1174	1129	1230	1134	328	135	1165	898
8:00	885	867	821	864	853	380	239	858	701
9:00	486	470	439	459	465	443	329	464	442
10:00	356	345	373	356	322	408	345	350	358
11:00	307	299	328	271	319	370	359	305	322
12:00	321	314	289	291	329	353	340	309	319
13:00	354	329	352	317	316	349	319	334	334
14:00	341	354	314	366	356	341	316	346	341
15:00	429	428	355	427	428	323	277	413	381
16:00	339	294	316	326	341	318	269	323	315
17:00	359	306	294	323	366	346	259	330	322
18:00	305	278	237	276	328	309	252	285	284
19:00	238	187	207	213	254	225	217	220	220
20:00	190	154	185	189	188	167	205	181	183
21:00	177	144	151	169	176	147	182	163	164
22:00	116	95	102	120	141	152	103	115	118
23:00	65	56	65	61	85	103	50	66	69
Total	8798	8543	8380	8791	8841	6110	4742	8670	7743
7-19	5637	5457	5247	5506	5557	4268	3439	5481	5016
6-22	7515	7236	7021	7400	7460	5189	4202	7326	6575
6-24	7696	7387	7188	7581	7686	5444	4355	7508	6762
0-24	8798	8543	8380	8791	8841	6110	4742	8670	7743

Table 2.3 Cambridge Avenue Average Daily Traffic Westbound

Job No	N1284
Client	ARC
Road	Cambridge Avenue 100m west of GWS Road 1
Location	Glenfield
Site No.	2
Start Date	12-Dec-13
Description	Volume Summary
Direction	WB

Average Weekday	8,554
7 Day Average	7,678

	Day of Week							Ave	7 Day
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	W'day	Ave
Time	16-Dec	17-Dec	18-Dec	12-Dec	13-Dec	14-Dec	15-Dec		
AM Peak	293	301	314	310	299	323	232		
PM Peak	1211	1177	1229	1291	1117	488	367		
0:00	95	109	102	116	115	176	207	107	131
1:00	43	54	48	55	64	90	96	53	64
2:00	27	36	50	37	44	53	52	39	43
3:00	21	34	29	33	47	73	54	33	42
4:00	28	35	38	39	39	70	48	36	42
5:00	46	57	59	57	69	62	58	58	58
6:00	149	171	195	188	176	96	74	176	150
7:00	205	227	193	249	226	138	85	220	189
8:00	293	301	314	310	299	186	108	303	259
9:00	244	237	243	210	258	250	148	238	227
10:00	257	249	226	231	258	323	183	244	247
11:00	241	246	238	230	267	313	232	244	252
12:00	330	323	319	290	349	412	340	322	337
13:00	429	421	354	356	477	451	324	407	402
14:00	609	602	563	548	649	471	363	594	544
15:00	908	893	861	903	867	443	367	886	749
16:00	1142	1146	1112	1208	1061	488	367	1134	932
17:00	1211	1177	1229	1291	1117	399	365	1205	970
18:00	833	832	753	847	800	399	328	813	685
19:00	364	410	388	389	323	243	289	375	344
20:00	394	272	314	291	276	201	232	309	283
21:00	305	255	291	304	289	214	260	289	274
22:00	257	210	292	255	301	226	220	263	252
23:00	209	184	187	202	248	246	150	206	204
Total	8636	8479	8398	8639	8619	6023	4950	8554	7678
7-19	6700	6652	6405	6673	6628	4273	3210	6612	5792
6-22	7911	7760	7593	7845	7692	5027	4065	7760	6842
6-24	8376	8154	8072	8302	8241	5499	4435	8229	7297
0-24	8636	8479	8398	8639	8619	6023	4950	8554	7678

Table 2.4 Cambridge Avenue Vehicle Class Summary

Road Cambridge Avenue 100m west of GWS Road 1
Location Glenfield
Site No. 2
Start Date 12-Dec-13
Day Weekday Ave.
Description Class Summary

M'Cycle & P'Cycle	1%
Cars	95%
LGV	3%
OGV1 & PSV	1%
OGV2	0%

	EB						WB						Combined					
	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total
0:00	0	28	1	0	0	29	1	104	3	0	0	107	1	131	3	1	0	137
1:00	0	33	0	0	0	33	1	50	1	1	0	53	1	83	1	1	0	86
2:00	0	38	0	1	0	39	0	37	1	0	0	39	0	75	1	2	0	78
3:00	1	69	3	0	1	73	0	32	0	1	0	33	1	101	4	1	1	106
4:00	1	185	8	2	2	198	1	33	2	0	0	36	2	218	10	2	2	234
5:00	2	742	40	4	2	789	1	54	2	0	1	58	3	796	42	4	3	847
6:00	6	1200	60	12	4	1281	2	167	5	2	0	176	8	1366	65	14	4	1457
7:00	3	1115	38	6	3	1165	1	208	8	3	0	220	4	1323	46	8	3	1385
8:00	2	823	24	8	2	858	2	287	11	3	0	303	3	1110	35	11	3	1161
9:00	3	434	18	5	4	464	2	223	10	4	0	238	5	657	28	9	4	702
10:00	1	322	18	4	4	350	1	218	18	6	2	244	2	540	36	10	6	594
11:00	0	281	15	6	3	305	3	223	15	3	1	244	3	504	29	9	4	549
12:00	0	294	11	2	2	309	3	302	12	3	2	322	3	596	23	5	4	631
13:00	1	314	16	2	1	334	3	380	20	4	2	407	4	694	35	6	2	741
14:00	1	322	20	3	0	346	6	554	25	4	5	594	7	876	44	7	6	940
15:00	1	398	11	2	1	413	15	832	30	4	4	886	16	1231	42	6	5	1300
16:00	1	313	9	1	0	323	11	1079	31	8	5	1134	12	1392	39	9	5	1457
17:00	0	319	9	1	0	330	9	1143	37	11	4	1205	10	1463	47	11	5	1534
18:00	1	276	8	0	1	285	5	785	21	1	2	813	5	1061	28	1	3	1098
19:00	1	213	6	0	0	220	0	363	11	0	0	375	1	576	17	0	0	594
20:00	0	178	3	0	0	181	1	302	6	0	0	309	1	480	9	0	0	491
21:00	0	160	3	0	0	163	0	286	2	0	0	289	0	446	5	0	1	452
22:00	0	113	2	0	0	115	4	257	2	0	0	263	4	370	4	0	0	378
23:00	0	65	1	0	0	66	3	202	2	0	0	206	3	267	3	0	0	272
Total	24	8234	323	59	31	8670	75	8119	273	57	30	8554	99	16352	597	116	61	17225

Table 2.5 Skyhigh Traffic Vehicle Classification Scheme

Level 1	Level 2		Level 3	ARX			
Length	Axles and Groups		Vehicle Type	Classification			
Type	Axles	Groups	Description	Class		Parameters	Spreadsheet Classification
Short	Light Vehicles						
up to 5.5m	2	1 or 2	Very Short Bicycle or Motorcycle	MC	1	d(1) < 1.7m and axles = 2	M'Cycles
	2	1 or 2	Short Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc.	SV	2	d(1) >= 1.7m, d(1) <= 3.2m and axles = 2	Cars
Medium 5.5m to 14.5m	3, 4 or 5	3	Short - Towing Trailer, Caravan, Boat, etc.	SVT	3	groups = 3, d(1) >= 2.1m, d(1) <= 3.2m, d(2) >= 2.1m and axles = 3,4,5	
	Heavy Vehicles						
	2	2	Two Axle Truck or Bus	TB2	4	d(1) > 3.2m and axles = 2	LGV
	3	2	Three Axle Truck or Bus	TB3	5	axles = 3 and groups = 2	OGV & PSV
	> 3	2	Four Axle Truck	T4	6	axles > 3 and groups = 2	
Long 11.5m to 19.0m	3	3	Three Axle Articulated Three axle articulated vehicle or Rigid vehicle and trailer	ART3	7	d(1) > 3.2m, axles = 3 and groups = 3	OGV2
	4	> 2	Four Axle Articulated Four axle articulated vehicle or Rigid vehicle and trailer	ART4	8	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2	
	5	> 2	Five Axle Articulated Five axle articulated vehicle or Rigid vehicle and trailer	ART5	9	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2	
	>= 6	> 2	Six Axle Articulated Six (or more) axle articulated vehicle or Rigid vehicle and trailer	ART6	10	axles = 6 and groups > 2 or axles > 6 and groups = 3	
Medium and Long Combination	> 6	4	B Double B Double or Heavy truck and trailer	BD	11	groups = 4 and axles > 6	
Over 17.5m	> 6	>=5	Double or Triple Road Train Double road train or Heavy truck and two trailers	DRT	12	groups = 5 or 6 and axles > 6	

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B1

Intersection Cambridge Avenue & Moorebank Avenue

SIDRA Report

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Table B1.1.1 AM 2014

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave AM 2014

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	11	27.3	0.031	5.9	LOS A	0.0	0.0	0.00	0.12	56.1
2	T1	42	14.3	0.031	0.0	LOS A	0.0	0.0	0.00	0.12	59.0
Approach		53	17.0	0.031	1.2	NA	0.0	0.0	0.00	0.12	58.4
North: Moorebank Avenue											
8	T1	163	8.0	0.088	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	246	3.3	0.145	5.7	LOS A	0.7	4.9	0.16	0.55	52.8
Approach		409	5.1	0.145	3.5	NA	0.7	4.9	0.10	0.33	55.4
West: Cambridge Avenue											
10	L2	1174	3.3	0.755	6.1	LOS A	9.0	60.6	0.33	0.51	52.5
12	R2	88	2.3	0.128	8.9	LOS A	0.5	3.4	0.54	0.75	50.5
Approach		1262	3.2	0.755	6.3	LOS A	9.0	60.6	0.34	0.53	52.3
All Vehicles		1724	4.1	0.755	5.4	NA	9.0	60.6	0.27	0.47	53.2

Table B1.1.2 AM 2024

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave AM 2024

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	11	27.3	0.032	5.9	LOS A	0.0	0.0	0.00	0.12	56.2
2	T1	44	13.6	0.032	0.0	LOS A	0.0	0.0	0.00	0.12	59.1
Approach		55	16.4	0.032	1.2	NA	0.0	0.0	0.00	0.12	58.5
North: Moorebank Avenue											
8	T1	172	8.1	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	265	3.0	0.157	5.7	LOS A	0.8	5.3	0.17	0.55	52.8
Approach		437	5.0	0.157	3.5	NA	0.8	5.3	0.10	0.33	55.4
West: Cambridge Avenue											
10	L2	1290	3.2	0.850	6.3	LOS A	13.4	90.0	0.43	0.50	52.2
12	R2	92	2.2	0.139	9.2	LOS A	0.6	3.7	0.55	0.77	50.3
Approach		1382	3.1	0.850	6.5	LOS A	13.4	90.0	0.44	0.52	52.0
All Vehicles		1874	3.9	0.850	5.6	NA	13.4	90.0	0.35	0.46	52.9

Table B1.1.3 AM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave AM 2024 + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	11	27.3	0.032	5.9	LOS A	0.0	0.0	0.00	0.12	56.2
2	T1	44	13.6	0.032	0.0	LOS A	0.0	0.0	0.00	0.12	59.1
Approach		55	16.4	0.032	1.2	NA	0.0	0.0	0.00	0.12	58.5
North: Moorebank Avenue											
8	T1	172	8.1	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	328	4.6	0.196	5.8	LOS A	1.0	7.0	0.17	0.55	52.7
Approach		500	5.8	0.196	3.8	NA	1.0	7.0	0.11	0.36	55.0
West: Cambridge Avenue											
10	L2	1311	3.7	0.874	6.4	LOS A	14.8	99.5	0.46	0.49	52.0
12	R2	92	2.2	0.153	10.0	LOS A	0.6	4.0	0.58	0.81	49.8
Approach		1403	3.6	0.874	6.6	LOS A	14.8	99.5	0.47	0.51	51.9
All Vehicles		1958	4.5	0.874	5.7	NA	14.8	99.5	0.36	0.46	52.8

Table B1.1.4 AM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave AM 2024 + SSD

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	11	27.3	0.032	5.9	LOS A	0.0	0.0	0.00	0.12	56.2
2	T1	44	13.6	0.032	0.0	LOS A	0.0	0.0	0.00	0.12	59.1
Approach		55	16.4	0.032	1.2	NA	0.0	0.0	0.00	0.12	58.5
North: Moorebank Avenue											
8	T1	172	8.1	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	272	4.0	0.162	5.8	LOS A	0.8	5.6	0.17	0.55	52.7
Approach		444	5.6	0.162	3.5	NA	0.8	5.6	0.10	0.34	55.3
West: Cambridge Avenue											
10	L2	1292	3.4	0.853	6.3	LOS A	13.6	91.4	0.43	0.50	52.1
12	R2	92	2.2	0.141	9.3	LOS A	0.6	3.8	0.56	0.78	50.2
Approach		1384	3.3	0.853	6.5	LOS A	13.6	91.4	0.44	0.52	52.0
All Vehicles		1883	4.2	0.853	5.6	NA	13.6	91.4	0.35	0.46	52.9

Table B1.1.5 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave AM 2024 + SSD + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	11	27.3	0.032	5.9	LOS A	0.0	0.0	0.00	0.12	56.2
2	T1	44	13.6	0.032	0.0	LOS A	0.0	0.0	0.00	0.12	59.1
Approach		55	16.4	0.032	1.2	NA	0.0	0.0	0.00	0.12	58.5
North: Moorebank Avenue											
8	T1	172	8.1	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	334	5.4	0.200	5.8	LOS A	1.1	7.3	0.17	0.55	52.7
Approach		506	6.3	0.200	3.8	NA	1.1	7.3	0.11	0.36	54.9
West: Cambridge Avenue											
10	L2	1312	3.8	0.876	6.4	LOS A	14.9	100.5	0.46	0.49	52.0
12	R2	92	2.2	0.154	10.1	LOS A	0.6	4.1	0.59	0.81	49.7
Approach		1404	3.7	0.876	6.6	LOS A	14.9	100.5	0.47	0.51	51.9
All Vehicles		1965	4.7	0.876	5.7	NA	14.9	100.5	0.37	0.46	52.8

Table B1.2.1 PM 2014

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave PM 2014

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	37	18.9	0.061	5.8	LOS A	0.0	0.0	0.00	0.21	55.8
2	T1	68	14.7	0.061	0.0	LOS A	0.0	0.0	0.00	0.21	58.2
Approach		105	16.2	0.061	2.0	NA	0.0	0.0	0.00	0.21	57.3
North: Moorebank Avenue											
8	T1	21	19.0	0.012	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	1155	2.6	0.713	7.1	LOS A	10.0	66.8	0.47	0.58	51.9
Approach		1176	2.9	0.713	7.0	NA	10.0	66.8	0.46	0.57	52.0
West: Cambridge Avenue											
10	L2	336	1.5	0.219	5.8	LOS A	1.0	6.9	0.18	0.55	53.0
12	R2	2	50.0	0.030	58.2	LOS E	0.1	0.8	0.94	0.98	29.4
Approach		338	1.8	0.219	6.1	LOS A	1.0	6.9	0.19	0.55	52.7
All Vehicles		1619	3.5	0.713	6.5	NA	10.0	66.8	0.37	0.54	52.5

Table B1.2.2 PM 2024

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave PM 2024

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	39	17.9	0.064	5.8	LOS A	0.0	0.0	0.00	0.21	55.8
2	T1	72	15.3	0.064	0.0	LOS A	0.0	0.0	0.00	0.21	58.2
Approach		111	16.2	0.064	2.0	NA	0.0	0.0	0.00	0.21	57.3
North: Moorebank Avenue											
8	T1	22	18.2	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	1304	2.5	0.809	8.7	LOS A	19.8	131.9	0.59	0.62	50.9
Approach		1326	2.7	0.809	8.5	NA	19.8	131.9	0.58	0.61	51.1
West: Cambridge Avenue											
10	L2	358	1.4	0.234	5.8	LOS A	1.1	7.4	0.19	0.55	53.0
12	R2	2	50.0	0.053	95.2	LOS F	0.1	1.4	0.97	0.99	22.6
Approach		360	1.7	0.234	6.3	LOS A	1.1	7.4	0.20	0.55	52.6
All Vehicles		1797	3.3	0.809	7.7	NA	19.8	131.9	0.47	0.57	51.7

Table B1.2.3 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave PM 2024 + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	39	17.9	0.064	5.8	LOS A	0.0	0.0	0.00	0.21	55.8
2	T1	72	15.3	0.064	0.0	LOS A	0.0	0.0	0.00	0.21	58.2
Approach		111	16.2	0.064	2.0	NA	0.0	0.0	0.00	0.21	57.3
North: Moorebank Avenue											
8	T1	22	18.2	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	1324	2.9	0.823	9.0	LOS A	21.9	146.3	0.61	0.63	50.7
Approach		1346	3.1	0.823	8.9	NA	21.9	146.3	0.60	0.62	50.8
West: Cambridge Avenue											
10	L2	423	2.8	0.278	5.9	LOS A	1.4	9.4	0.20	0.55	52.9
12	R2	2	50.0	0.058	103.4	LOS F	0.2	1.5	0.97	0.99	21.6
Approach		425	3.1	0.278	6.3	LOS A	1.4	9.4	0.21	0.55	52.5
All Vehicles		1882	3.9	0.823	7.9	NA	21.9	146.3	0.47	0.58	51.5

Table B1.2.4 PM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave PM 2024 + SSD

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	39	17.9	0.064	5.8	LOS A	0.0	0.0	0.00	0.21	55.8
2	T1	72	15.3	0.064	0.0	LOS A	0.0	0.0	0.00	0.21	58.2
Approach		111	16.2	0.064	2.0	NA	0.0	0.0	0.00	0.21	57.3
North: Moorebank Avenue											
8	T1	22	18.2	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	1303	2.4	0.808	8.7	LOS A	19.7	130.9	0.58	0.62	51.0
Approach		1325	2.6	0.808	8.5	NA	19.7	130.9	0.57	0.61	51.1
West: Cambridge Avenue											
10	L2	364	1.4	0.238	5.8	LOS A	1.1	7.6	0.19	0.55	53.0
12	R2	2	50.0	0.053	94.7	LOS F	0.1	1.4	0.97	0.99	22.7
Approach		366	1.6	0.238	6.3	LOS A	1.1	7.6	0.20	0.55	52.6
All Vehicles		1802	3.3	0.808	7.7	NA	19.7	130.9	0.46	0.57	51.7

Table B1.2.5 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Moorebank Ave PM 2024 + SSD + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Moorebank Avenue											
1	L2	39	17.9	0.064	5.8	LOS A	0.0	0.0	0.00	0.21	55.8
2	T1	72	15.3	0.064	0.0	LOS A	0.0	0.0	0.00	0.21	58.2
Approach		111	16.2	0.064	2.0	NA	0.0	0.0	0.00	0.21	57.3
North: Moorebank Avenue											
8	T1	22	18.2	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	1324	2.9	0.823	9.0	LOS A	21.9	146.3	0.61	0.63	50.7
Approach		1346	3.1	0.823	8.9	NA	21.9	146.3	0.60	0.62	50.8
West: Cambridge Avenue											
10	L2	429	2.8	0.282	5.9	LOS A	1.4	9.6	0.20	0.55	52.9
12	R2	2	50.0	0.058	103.4	LOS F	0.2	1.5	0.97	0.99	21.6
Approach		431	3.0	0.282	6.3	LOS A	1.4	9.6	0.21	0.55	52.5
All Vehicles		1888	3.9	0.823	7.9	NA	21.9	146.3	0.47	0.58	51.5

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B2

Intersection Cambridge Avenue & GWS Road 1

SIDRA Report

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Table B2.1.1 AM 2014

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 AM 2014

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	245	2.9	0.128	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	5	80.0	0.035	31.1	LOS C	0.1	1.2	0.91	0.96	24.5
Approach		250	4.4	0.128	0.6	NA	0.1	1.2	0.02	0.02	58.3
North: GWS Road 1											
7	L2	6	66.7	0.051	28.4	LOS B	0.1	1.6	0.92	0.92	23.4
9	R2	7	85.7	0.158	77.4	LOS F	0.4	5.0	0.96	0.98	17.7
Approach		13	76.9	0.158	54.8	LOS D	0.4	5.0	0.94	0.95	19.9
West: Cambridge Avenue											
10	L2	5	60.0	0.004	6.3	LOS A	0.0	0.0	0.00	0.57	51.1
11	T1	1256	2.9	0.656	0.2	LOS A	0.0	0.0	0.00	0.00	59.7
Approach		1261	3.1	0.656	0.2	NA	0.0	0.0	0.00	0.00	59.6
All Vehicles		1524	3.9	0.656	0.7	NA	0.4	5.0	0.01	0.01	58.4

Table B2.1.2 AM 2024

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 AM 2024

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	264	2.7	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	5	80.0	0.054	44.0	LOS D	0.2	1.8	0.94	0.98	22.6
Approach		269	4.1	0.138	0.8	NA	0.2	1.8	0.02	0.02	58.2
North: GWS Road 1											
7	L2	6	66.7	0.082	45.3	LOS D	0.2	2.4	0.95	0.95	21.1
9	R2	7	85.7	0.254	135.7	LOS F	0.7	7.9	0.98	1.01	13.8
Approach		13	76.9	0.254	94.0	LOS F	0.7	7.9	0.97	0.98	16.4
West: Cambridge Avenue											
10	L2	5	60.0	0.004	6.3	LOS A	0.0	0.0	0.00	0.57	51.1
11	T1	1376	2.8	0.718	0.2	LOS A	0.0	0.0	0.00	0.00	59.6
Approach		1381	3.0	0.718	0.2	NA	0.0	0.0	0.00	0.00	59.5
All Vehicles		1663	3.7	0.718	1.1	NA	0.7	7.9	0.01	0.01	58.1

Table B2.1.3 AM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 AM 2024 + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	327	4.3	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	5	80.0	0.059	47.4	LOS D	0.2	2.0	0.95	0.98	22.1
Approach		332	5.4	0.172	0.7	NA	0.2	2.0	0.01	0.01	58.5
North: GWS Road 1											
7	L2	6	66.7	0.091	50.0	LOS D	0.2	2.6	0.96	0.96	20.5
9	R2	7	85.7	0.320	183.1	LOS F	0.8	9.8	0.99	1.03	11.7
Approach		13	76.9	0.320	121.7	LOS F	0.8	9.8	0.97	0.99	14.6
West: Cambridge Avenue											
10	L2	5	60.0	0.004	6.3	LOS A	0.0	0.0	0.00	0.57	51.1
11	T1	1396	3.2	0.731	0.2	LOS A	0.0	0.0	0.00	0.00	59.6
Approach		1401	3.4	0.731	0.3	NA	0.0	0.0	0.00	0.00	59.5
All Vehicles		1746	4.3	0.731	1.2	NA	0.8	9.8	0.01	0.01	58.0

Table B2.1.4 AM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 AM 2024 + SSD

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	264	2.7	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	14	50.0	0.100	31.8	LOS C	0.3	2.9	0.93	0.97	24.4
Approach		278	5.0	0.138	1.6	NA	0.3	2.9	0.05	0.05	55.9
North: GWS Road 1											
7	L2	2	50.0	0.021	34.5	LOS C	0.1	0.6	0.94	0.94	22.6
9	R2	2	50.0	0.044	71.3	LOS F	0.1	1.1	0.96	0.97	18.4
Approach		4	50.0	0.044	52.9	LOS D	0.1	1.1	0.95	0.95	20.3
West: Cambridge Avenue											
10	L2	16	43.8	0.011	6.1	LOS A	0.0	0.0	0.00	0.57	51.8
11	T1	1382	3.2	0.723	0.2	LOS A	0.0	0.0	0.00	0.00	59.6
Approach		1398	3.6	0.723	0.3	NA	0.0	0.0	0.00	0.01	59.5
All Vehicles		1680	4.0	0.723	0.6	NA	0.3	2.9	0.01	0.02	58.6

Table B2.1.5 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 AM 2024 + SSD + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	325	4.3	0.171	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	14	50.0	0.109	33.8	LOS C	0.3	3.1	0.93	0.97	24.0
Approach		339	6.2	0.171	1.4	NA	0.3	3.1	0.04	0.04	56.5
North: GWS Road 1											
7	L2	2	50.0	0.023	37.9	LOS C	0.1	0.6	0.94	0.94	22.1
9	R2	2	50.0	0.054	86.4	LOS F	0.1	1.3	0.97	0.97	17.1
Approach		4	50.0	0.054	62.2	LOS E	0.1	1.3	0.96	0.96	19.3
West: Cambridge Avenue											
10	L2	16	43.8	0.011	6.1	LOS A	0.0	0.0	0.00	0.57	51.8
11	T1	1402	3.6	0.736	0.2	LOS A	0.0	0.0	0.00	0.00	59.5
Approach		1418	4.0	0.736	0.3	NA	0.0	0.0	0.00	0.01	59.4
All Vehicles		1761	4.5	0.736	0.7	NA	0.3	3.1	0.01	0.02	58.6

Table B2.2.1 PM 2014

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 PM 2014

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	1192	3.2	0.624	0.1	LOS A	0.0	0.0	0.00	0.00	59.7
6	R2	1	100.0	0.001	8.2	LOS A	0.0	0.1	0.47	0.54	29.0
Approach		1193	3.3	0.624	0.1	NA	0.0	0.1	0.00	0.00	59.7
North: GWS Road 1											
7	L2	1	100.0	0.001	2.4	LOS A	0.0	0.1	0.45	0.24	28.2
9	R2	9	22.2	0.084	31.7	LOS C	0.2	1.9	0.92	0.93	23.2
Approach		10	30.0	0.084	28.7	LOS C	0.2	1.9	0.88	0.86	23.6
West: Cambridge Avenue											
10	L2	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	341	1.5	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		342	1.5	0.177	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1545	3.0	0.624	0.3	NA	0.2	1.9	0.01	0.01	59.1

Table B2.2.2 PM 2024

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 PM 2024

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	1342	3.0	0.702	0.2	LOS A	0.0	0.0	0.00	0.00	59.6
6	R2	1	100.0	0.001	8.3	LOS A	0.0	0.1	0.48	0.55	28.9
Approach		1343	3.1	0.702	0.2	NA	0.0	0.1	0.00	0.00	59.6
North: GWS Road 1											
7	L2	1	100.0	0.001	2.6	LOS A	0.0	0.1	0.47	0.25	28.2
9	R2	9	22.2	0.132	49.1	LOS D	0.4	2.8	0.95	0.96	20.9
Approach		10	30.0	0.132	44.4	LOS D	0.4	2.8	0.91	0.89	21.4
West: Cambridge Avenue											
10	L2	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	363	1.4	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		364	1.4	0.188	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1717	2.9	0.702	0.4	NA	0.4	2.8	0.01	0.01	59.0

Table B2.2.3 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 PM 2024 + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	1363	3.4	0.715	0.2	LOS A	0.0	0.0	0.00	0.00	59.6
6	R2	1	100.0	0.001	8.9	LOS A	0.0	0.1	0.52	0.56	28.8
Approach		1364	3.5	0.715	0.2	NA	0.0	0.1	0.00	0.00	59.5
North: GWS Road 1											
7	L2	4	0.0	0.004	1.3	LOS A	0.0	0.1	0.42	0.23	29.0
9	R2	9	22.2	0.160	60.9	LOS E	0.4	3.3	0.96	0.97	19.6
Approach		13	15.4	0.160	42.6	LOS D	0.4	3.3	0.80	0.75	21.7
West: Cambridge Avenue											
10	L2	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	428	2.8	0.223	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		429	2.8	0.223	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1806	3.4	0.715	0.5	NA	0.4	3.3	0.01	0.01	58.9

Table B2.2.4 PM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 PM 2024 + SSD

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	1342	3.0	0.702	0.2	LOS A	0.0	0.0	0.00	0.00	59.6
6	R2	1	100.0	0.001	8.4	LOS A	0.0	0.1	0.48	0.55	28.9
Approach		1343	3.1	0.702	0.2	NA	0.0	0.1	0.00	0.00	59.6
North: GWS Road 1											
7	L2	2	0.0	0.002	1.1	LOS A	0.0	0.0	0.39	0.18	29.0
9	R2	4	0.0	0.042	34.3	LOS C	0.1	0.7	0.93	0.94	23.0
Approach		6	0.0	0.042	23.2	LOS B	0.1	0.7	0.75	0.69	24.7
West: Cambridge Avenue											
10	L2	1	100.0	0.001	6.2	LOS A	0.0	0.0	0.00	0.57	51.5
11	T1	369	1.6	0.191	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		370	1.9	0.191	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1719	2.8	0.702	0.2	NA	0.1	0.7	0.00	0.00	59.4

Table B2.2.5 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & GWS Road 1 PM 2024 + SSD + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	1363	3.4	0.715	0.2	LOS A	0.0	0.0	0.00	0.00	59.6
6	R2	1	100.0	0.001	9.0	LOS A	0.0	0.1	0.52	0.56	28.8
Approach		1364	3.5	0.715	0.2	NA	0.0	0.1	0.00	0.00	59.5
North: GWS Road 1											
7	L2	2	0.0	0.002	1.3	LOS A	0.0	0.0	0.42	0.22	29.0
9	R2	4	0.0	0.049	40.6	LOS C	0.1	0.9	0.95	0.95	22.1
Approach		6	0.0	0.049	27.5	LOS B	0.1	0.9	0.77	0.70	24.0
West: Cambridge Avenue											
10	L2	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	433	3.0	0.226	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		434	3.0	0.226	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1804	3.4	0.715	0.3	NA	0.1	0.9	0.00	0.00	59.3

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B3

Intersection Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade

SIDRA Report

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Table B3.1.1 AM 2014

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde AM 2014

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	280	2.5	0.291	4.8	LOS A	1.6	10.5	0.41	0.53	54.6
2	T1	11	9.1	0.291	4.8	LOS A	1.6	10.5	0.41	0.53	56.2
3	R2	854	2.5	0.600	10.1	LOS A	5.0	33.6	0.52	0.64	52.1
Approach		1145	2.5	0.600	8.8	LOS A	5.0	33.6	0.49	0.62	52.7
East: Cambridge Avenue											
4	L2	184	4.9	0.033	4.2	LOS A	0.1	1.0	0.07	0.47	55.4
5	T1	43	4.7	0.055	4.3	LOS A	0.2	1.7	0.34	0.52	55.0
6	R2	24	8.3	0.055	9.9	LOS A	0.2	1.7	0.34	0.52	55.1
Approach		251	5.2	0.078	4.7	LOS A	0.2	1.7	0.14	0.48	55.3
North: Railway Parade											
7	L2	277	5.1	0.468	14.6	LOS B	4.1	28.6	0.98	1.03	48.1
8	T1	10	50.0	0.468	14.8	LOS B	4.1	28.6	0.98	1.03	48.8
9	R2	113	8.0	0.257	19.0	LOS B	1.6	11.2	0.88	0.95	47.3
Approach		400	7.0	0.468	15.9	LOS B	4.1	28.6	0.95	1.01	47.9
West: Glenfield Road											
10	L2	183	5.5	0.284	8.7	LOS A	1.7	11.6	0.78	0.85	52.1
11	T1	130	2.3	0.288	7.7	LOS A	1.9	12.9	0.80	0.81	52.5
12	R2	105	6.7	0.288	13.3	LOS A	1.9	12.9	0.80	0.81	52.5
Approach		418	4.8	0.288	9.6	LOS A	1.9	12.9	0.79	0.83	52.3
All Vehicles		2214	4.1	0.600	9.8	LOS A	5.0	33.6	0.59	0.71	52.0

Table B3.1.2 AM 2024

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde AM 2024

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	339	2.1	0.339	5.0	LOS A	1.9	12.9	0.46	0.57	54.4
2	T1	12	8.3	0.659	5.0	LOS A	6.0	40.1	0.61	0.67	51.6
3	R2	898	2.4	0.659	10.4	LOS A	6.0	40.1	0.61	0.67	51.9
Approach		1249	2.4	0.659	8.9	LOS A	6.0	40.1	0.57	0.64	52.5
East: Cambridge Avenue											
4	L2	193	4.7	0.035	4.2	LOS A	0.2	1.0	0.08	0.47	55.4
5	T1	52	3.8	0.065	4.5	LOS A	0.3	2.0	0.39	0.53	55.0
6	R2	25	8.0	0.065	10.1	LOS A	0.3	2.0	0.39	0.53	55.0
Approach		270	4.8	0.083	4.8	LOS A	0.3	2.0	0.17	0.49	55.3
North: Railway Parade											
7	L2	291	5.2	0.627	29.1	LOS C	7.4	51.1	1.00	1.24	40.4
8	T1	10	50.0	0.627	29.3	LOS C	7.4	51.1	1.00	1.24	40.9
9	R2	135	6.7	0.384	25.7	LOS B	2.8	19.1	0.97	1.03	43.7
Approach		436	6.7	0.627	28.1	LOS B	7.4	51.1	0.99	1.17	41.4
West: Glenfield Road											
10	L2	269	4.1	0.489	13.1	LOS A	3.9	26.6	0.93	1.03	49.1
11	T1	192	1.6	0.494	11.4	LOS A	4.4	29.7	0.96	1.00	50.4
12	R2	153	4.6	0.494	16.9	LOS B	4.4	29.7	0.96	1.00	50.5
Approach		614	3.4	0.494	13.5	LOS A	4.4	29.7	0.94	1.01	49.8
All Vehicles		2569	3.6	0.659	12.8	LOS A	7.4	51.1	0.69	0.80	49.9

Table B3.1.3 AM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde AM 2024 + Rezone

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	339	2.1	0.354	5.3	LOS A	1.9	12.7	0.49	0.60	54.3
2	T1	12	8.3	0.702	5.8	LOS A	6.9	46.1	0.66	0.73	51.4
3	R2	932	2.7	0.702	11.2	LOS A	6.9	46.1	0.66	0.73	51.7
Approach		1283	2.6	0.702	9.6	LOS A	6.9	46.1	0.61	0.70	52.4
East: Cambridge Avenue											
4	L2	205	6.3	0.040	4.2	LOS A	0.2	1.3	0.06	0.47	55.5
5	T1	93	26.9	0.096	4.8	LOS A	0.4	3.5	0.40	0.52	54.7
6	R2	25	8.0	0.096	10.2	LOS A	0.4	3.5	0.41	0.52	55.0
Approach		323	12.4	0.096	4.8	LOS A	0.4	3.5	0.18	0.49	55.2
North: Railway Parade											
7	L2	291	5.2	0.611	25.6	LOS B	6.5	44.9	1.00	1.21	42.0
8	T1	10	50.0	0.611	25.8	LOS B	6.5	44.9	1.00	1.21	42.6
9	R2	135	6.7	0.379	24.6	LOS B	2.5	17.6	0.94	1.02	44.3
Approach		436	6.7	0.611	25.3	LOS B	6.5	44.9	0.98	1.15	42.7
West: Glenfield Road											
10	L2	269	4.1	0.589	16.7	LOS B	5.4	36.6	0.98	1.11	46.8
11	T1	287	9.1	0.649	16.8	LOS B	7.3	51.2	1.00	1.16	47.2
12	R2	153	4.6	0.649	22.3	LOS B	7.3	51.2	1.00	1.16	47.2
Approach		709	6.2	0.649	18.0	LOS B	7.3	51.2	0.99	1.14	47.1
All Vehicles		2751	5.3	0.702	13.7	LOS A	7.3	51.2	0.72	0.86	49.5

Table B3.1.4 AM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde AM 2024 + SSD

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	338	2.1	0.340	5.1	LOS A	2.0	13.0	0.47	0.57	54.4
2	T1	12	8.3	0.665	5.0	LOS A	6.2	41.2	0.63	0.67	51.6
3	R2	902	2.7	0.665	10.5	LOS A	6.2	41.2	0.63	0.67	51.8
Approach		1252	2.6	0.665	8.9	LOS A	6.2	41.2	0.58	0.64	52.5
East: Cambridge Avenue											
4	L2	190	3.2	0.034	4.2	LOS A	0.1	1.0	0.08	0.47	55.5
5	T1	51	2.0	0.062	4.5	LOS A	0.3	1.9	0.39	0.53	55.0
6	R2	23	8.7	0.062	10.1	LOS A	0.3	1.9	0.39	0.53	55.0
Approach		264	3.4	0.081	4.8	LOS A	0.3	1.9	0.17	0.49	55.3
North: Railway Parade											
7	L2	296	6.8	0.666	33.6	LOS C	8.3	58.9	1.00	1.29	38.5
8	T1	11	63.6	0.666	33.8	LOS C	8.3	58.9	1.00	1.29	38.9
9	R2	140	10.0	0.419	28.1	LOS B	3.1	22.2	0.98	1.06	42.5
Approach		447	9.2	0.666	31.9	LOS C	8.3	58.9	0.99	1.22	39.7
West: Glenfield Road											
10	L2	266	4.1	0.491	13.2	LOS A	3.9	26.7	0.93	1.03	49.0
11	T1	199	2.5	0.511	11.8	LOS A	4.7	31.7	0.97	1.01	50.1
12	R2	153	4.6	0.511	17.3	LOS B	4.7	31.7	0.97	1.01	50.2
Approach		618	3.7	0.511	13.8	LOS A	4.7	31.7	0.95	1.02	49.7
All Vehicles		2581	4.1	0.666	13.7	LOS A	8.3	58.9	0.70	0.82	49.3

Table B3.1.5 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde AM 2024 +SSD + Rezone

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	339	2.1	0.356	5.3	LOS A	1.9	12.8	0.49	0.61	54.3
2	T1	11	9.1	0.708	5.9	LOS A	7.1	47.8	0.67	0.74	51.4
3	R2	937	2.9	0.708	11.3	LOS A	7.1	47.8	0.67	0.74	51.7
Approach		1287	2.7	0.708	9.7	LOS A	7.1	47.8	0.63	0.70	52.3
East: Cambridge Avenue											
4	L2	201	4.5	0.039	4.2	LOS A	0.2	1.2	0.05	0.47	55.5
5	T1	92	26.1	0.093	4.9	LOS A	0.4	3.3	0.41	0.52	54.8
6	R2	23	8.7	0.093	10.3	LOS A	0.4	3.3	0.41	0.52	55.0
Approach		316	11.1	0.093	4.8	LOS A	0.4	3.3	0.18	0.49	55.3
North: Railway Parade											
7	L2	296	6.8	0.638	27.6	LOS B	7.0	49.3	1.00	1.24	41.1
8	T1	11	63.6	0.638	27.9	LOS B	7.0	49.3	1.00	1.24	41.5
9	R2	140	10.0	0.406	25.9	LOS B	2.8	19.8	0.95	1.04	43.5
Approach		447	9.2	0.638	27.1	LOS B	7.0	49.3	0.98	1.18	41.8
West: Glenfield Road											
10	L2	266	4.1	0.599	17.2	LOS B	5.6	37.8	0.99	1.12	46.6
11	T1	294	9.5	0.661	17.4	LOS B	7.6	53.3	1.00	1.17	46.8
12	R2	153	4.6	0.661	22.9	LOS B	7.6	53.3	1.00	1.17	46.9
Approach		713	6.5	0.661	18.5	LOS B	7.6	53.3	0.99	1.15	46.7
All Vehicles		2763	5.7	0.708	14.2	LOS A	7.6	53.3	0.73	0.87	49.1

Table B3.2.1 PM 2014

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde PM 2014

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	202	1.5	0.209	5.9	LOS A	1.1	7.4	0.56	0.65	54.0
2	T1	11	0.0	0.217	5.4	LOS A	1.2	8.1	0.56	0.71	52.1
3	R2	237	0.8	0.217	10.9	LOS A	1.2	8.1	0.56	0.71	52.3
Approach		450	1.1	0.217	8.5	LOS A	1.2	8.1	0.56	0.68	53.0
East: Cambridge Avenue											
4	L2	798	2.5	0.143	4.3	LOS A	0.7	4.6	0.09	0.49	55.4
5	T1	141	6.4	0.336	5.3	LOS A	1.9	13.0	0.53	0.66	53.3
6	R2	241	5.0	0.336	10.8	LOS A	1.9	13.0	0.53	0.66	53.5
Approach		1180	3.5	0.339	5.7	LOS A	1.9	13.0	0.23	0.54	54.7
North: Railway Parade											
7	L2	73	4.1	0.085	5.8	LOS A	0.4	2.6	0.52	0.62	54.1
8	T1	7	0.0	0.085	5.6	LOS A	0.4	2.6	0.52	0.62	55.9
9	R2	90	8.9	0.083	10.9	LOS A	0.4	2.7	0.51	0.70	52.0
Approach		170	6.5	0.085	8.5	LOS A	0.4	2.7	0.51	0.66	53.0
West: Glenfield Road											
10	L2	180	6.7	0.237	6.1	LOS A	1.2	8.5	0.56	0.65	53.8
11	T1	46	0.0	0.261	6.0	LOS A	1.5	9.9	0.56	0.65	55.5
12	R2	294	4.1	0.261	11.1	LOS A	1.5	9.9	0.56	0.73	52.0
Approach		520	4.6	0.261	8.9	LOS A	1.5	9.9	0.56	0.69	52.9
All Vehicles		2320	3.5	0.339	7.2	LOS A	1.9	13.0	0.39	0.61	53.8

Table B3.2.2 PM 2024

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde PM 2024

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	346	0.9	0.321	5.9	LOS A	1.8	11.8	0.63	0.71	53.8
2	T1	12	0.0	0.295	6.2	LOS A	1.5	10.0	0.63	0.81	51.8
3	R2	249	0.8	0.295	11.7	LOS A	1.5	10.0	0.63	0.81	52.0
Approach		607	0.8	0.321	8.3	LOS A	1.8	11.8	0.63	0.75	53.0
East: Cambridge Avenue											
4	L2	839	2.5	0.165	4.3	LOS A	0.8	5.6	0.06	0.48	55.5
5	T1	237	3.8	0.392	5.7	LOS A	2.4	16.0	0.59	0.67	53.8
6	R2	254	5.1	0.392	11.4	LOS A	2.4	16.0	0.62	0.71	53.2
Approach		1330	3.2	0.392	5.9	LOS A	2.4	16.0	0.26	0.56	54.7
North: Railway Parade											
7	L2	77	3.9	0.100	6.2	LOS A	0.5	3.1	0.56	0.66	53.9
8	T1	7	0.0	0.100	6.1	LOS A	0.5	3.1	0.56	0.66	55.8
9	R2	149	5.4	0.141	11.1	LOS A	0.7	4.8	0.56	0.74	51.9
Approach		233	4.7	0.141	9.4	LOS A	0.7	4.8	0.56	0.71	52.7
West: Glenfield Road											
10	L2	208	6.3	0.280	6.4	LOS A	1.5	10.5	0.60	0.67	53.7
11	T1	53	0.0	0.309	6.2	LOS A	1.8	12.4	0.60	0.68	55.3
12	R2	341	3.8	0.309	11.3	LOS A	1.8	12.4	0.60	0.75	51.9
Approach		602	4.3	0.309	9.2	LOS A	1.8	12.4	0.60	0.72	52.7
All Vehicles		2772	3.1	0.392	7.4	LOS A	2.4	16.0	0.44	0.65	53.7

Table B3.2.3 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde PM 2024 + Rezone

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	346	0.9	0.339	6.1	LOS A	1.9	12.5	0.67	0.74	53.7
2	T1	12	0.0	0.329	6.6	LOS A	1.7	11.3	0.67	0.86	51.7
3	R2	259	1.5	0.329	12.1	LOS A	1.7	11.3	0.67	0.86	51.9
Approach		617	1.1	0.339	8.7	LOS A	1.9	12.5	0.67	0.79	52.8
East: Cambridge Avenue											
4	L2	874	2.6	0.185	4.2	LOS A	0.9	6.7	0.03	0.47	55.6
5	T1	340	10.3	0.438	5.9	LOS A	2.7	19.0	0.60	0.66	53.8
6	R2	254	5.1	0.438	11.5	LOS A	2.7	19.0	0.65	0.71	53.2
Approach		1468	4.8	0.438	5.8	LOS A	2.7	19.0	0.27	0.55	54.8
North: Railway Parade											
7	L2	77	3.9	0.105	6.5	LOS A	0.5	3.2	0.59	0.68	53.8
8	T1	7	0.0	0.105	6.3	LOS A	0.5	3.2	0.59	0.68	55.6
9	R2	149	5.4	0.146	11.3	LOS A	0.7	5.1	0.59	0.76	51.8
Approach		233	4.7	0.146	9.6	LOS A	0.7	5.1	0.59	0.73	52.5
West: Glenfield Road											
10	L2	208	6.3	0.313	6.7	LOS A	1.7	12.6	0.62	0.69	53.5
11	T1	98	26.5	0.345	6.5	LOS A	2.1	14.6	0.62	0.71	53.7
12	R2	341	3.8	0.345	11.5	LOS A	2.1	14.6	0.63	0.75	52.1
Approach		647	8.0	0.345	9.2	LOS A	2.1	14.6	0.62	0.73	52.8
All Vehicles		2965	4.8	0.438	7.4	LOS A	2.7	19.0	0.46	0.66	53.7

Table B3.2.4 PM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde PM 2024 + SSD

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	346	0.9	0.321	5.9	LOS A	1.8	11.8	0.63	0.71	53.8
2	T1	12	0.0	0.296	6.3	LOS A	1.5	10.0	0.63	0.81	51.8
3	R2	249	0.8	0.296	11.8	LOS A	1.5	10.0	0.63	0.81	52.0
Approach		607	0.8	0.321	8.3	LOS A	1.8	11.8	0.63	0.75	53.0
East: Cambridge Avenue											
4	L2	837	2.4	0.165	4.3	LOS A	0.8	5.6	0.06	0.48	55.5
5	T1	235	3.8	0.391	5.7	LOS A	2.3	15.9	0.59	0.68	53.8
6	R2	254	5.1	0.391	11.4	LOS A	2.3	15.9	0.62	0.71	53.2
Approach		1326	3.2	0.391	5.9	LOS A	2.3	15.9	0.26	0.56	54.7
North: Railway Parade											
7	L2	82	4.9	0.108	6.3	LOS A	0.5	3.4	0.56	0.66	53.9
8	T1	9	0.0	0.108	6.1	LOS A	0.5	3.4	0.56	0.66	55.7
9	R2	154	5.8	0.146	11.1	LOS A	0.7	5.0	0.56	0.74	51.9
Approach		245	5.3	0.146	9.3	LOS A	0.7	5.0	0.56	0.71	52.7
West: Glenfield Road											
10	L2	207	6.3	0.281	6.4	LOS A	1.5	10.5	0.60	0.68	53.6
11	T1	55	1.8	0.310	6.2	LOS A	1.8	12.4	0.60	0.68	55.2
12	R2	341	3.8	0.310	11.3	LOS A	1.8	12.4	0.60	0.75	51.9
Approach		603	4.5	0.310	9.2	LOS A	1.8	12.4	0.60	0.72	52.7
All Vehicles		2781	3.1	0.391	7.4	LOS A	2.3	15.9	0.44	0.65	53.7

Table B3.2.5 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Cambridge Ave & Canterbury Rd & Glenfield Rd & Railway Pde PM 2024 + SSD + Rezone

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Canterbury Road											
1	L2	346	0.9	0.339	6.1	LOS A	1.9	12.5	0.67	0.74	53.7
2	T1	12	8.3	0.330	6.7	LOS A	1.7	11.4	0.67	0.86	51.5
3	R2	259	1.5	0.330	12.1	LOS A	1.7	11.4	0.67	0.86	51.9
Approach		617	1.3	0.339	8.7	LOS A	1.9	12.5	0.67	0.79	52.8
East: Cambridge Avenue											
4	L2	872	2.5	0.184	4.2	LOS A	0.9	6.6	0.03	0.47	55.6
5	T1	334	10.2	0.435	5.9	LOS A	2.7	18.7	0.60	0.66	53.8
6	R2	254	5.1	0.435	11.5	LOS A	2.7	18.7	0.64	0.72	53.2
Approach		1460	4.7	0.435	5.8	LOS A	2.7	18.7	0.27	0.56	54.8
North: Railway Parade											
7	L2	82	4.9	0.113	6.5	LOS A	0.5	3.6	0.59	0.69	53.7
8	T1	9	0.0	0.113	6.4	LOS A	0.5	3.6	0.59	0.69	55.6
9	R2	154	5.8	0.152	11.3	LOS A	0.8	5.3	0.59	0.76	51.8
Approach		245	5.3	0.152	9.5	LOS A	0.8	5.3	0.59	0.73	52.5
West: Glenfield Road											
10	L2	207	6.3	0.312	6.7	LOS A	1.7	12.6	0.62	0.69	53.5
11	T1	98	26.5	0.344	6.5	LOS A	2.1	14.5	0.62	0.71	53.7
12	R2	341	3.8	0.344	11.5	LOS A	2.1	14.5	0.63	0.75	52.1
Approach		646	8.0	0.344	9.2	LOS A	2.1	14.5	0.62	0.73	52.8
All Vehicles		2968	4.8	0.435	7.5	LOS A	2.7	18.7	0.46	0.66	53.7

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B4

Intersection Railway Parade & GWS Road 2

SIDRA Report

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Table B4.1.1 AM 2014

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 AM 2014

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	210	5.7	0.097	1.1	LOS A	0.6	4.4	0.37	0.02	58.2
3	R2	6	0.0	0.097	6.9	LOS A	0.6	4.4	0.45	0.02	30.2
Approach		216	5.6	0.097	1.3	NA	0.6	4.4	0.37	0.02	56.8
East: GWS Road 2											
4	L2	6	0.0	0.005	0.7	LOS A	0.0	0.1	0.27	0.13	29.1
6	R2	1	0.0	0.005	1.0	LOS A	0.0	0.1	0.27	0.13	29.0
Approach		7	0.0	0.005	0.7	LOS A	0.0	0.1	0.27	0.13	29.1
North: Railway Parade											
7	L2	1	0.0	0.102	5.5	LOS A	0.0	0.0	0.00	0.00	58.1
8	T1	380	6.1	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		381	6.0	0.102	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		604	5.8	0.102	0.5	NA	0.6	4.4	0.14	0.01	58.0

Table B4.1.2 AM 2024

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 AM 2024

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	296	4.4	0.134	1.3	LOS A	1.0	6.5	0.40	0.01	58.2
3	R2	6	0.0	0.134	7.1	LOS A	1.0	6.5	0.49	0.02	30.2
Approach		302	4.3	0.134	1.4	NA	1.0	6.5	0.41	0.01	57.1
East: GWS Road 2											
4	L2	6	0.0	0.005	0.8	LOS A	0.0	0.1	0.29	0.14	29.1
6	R2	1	0.0	0.005	1.1	LOS A	0.0	0.1	0.29	0.14	29.0
Approach		7	0.0	0.005	0.8	LOS A	0.0	0.1	0.29	0.14	29.1
North: Railway Parade											
7	L2	1	0.0	0.111	5.5	LOS A	0.0	0.0	0.00	0.00	58.2
8	T1	416	5.8	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		417	5.8	0.111	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		726	5.1	0.134	0.6	NA	1.0	6.5	0.17	0.01	58.1

Table B4.1.3 AM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 AM 2024 + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	296	4.4	0.134	1.3	LOS A	1.0	6.5	0.40	0.01	58.2
3	R2	6	0.0	0.134	7.1	LOS A	1.0	6.5	0.49	0.02	30.2
Approach		302	4.3	0.134	1.4	NA	1.0	6.5	0.41	0.01	57.1
East: GWS Road 2											
4	L2	6	0.0	0.005	0.8	LOS A	0.0	0.1	0.29	0.14	29.1
6	R2	1	0.0	0.005	1.1	LOS A	0.0	0.1	0.29	0.14	29.0
Approach		7	0.0	0.005	0.8	LOS A	0.0	0.1	0.29	0.14	29.1
North: Railway Parade											
7	L2	1	0.0	0.111	5.5	LOS A	0.0	0.0	0.00	0.00	58.2
8	T1	416	5.8	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		417	5.8	0.111	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		726	5.1	0.134	0.6	NA	1.0	6.5	0.17	0.01	58.1

Table B4.1.4 AM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 AM 2024 + SSD

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	296	4.4	0.026	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		296	4.4	0.130	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: GWS Road 2											
4	L2	14	78.6	0.016	1.3	LOS A	0.1	0.7	0.34	0.21	28.1
6	R2	1	0.0	0.016	1.6	LOS A	0.1	0.7	0.34	0.21	29.0
Approach		15	73.3	0.016	1.3	LOS A	0.1	0.7	0.34	0.21	28.1
North: Railway Parade											
8	T1	416	5.8	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		416	5.8	0.111	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		727	6.6	0.130	0.0	NA	0.1	0.7	0.01	0.00	58.6

Table B4.1.5 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 AM 2024 + SSD

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	296	4.4	0.026	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		296	4.4	0.130	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: GWS Road 2											
4	L2	14	78.6	0.016	1.3	LOS A	0.1	0.7	0.34	0.21	28.1
6	R2	1	0.0	0.016	1.6	LOS A	0.1	0.7	0.34	0.21	29.0
Approach		15	73.3	0.016	1.3	LOS A	0.1	0.7	0.34	0.21	28.1
North: Railway Parade											
8	T1	416	5.8	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		416	5.8	0.111	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		727	6.6	0.130	0.0	NA	0.1	0.7	0.01	0.00	58.6

Table B4.2.1 PM 2014

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 PM 2014

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	427	5.6	0.190	0.5	LOS A	1.2	8.1	0.26	0.00	58.9
3	R2	1	0.0	0.190	6.1	LOS A	1.2	8.1	0.31	0.00	30.4
Approach		428	5.6	0.190	0.5	NA	1.2	8.1	0.26	0.00	58.7
East: GWS Road 2											
4	L2	1	0.0	0.002	1.0	LOS A	0.0	0.0	0.18	0.10	29.1
6	R2	1	0.0	0.002	1.2	LOS A	0.0	0.0	0.18	0.10	29.1
Approach		2	0.0	0.002	1.1	LOS A	0.0	0.0	0.18	0.10	29.1
North: Railway Parade											
7	L2	1	0.0	0.044	5.5	LOS A	0.0	0.0	0.00	0.01	57.9
8	T1	163	6.7	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	59.8
Approach		164	6.7	0.044	0.0	NA	0.0	0.0	0.00	0.00	59.8
All Vehicles		594	5.9	0.190	0.4	NA	1.2	8.1	0.19	0.00	58.8

Table B4.2.2 PM 2024

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 PM 2024

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	467	5.4	0.207	0.7	LOS A	1.4	9.5	0.32	0.00	58.6
3	R2	1	0.0	0.207	6.4	LOS A	1.4	9.5	0.38	0.00	30.3
Approach		468	5.3	0.207	0.8	NA	1.4	9.5	0.32	0.00	58.5
East: GWS Road 2											
4	L2	1	0.0	0.002	1.2	LOS A	0.0	0.0	0.23	0.13	29.1
6	R2	1	0.0	0.002	1.5	LOS A	0.0	0.0	0.23	0.13	29.0
Approach		2	0.0	0.002	1.3	LOS A	0.0	0.0	0.23	0.13	29.0
North: Railway Parade											
7	L2	1	0.0	0.060	5.5	LOS A	0.0	0.0	0.00	0.01	58.0
8	T1	227	5.3	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		228	5.3	0.060	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		698	5.3	0.207	0.5	NA	1.4	9.5	0.21	0.00	58.8

Table B4.2.3 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 PM 2024 + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	467	5.4	0.207	0.7	LOS A	1.4	9.5	0.32	0.00	58.6
3	R2	1	0.0	0.207	6.4	LOS A	1.4	9.5	0.38	0.00	30.3
Approach		468	5.3	0.207	0.8	NA	1.4	9.5	0.32	0.00	58.5
East: GWS Road 2											
4	L2	1	0.0	0.002	1.2	LOS A	0.0	0.0	0.23	0.13	29.1
6	R2	1	0.0	0.002	1.5	LOS A	0.0	0.0	0.23	0.13	29.0
Approach		2	0.0	0.002	1.3	LOS A	0.0	0.0	0.23	0.13	29.0
North: Railway Parade											
7	L2	1	0.0	0.060	5.5	LOS A	0.0	0.0	0.00	0.01	58.0
8	T1	227	5.3	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		228	5.3	0.060	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		698	5.3	0.207	0.5	NA	1.4	9.5	0.21	0.00	58.8

Table B4.2.4 PM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 PM 2024 + SSD

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	467	5.4	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		467	5.4	0.207	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: GWS Road 2											
4	L2	11	9.1	0.009	0.5	LOS A	0.0	0.2	0.20	0.08	29.1
6	R2	1	0.0	0.009	0.8	LOS A	0.0	0.2	0.20	0.08	29.1
Approach		12	8.3	0.009	0.5	LOS A	0.0	0.2	0.20	0.08	29.1
North: Railway Parade											
8	T1	227	5.3	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		227	5.3	0.060	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		706	5.4	0.207	0.0	NA	0.0	0.2	0.00	0.00	58.9

Table B4.2.5 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Railway Parade & GWS Road 2 PM 2024 + SSD + Rezone

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Railway Parade											
2	T1	467	5.4	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		467	5.4	0.207	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: GWS Road 2											
4	L2	11	9.1	0.009	0.5	LOS A	0.0	0.2	0.20	0.08	29.1
6	R2	1	0.0	0.009	0.8	LOS A	0.0	0.2	0.20	0.08	29.1
Approach		12	8.3	0.009	0.5	LOS A	0.0	0.2	0.20	0.08	29.1
North: Railway Parade											
8	T1	227	5.3	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		227	5.3	0.060	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		706	5.4	0.207	0.0	NA	0.0	0.2	0.00	0.00	58.9

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B5

Intersection Glenfield Rd & Hurlstone Agricultural College

SIDRA Report

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Table B5.1.1 AM 2014

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag AM 2014

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	2	50.0	0.299	6.8	LOS A	1.9	12.5	0.64	0.74	49.6
2	T1	64	1.6	0.299	6.4	LOS A	1.9	12.5	0.64	0.74	52.0
3	R2	231	0.9	0.299	11.5	LOS A	1.9	12.5	0.64	0.74	52.0
Approach		297	1.3	0.299	10.4	LOS A	1.9	12.5	0.64	0.74	52.0
East: Glenfield Road West											
4	L2	607	0.8	0.638	4.2	LOS A	7.2	47.9	0.36	0.52	53.1
5	T1	4	0.0	0.638	4.2	LOS A	7.2	47.9	0.36	0.52	54.4
6	R2	451	4.2	0.638	9.3	LOS A	7.2	47.9	0.36	0.52	54.3
Approach		1062	2.3	0.638	6.3	LOS A	7.2	47.9	0.36	0.52	53.6
North: Glenfield Road East											
7	L2	403	4.5	0.389	5.2	LOS A	2.8	19.0	0.54	0.59	53.7
8	T1	46	0.0	0.389	5.2	LOS A	2.8	19.0	0.54	0.59	55.2
9	R2	11	0.0	0.389	10.2	LOS A	2.8	19.0	0.54	0.59	55.3
Approach		460	3.9	0.389	5.3	LOS A	2.8	19.0	0.54	0.59	53.9
West: SW Railway Access											
10	L2	14	14.3	0.026	8.0	LOS A	0.2	1.1	0.69	0.65	51.3
11	T1	2	0.0	0.026	8.0	LOS A	0.2	1.1	0.69	0.65	53.0
12	R2	4	0.0	0.026	13.0	LOS A	0.2	1.1	0.69	0.65	53.0
Approach		20	10.0	0.026	9.0	LOS A	0.2	1.1	0.69	0.65	51.8
All Vehicles		1839	2.6	0.638	6.7	LOS A	7.2	47.9	0.46	0.57	53.4

Table B5.1.2 AM 2024

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag AM 2024

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	2	50.0	0.382	8.5	LOS A	2.7	17.9	0.80	0.85	48.6
2	T1	68	1.5	0.382	8.1	LOS A	2.7	17.9	0.80	0.85	50.9
3	R2	242	0.8	0.382	13.1	LOS A	2.7	17.9	0.80	0.85	50.9
Approach		312	1.3	0.382	12.0	LOS A	2.7	17.9	0.80	0.85	50.9
East: Glenfield Road West											
4	L2	638	0.8	0.770	4.4	LOS A	12.6	83.3	0.49	0.51	52.4
5	T1	4	0.0	0.770	4.4	LOS A	12.6	83.3	0.49	0.51	53.7
6	R2	649	3.1	0.770	9.5	LOS A	12.6	83.3	0.49	0.51	53.6
Approach		1291	1.9	0.770	6.9	LOS A	12.6	83.3	0.49	0.51	53.0
North: Glenfield Road East											
7	L2	492	3.9	0.472	5.3	LOS A	3.8	25.7	0.61	0.61	53.5
8	T1	48	0.0	0.472	5.4	LOS A	3.8	25.7	0.61	0.61	55.0
9	R2	12	0.0	0.472	10.4	LOS A	3.8	25.7	0.61	0.61	55.0
Approach		552	3.4	0.472	5.5	LOS A	3.8	25.7	0.61	0.61	53.7
West: SW Railway Access											
10	L2	15	13.3	0.035	10.5	LOS A	0.2	1.6	0.81	0.72	49.7
11	T1	2	0.0	0.035	10.4	LOS A	0.2	1.6	0.81	0.72	51.2
12	R2	4	0.0	0.035	15.5	LOS B	0.2	1.6	0.81	0.72	51.2
Approach		21	9.5	0.035	11.4	LOS A	0.2	1.6	0.81	0.72	50.1
All Vehicles		2176	2.3	0.770	7.3	LOS A	12.6	83.3	0.57	0.59	52.8

Table B5.1.3 AM 2014 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag AM 2024 + Rezone

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	2	50.0	0.438	10.2	LOS A	3.5	22.9	0.89	0.93	47.6
2	T1	68	1.5	0.438	9.8	LOS A	3.5	22.9	0.89	0.93	49.8
3	R2	242	0.8	0.438	14.9	LOS B	3.5	22.9	0.89	0.93	49.8
Approach		312	1.3	0.438	13.7	LOS A	3.5	22.9	0.89	0.93	49.8
East: Glenfield Road West											
4	L2	638	0.8	0.829	4.5	LOS A	17.1	115.0	0.58	0.50	52.0
5	T1	4	0.0	0.829	4.6	LOS A	17.1	115.0	0.58	0.50	53.3
6	R2	744	5.8	0.829	9.7	LOS A	17.1	115.0	0.58	0.50	53.1
Approach		1386	3.5	0.829	7.3	LOS A	17.1	115.0	0.58	0.50	52.6
North: Glenfield Road East											
7	L2	533	7.9	0.519	5.5	LOS A	4.5	31.0	0.65	0.63	53.3
8	T1	48	0.0	0.519	5.5	LOS A	4.5	31.0	0.65	0.63	54.9
9	R2	12	0.0	0.519	10.5	LOS A	4.5	31.0	0.65	0.63	54.9
Approach		593	7.1	0.519	5.6	LOS A	4.5	31.0	0.65	0.63	53.4
West: SW Railway Access											
10	L2	15	13.3	0.042	12.3	LOS A	0.3	2.0	0.88	0.75	48.5
11	T1	2	0.0	0.042	12.3	LOS A	0.3	2.0	0.88	0.75	49.9
12	R2	4	0.0	0.042	17.3	LOS B	0.3	2.0	0.88	0.75	50.0
Approach		21	9.5	0.042	13.3	LOS A	0.3	2.0	0.88	0.75	48.9
All Vehicles		2312	4.2	0.829	7.8	LOS A	17.1	115.0	0.65	0.59	52.4

Table B5.1.4 AM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag AM 2024 + SSD

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	2	50.0	0.384	8.6	LOS A	2.7	18.0	0.81	0.85	48.6
2	T1	68	1.5	0.384	8.2	LOS A	2.7	18.0	0.81	0.85	50.9
3	R2	242	0.8	0.384	13.2	LOS A	2.7	18.0	0.81	0.85	50.9
Approach		312	1.3	0.384	12.1	LOS A	2.7	18.0	0.81	0.85	50.9
East: Glenfield Road West											
4	L2	638	0.8	0.773	4.4	LOS A	12.7	84.6	0.50	0.51	52.4
5	T1	4	0.0	0.773	4.4	LOS A	12.7	84.6	0.50	0.51	53.7
6	R2	653	3.4	0.773	9.5	LOS A	12.7	84.6	0.50	0.51	53.6
Approach		1295	2.1	0.773	7.0	LOS A	12.7	84.6	0.50	0.51	53.0
North: Glenfield Road East											
7	L2	494	4.5	0.475	5.4	LOS A	3.9	26.1	0.62	0.61	53.5
8	T1	48	0.0	0.475	5.4	LOS A	3.9	26.1	0.62	0.61	55.0
9	R2	12	0.0	0.475	10.4	LOS A	3.9	26.1	0.62	0.61	55.0
Approach		554	4.0	0.475	5.5	LOS A	3.9	26.1	0.62	0.61	53.7
West: SW Railway Access											
10	L2	15	13.3	0.036	10.6	LOS A	0.2	1.6	0.81	0.72	49.6
11	T1	2	0.0	0.036	10.5	LOS A	0.2	1.6	0.81	0.72	51.1
12	R2	4	0.0	0.036	15.5	LOS B	0.2	1.6	0.81	0.72	51.2
Approach		21	9.5	0.036	11.5	LOS A	0.2	1.6	0.81	0.72	50.1
All Vehicles		2182	2.5	0.773	7.4	LOS A	12.7	84.6	0.57	0.59	52.8

Table B5.1.5 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag AM 2024 + SSD + Rezone

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	2	50.0	0.441	10.3	LOS A	3.5	23.2	0.90	0.93	47.5
2	T1	68	1.5	0.441	9.9	LOS A	3.5	23.2	0.90	0.93	49.7
3	R2	242	0.8	0.441	15.0	LOS B	3.5	23.2	0.90	0.93	49.8
Approach		312	1.3	0.441	13.8	LOS A	3.5	23.2	0.90	0.93	49.7
East: Glenfield Road West											
4	L2	638	0.8	0.832	4.6	LOS A	17.4	116.9	0.59	0.50	52.0
5	T1	4	0.0	0.832	4.6	LOS A	17.4	116.9	0.59	0.50	53.3
6	R2	748	6.0	0.832	9.7	LOS A	17.4	116.9	0.59	0.50	53.1
Approach		1390	3.6	0.832	7.3	LOS A	17.4	116.9	0.59	0.50	52.6
North: Glenfield Road East											
7	L2	535	8.4	0.522	5.5	LOS A	4.5	31.5	0.66	0.63	53.3
8	T1	48	0.0	0.522	5.5	LOS A	4.5	31.5	0.66	0.63	54.8
9	R2	12	0.0	0.522	10.5	LOS A	4.5	31.5	0.66	0.63	54.9
Approach		595	7.6	0.522	5.6	LOS A	4.5	31.5	0.66	0.63	53.4
West: SW Railway Access											
10	L2	15	13.3	0.042	12.4	LOS A	0.3	2.0	0.88	0.76	48.4
11	T1	2	0.0	0.042	12.4	LOS A	0.3	2.0	0.88	0.76	49.9
12	R2	4	0.0	0.042	17.4	LOS B	0.3	2.0	0.88	0.76	49.9
Approach		21	9.5	0.042	13.4	LOS A	0.3	2.0	0.88	0.76	48.8
All Vehicles		2318	4.4	0.832	7.8	LOS A	17.4	116.9	0.65	0.59	52.4

Table B5.2.1 PM 2014

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag PM 2014

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	1	0.0	0.220	6.6	LOS A	1.3	8.4	0.61	0.74	50.6
2	T1	38	0.0	0.220	6.7	LOS A	1.3	8.4	0.61	0.74	51.8
3	R2	177	1.1	0.220	11.7	LOS A	1.3	8.4	0.61	0.74	51.8
Approach		216	0.9	0.220	10.8	LOS A	1.3	8.4	0.61	0.74	51.8
East: Glenfield Road West											
4	L2	88	1.1	0.369	3.8	LOS A	2.8	18.9	0.10	0.60	52.3
5	T1	1	0.0	0.369	3.8	LOS A	2.8	18.9	0.10	0.60	53.5
6	R2	530	3.4	0.369	8.9	LOS A	2.8	18.9	0.10	0.60	53.4
Approach		619	3.1	0.369	8.2	LOS A	2.8	18.9	0.10	0.60	53.3
North: Glenfield Road East											
7	L2	494	4.0	0.405	4.9	LOS A	3.0	20.2	0.49	0.55	54.0
8	T1	10	0.0	0.405	4.9	LOS A	3.0	20.2	0.49	0.55	55.5
9	R2	2	0.0	0.405	9.9	LOS A	3.0	20.2	0.49	0.55	55.6
Approach		506	4.0	0.405	4.9	LOS A	3.0	20.2	0.49	0.55	54.1
West: SW Railway Access											
10	L2	4	0.0	0.022	7.6	LOS A	0.1	0.8	0.67	0.60	52.6
11	T1	13	0.0	0.022	7.6	LOS A	0.1	0.8	0.67	0.60	53.8
12	R2	1	0.0	0.022	12.7	LOS A	0.1	0.8	0.67	0.60	53.9
Approach		18	0.0	0.022	7.9	LOS A	0.1	0.8	0.67	0.60	53.5
All Vehicles		1359	3.0	0.405	7.4	LOS A	3.0	20.2	0.34	0.61	53.3

Table B5.2.2 PM 2024

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag PM 2024

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hurlstone Ag											
1	L2	1	0.0	0.245	7.3	LOS A	1.5	9.7	0.67	0.78	50.2
2	T1	40	0.0	0.245	7.4	LOS A	1.5	9.7	0.67	0.78	51.3
3	R2	186	1.1	0.245	12.4	LOS A	1.5	9.7	0.67	0.78	51.3
Approach		227	0.9	0.245	11.5	LOS A	1.5	9.7	0.67	0.78	51.3
East: Glenfield Road West											
4	L2	93	1.1	0.420	3.8	LOS A	3.6	24.3	0.12	0.60	52.2
5	T1	1	0.0	0.420	3.8	LOS A	3.6	24.3	0.12	0.60	53.4
6	R2	613	3.1	0.420	8.9	LOS A	3.6	24.3	0.12	0.60	53.4
Approach		707	2.8	0.420	8.2	LOS A	3.6	24.3	0.12	0.60	53.2
North: Glenfield Road East											
7	L2	798	2.6	0.638	5.4	LOS A	6.3	42.2	0.66	0.61	53.5
8	T1	10	0.0	0.638	5.4	LOS A	6.3	42.2	0.66	0.61	55.0
9	R2	2	0.0	0.638	10.4	LOS A	6.3	42.2	0.66	0.61	55.0
Approach		810	2.6	0.638	5.4	LOS A	6.3	42.2	0.66	0.61	53.5
West: SW Railway Access											
10	L2	4	0.0	0.025	8.5	LOS A	0.1	1.0	0.72	0.63	51.9
11	T1	14	0.0	0.025	8.6	LOS A	0.1	1.0	0.72	0.63	53.2
12	R2	1	0.0	0.025	13.6	LOS A	0.1	1.0	0.72	0.63	53.2
Approach		19	0.0	0.025	8.8	LOS A	0.1	1.0	0.72	0.63	52.9
All Vehicles		1763	2.4	0.638	7.3	LOS A	6.3	42.2	0.45	0.62	53.1

Table B5.2.3 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag PM 2024 + Rezone

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hurlstone Ag											
1	L2	1	0.0	0.256	7.8	LOS A	1.6	10.4	0.70	0.80	49.9
2	T1	40	0.0	0.256	7.9	LOS A	1.6	10.4	0.70	0.80	51.0
3	R2	186	1.1	0.256	12.9	LOS A	1.6	10.4	0.70	0.80	51.0
Approach		227	0.9	0.256	12.0	LOS A	1.6	10.4	0.70	0.80	51.0
East: Glenfield Road West											
4	L2	93	1.1	0.451	3.8	LOS A	4.2	29.0	0.12	0.59	52.2
5	T1	1	0.0	0.451	3.8	LOS A	4.2	29.0	0.12	0.59	53.4
6	R2	658	6.8	0.451	8.9	LOS A	4.2	29.0	0.12	0.59	53.2
Approach		752	6.1	0.451	8.3	LOS A	4.2	29.0	0.12	0.59	53.1
North: Glenfield Road East											
7	L2	898	5.2	0.724	6.1	LOS A	8.7	59.6	0.76	0.65	53.2
8	T1	10	0.0	0.724	6.1	LOS A	8.7	59.6	0.76	0.65	54.6
9	R2	1	0.0	0.724	11.1	LOS A	8.7	59.6	0.76	0.65	54.7
Approach		909	5.2	0.724	6.1	LOS A	8.7	59.6	0.76	0.65	53.2
West: SW Railway Access											
10	L2	4	0.0	0.026	9.2	LOS A	0.2	1.0	0.75	0.65	51.4
11	T1	14	0.0	0.026	9.2	LOS A	0.2	1.0	0.75	0.65	52.7
12	R2	1	0.0	0.026	14.3	LOS A	0.2	1.0	0.75	0.65	52.7
Approach		19	0.0	0.026	9.5	LOS A	0.2	1.0	0.75	0.65	52.4
All Vehicles		1907	5.0	0.724	7.7	LOS A	8.7	59.6	0.50	0.64	52.9

Table B5.2.4 PM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag PM 2024 + SSD

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	1	0.0	0.245	7.3	LOS A	1.5	9.7	0.67	0.78	50.2
2	T1	40	0.0	0.245	7.4	LOS A	1.5	9.7	0.67	0.78	51.3
3	R2	186	1.1	0.245	12.4	LOS A	1.5	9.7	0.67	0.78	51.3
Approach		227	0.9	0.245	11.5	LOS A	1.5	9.7	0.67	0.78	51.3
East: Glenfield Road West											
4	L2	93	1.1	0.418	3.8	LOS A	3.6	24.2	0.11	0.60	52.2
5	T1	1	0.0	0.418	3.8	LOS A	3.6	24.2	0.11	0.60	53.5
6	R2	613	3.3	0.418	8.9	LOS A	3.6	24.2	0.11	0.60	53.4
Approach		707	3.0	0.418	8.2	LOS A	3.6	24.2	0.11	0.60	53.2
North: Glenfield Road East											
7	L2	800	2.6	0.639	5.4	LOS A	6.3	42.3	0.66	0.61	53.5
8	T1	10	0.0	0.639	5.4	LOS A	6.3	42.3	0.66	0.61	55.0
9	R2	1	0.0	0.639	10.4	LOS A	6.3	42.3	0.66	0.61	55.0
Approach		811	2.6	0.639	5.4	LOS A	6.3	42.3	0.66	0.61	53.5
West: SW Railway Access											
10	L2	4	0.0	0.025	8.5	LOS A	0.1	1.0	0.72	0.63	51.9
11	T1	14	0.0	0.025	8.6	LOS A	0.1	1.0	0.72	0.63	53.2
12	R2	1	0.0	0.025	13.6	LOS A	0.1	1.0	0.72	0.63	53.2
Approach		19	0.0	0.025	8.8	LOS A	0.1	1.0	0.72	0.63	52.9
All Vehicles		1764	2.5	0.639	7.3	LOS A	6.3	42.3	0.44	0.62	53.1

Table B5.2.5 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Hurlstone Ag PM 2024 + SSD + Rezone

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Hurlstone Ag											
1	L2	1	0.0	0.256	7.8	LOS A	1.6	10.4	0.70	0.80	49.9
2	T1	40	0.0	0.256	7.8	LOS A	1.6	10.4	0.70	0.80	51.0
3	R2	186	1.1	0.256	12.9	LOS A	1.6	10.4	0.70	0.80	51.0
Approach		227	0.9	0.256	12.0	LOS A	1.6	10.4	0.70	0.80	51.0
East: Glenfield Road West											
4	L2	93	1.1	0.451	3.8	LOS A	4.2	28.9	0.12	0.59	52.2
5	T1	1	0.0	0.451	3.8	LOS A	4.2	28.9	0.12	0.59	53.4
6	R2	657	6.8	0.451	8.9	LOS A	4.2	28.9	0.12	0.59	53.2
Approach		751	6.1	0.451	8.3	LOS A	4.2	28.9	0.12	0.59	53.1
North: Glenfield Road East											
7	L2	899	5.1	0.724	6.0	LOS A	8.7	59.6	0.76	0.65	53.2
8	T1	10	0.0	0.724	6.1	LOS A	8.7	59.6	0.76	0.65	54.6
9	R2	1	0.0	0.724	11.1	LOS A	8.7	59.6	0.76	0.65	54.7
Approach		910	5.1	0.724	6.1	LOS A	8.7	59.6	0.76	0.65	53.2
West: SW Railway Access											
10	L2	4	0.0	0.026	9.2	LOS A	0.2	1.0	0.75	0.65	51.5
11	T1	14	0.0	0.026	9.2	LOS A	0.2	1.0	0.75	0.65	52.7
12	R2	1	0.0	0.026	14.2	LOS A	0.2	1.0	0.75	0.65	52.7
Approach		19	0.0	0.026	9.5	LOS A	0.2	1.0	0.75	0.65	52.4
All Vehicles		1907	4.9	0.724	7.7	LOS A	8.7	59.6	0.50	0.64	52.9

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B6

Intersection Glenfield Road & Brampton Avenue & Old Glenfield Road

SIDRA Report

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Table B6.1.1 AM 2014

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd AM 2014

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Brampton Avenue											
1	L2	129	1.6	0.217	31.5	LOS C	4.6	30.2	0.74	0.74	36.4
2	T1	1	0.0	0.217	27.0	LOS B	4.6	30.2	0.74	0.74	35.0
3	R2	108	0.9	0.235	32.2	LOS C	3.9	25.9	0.78	0.73	36.2
Approach		238	1.3	0.235	31.8	LOS C	4.6	30.2	0.76	0.73	36.3
East: Glenfield Road											
4	L2	29	0.0	0.287	26.1	LOS B	7.3	49.1	0.67	0.59	41.1
5	T1	587	3.6	0.474	22.4	LOS B	13.5	90.8	0.73	0.63	43.7
6	R2	2	0.0	0.005	16.6	LOS B	0.0	0.3	0.50	0.60	43.3
Approach		618	3.4	0.474	22.6	LOS B	13.5	90.8	0.72	0.63	43.6
North: Old Glenfield Road											
7	L2	1	0.0	0.005	37.6	LOS C	0.1	0.5	0.78	0.55	35.1
8	T1	1	0.0	0.005	33.1	LOS C	0.1	0.5	0.78	0.55	33.7
9	R2	3	0.0	0.007	29.4	LOS C	0.1	0.6	0.72	0.60	37.4
Approach		5	0.0	0.007	31.7	LOS C	0.1	0.6	0.75	0.58	36.1
West: Glenfield Road											
10	L2	3	33.3	0.394	27.7	LOS B	10.6	71.4	0.71	0.62	40.5
11	T1	870	3.0	0.710	24.7	LOS B	21.9	146.7	0.80	0.71	42.7
12	R2	36	11.1	0.077	17.4	LOS B	0.8	6.0	0.52	0.66	42.9
Approach		909	3.4	0.710	24.4	LOS B	21.9	146.7	0.79	0.70	42.7
All Vehicles		1770	3.1	0.710	24.8	LOS B	21.9	146.7	0.76	0.68	42.0

Table B6.1.2 AM 2024

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd AM 2024

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	218	0.9	0.362	33.1	LOS C	8.1	53.5	0.79	0.77	35.9
2	T1	1	0.0	0.362	28.6	LOS C	8.1	53.5	0.79	0.77	34.4
3	R2	76	1.3	0.170	31.7	LOS C	2.7	18.0	0.76	0.71	36.4
Approach		295	1.0	0.362	32.8	LOS C	8.1	53.5	0.78	0.75	36.0
East: Glenfield Road											
4	L2	25	0.0	0.317	25.8	LOS B	8.3	55.5	0.67	0.59	41.4
5	T1	672	3.3	0.523	22.2	LOS B	15.5	104.0	0.74	0.64	43.9
6	R2	12	0.0	0.031	17.0	LOS B	0.3	1.8	0.51	0.63	43.2
Approach		709	3.1	0.523	22.3	LOS B	15.5	104.0	0.73	0.64	43.8
North: Old Glenfield Road											
7	L2	30	0.0	0.053	30.4	LOS C	1.0	6.7	0.70	0.67	36.9
8	T1	1	0.0	0.053	25.9	LOS B	1.0	6.7	0.70	0.67	35.4
9	R2	32	0.0	0.078	30.7	LOS C	1.1	7.2	0.74	0.67	36.9
Approach		63	0.0	0.078	30.5	LOS C	1.1	7.2	0.72	0.67	36.9
West: Glenfield Road											
10	L2	13	7.7	0.427	27.1	LOS B	11.9	79.5	0.72	0.63	40.8
11	T1	937	2.9	0.769	24.5	LOS B	23.9	159.6	0.81	0.72	42.8
12	R2	75	5.3	0.168	17.8	LOS B	1.8	12.4	0.54	0.68	42.7
Approach		1025	3.1	0.769	24.1	LOS B	23.9	159.6	0.79	0.72	42.7
All Vehicles		2092	2.7	0.769	24.9	LOS B	23.9	159.6	0.77	0.70	41.8

Table B6.1.3 AM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd AM 2024 + Rezone

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	218	0.9	0.373	34.0	LOS C	8.3	54.3	0.80	0.77	35.5
2	T1	1	0.0	0.373	29.4	LOS C	8.3	54.3	0.80	0.77	34.1
3	R2	76	1.3	0.177	32.8	LOS C	2.8	18.5	0.77	0.71	36.0
Approach		295	1.0	0.373	33.7	LOS C	8.3	54.3	0.79	0.76	35.7
East: Glenfield Road											
4	L2	25	0.0	0.330	24.6	LOS B	8.7	59.7	0.66	0.58	41.9
5	T1	713	6.3	0.545	21.1	LOS B	16.1	110.9	0.72	0.64	44.5
6	R2	12	0.0	0.035	16.6	LOS B	0.3	1.7	0.50	0.63	43.4
Approach		750	6.0	0.545	21.1	LOS B	16.1	110.9	0.72	0.64	44.4
North: Old Glenfield Road											
7	L2	30	0.0	0.054	31.2	LOS C	1.1	6.8	0.71	0.68	36.6
8	T1	1	0.0	0.054	26.7	LOS B	1.1	6.8	0.71	0.68	35.1
9	R2	32	0.0	0.082	31.7	LOS C	1.1	7.4	0.75	0.67	36.5
Approach		63	0.0	0.082	31.4	LOS C	1.1	7.4	0.73	0.67	36.5
West: Glenfield Road											
10	L2	13	7.7	0.469	26.3	LOS B	13.4	91.8	0.72	0.63	41.2
11	T1	1033	4.9	0.844	23.7	LOS B	26.0	177.2	0.82	0.73	43.2
12	R2	75	5.3	0.178	17.4	LOS B	1.8	12.2	0.53	0.68	42.9
Approach		1121	5.0	0.844	23.3	LOS B	26.0	177.2	0.80	0.72	43.1
All Vehicles		2229	4.7	0.844	24.2	LOS B	26.0	177.2	0.77	0.70	42.1

Table B6.1.4 AM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd AM 2024 + SSD

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	218	0.9	0.362	33.1	LOS C	8.1	53.5	0.79	0.77	35.9
2	T1	1	0.0	0.362	28.6	LOS C	8.1	53.5	0.79	0.77	34.4
3	R2	76	1.3	0.170	31.7	LOS C	2.7	18.0	0.76	0.71	36.4
Approach		295	1.0	0.362	32.8	LOS C	8.1	53.5	0.78	0.75	36.0
East: Glenfield Road											
4	L2	25	0.0	0.318	25.8	LOS B	8.3	55.9	0.67	0.59	41.4
5	T1	674	3.7	0.526	22.3	LOS B	15.6	105.0	0.74	0.65	43.8
6	R2	12	0.0	0.031	17.0	LOS B	0.3	1.8	0.51	0.63	43.2
Approach		711	3.5	0.526	22.3	LOS B	15.6	105.0	0.73	0.64	43.7
North: Old Glenfield Road											
7	L2	30	0.0	0.053	30.4	LOS C	1.0	6.7	0.70	0.67	36.9
8	T1	1	0.0	0.053	25.9	LOS B	1.0	6.7	0.70	0.67	35.4
9	R2	32	0.0	0.078	30.7	LOS C	1.1	7.2	0.74	0.67	36.9
Approach		63	0.0	0.078	30.5	LOS C	1.1	7.2	0.72	0.67	36.9
West: Glenfield Road											
10	L2	13	7.7	0.430	27.1	LOS B	11.9	80.1	0.72	0.63	40.8
11	T1	941	3.1	0.773	24.6	LOS B	24.0	161.0	0.81	0.72	42.7
12	R2	75	5.3	0.169	17.8	LOS B	1.8	12.4	0.54	0.68	42.7
Approach		1029	3.3	0.773	24.1	LOS B	24.0	161.0	0.79	0.72	42.7
All Vehicles		2098	3.0	0.773	24.9	LOS B	24.0	161.0	0.77	0.70	41.7

Table B6.1.5 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd AM 2024 + Rezone + SSD

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	218	0.9	0.373	34.0	LOS C	8.3	54.3	0.80	0.77	35.5
2	T1	1	0.0	0.373	29.4	LOS C	8.3	54.3	0.80	0.77	34.1
3	R2	76	1.3	0.177	32.8	LOS C	2.8	18.5	0.77	0.71	36.0
Approach		295	1.0	0.373	33.7	LOS C	8.3	54.3	0.79	0.76	35.7
East: Glenfield Road											
4	L2	25	0.0	0.331	24.6	LOS B	8.7	60.1	0.66	0.58	41.9
5	T1	715	6.7	0.547	21.1	LOS B	16.1	111.9	0.72	0.64	44.5
6	R2	12	0.0	0.035	16.6	LOS B	0.3	1.7	0.50	0.63	43.4
Approach		752	6.4	0.547	21.2	LOS B	16.1	111.9	0.72	0.64	44.4
North: Old Glenfield Road											
7	L2	30	0.0	0.054	31.2	LOS C	1.1	6.8	0.71	0.68	36.6
8	T1	1	0.0	0.054	26.7	LOS B	1.1	6.8	0.71	0.68	35.1
9	R2	32	0.0	0.082	31.7	LOS C	1.1	7.4	0.75	0.67	36.5
Approach		63	0.0	0.082	31.4	LOS C	1.1	7.4	0.73	0.67	36.5
West: Glenfield Road											
10	L2	13	7.7	0.472	26.4	LOS B	13.5	92.5	0.72	0.64	41.2
11	T1	1037	5.1	0.849	23.7	LOS B	26.1	178.5	0.82	0.73	43.2
12	R2	75	5.3	0.178	17.4	LOS B	1.8	12.2	0.53	0.68	42.9
Approach		1125	5.2	0.849	23.4	LOS B	26.1	178.5	0.80	0.73	43.1
All Vehicles		2235	4.9	0.849	24.2	LOS B	26.1	178.5	0.77	0.70	42.1

Table B6.2.1 PM 2014

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd PM 2014

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	57	3.5	0.092	28.7	LOS C	1.9	12.7	0.68	0.69	37.5
2	T1	1	0.0	0.092	24.1	LOS B	1.9	12.7	0.68	0.69	36.0
3	R2	22	0.0	0.043	27.7	LOS B	0.7	4.6	0.70	0.66	37.9
Approach		80	2.5	0.092	28.4	LOS B	1.9	12.7	0.69	0.68	37.6
East: Glenfield Road											
4	L2	24	0.0	0.337	30.1	LOS C	8.3	55.8	0.73	0.64	39.4
5	T1	614	3.3	0.556	26.8	LOS B	15.4	103.2	0.79	0.69	41.6
6	R2	1	0.0	0.002	18.0	LOS B	0.0	0.2	0.53	0.59	42.7
Approach		639	3.1	0.556	26.9	LOS B	15.4	103.2	0.79	0.69	41.5
North: Old Glenfield Road											
7	L2	2	0.0	0.006	35.2	LOS C	0.1	0.7	0.75	0.57	35.7
8	T1	1	0.0	0.006	30.6	LOS C	0.1	0.7	0.75	0.57	34.3
9	R2	5	20.0	0.011	27.5	LOS B	0.2	1.2	0.70	0.61	37.8
Approach		8	12.5	0.011	29.8	LOS C	0.2	1.2	0.72	0.60	36.8
West: Glenfield Road											
10	L2	6	0.0	0.275	29.4	LOS C	6.6	44.4	0.71	0.60	39.9
11	T1	540	4.3	0.495	26.0	LOS B	13.2	89.4	0.77	0.66	42.0
12	R2	87	1.1	0.176	19.3	LOS B	2.2	14.5	0.57	0.69	42.0
Approach		633	3.8	0.495	25.1	LOS B	13.2	89.4	0.74	0.66	42.0
All Vehicles		1360	3.5	0.556	26.2	LOS B	15.4	103.2	0.76	0.68	41.5

Table B6.2.2 PM 2024

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd PM 2024

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	75	2.7	0.122	29.0	LOS C	2.5	16.7	0.69	0.71	37.3
2	T1	1	0.0	0.122	24.4	LOS B	2.5	16.7	0.69	0.71	35.8
3	R2	24	0.0	0.049	28.7	LOS C	0.8	5.1	0.72	0.66	37.5
Approach		100	2.0	0.122	28.9	LOS C	2.5	16.7	0.70	0.70	37.4
East: Glenfield Road											
4	L2	71	0.0	0.370	29.1	LOS C	9.6	63.9	0.73	0.66	39.5
5	T1	653	3.1	0.610	25.9	LOS B	17.1	114.6	0.80	0.70	41.9
6	R2	29	0.0	0.060	18.2	LOS B	0.7	4.5	0.54	0.66	42.6
Approach		753	2.7	0.610	25.9	LOS B	17.1	114.6	0.78	0.70	41.7
North: Old Glenfield Road											
7	L2	12	0.0	0.022	30.0	LOS C	0.4	2.8	0.69	0.64	37.1
8	T1	1	0.0	0.022	25.4	LOS B	0.4	2.8	0.69	0.64	35.6
9	R2	15	6.7	0.033	28.5	LOS C	0.5	3.4	0.71	0.64	37.6
Approach		28	3.6	0.033	29.0	LOS C	0.5	3.4	0.70	0.64	37.3
West: Glenfield Road											
10	L2	35	0.0	0.319	28.5	LOS B	8.0	53.9	0.71	0.63	40.0
11	T1	637	3.8	0.575	25.6	LOS B	16.5	111.5	0.79	0.69	42.1
12	R2	214	0.5	0.459	20.1	LOS B	5.8	37.9	0.62	0.73	41.6
Approach		886	2.8	0.575	24.4	LOS B	16.5	111.5	0.74	0.70	41.9
All Vehicles		1767	2.7	0.610	25.3	LOS B	17.1	114.6	0.76	0.70	41.5

Table B6.2.3 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd PM 2024 + Rezone

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	75	2.7	0.125	29.8	LOS C	2.5	17.0	0.70	0.71	37.1
2	T1	1	0.0	0.125	25.2	LOS B	2.5	17.0	0.70	0.71	35.6
3	R2	24	0.0	0.051	29.5	LOS C	0.8	5.3	0.73	0.66	37.2
Approach		100	2.0	0.125	29.7	LOS C	2.5	17.0	0.71	0.70	37.1
East: Glenfield Road											
4	L2	71	0.0	0.407	28.1	LOS B	10.9	74.1	0.73	0.66	39.9
5	T1	754	6.2	0.673	25.3	LOS B	19.8	136.8	0.81	0.72	42.2
6	R2	29	0.0	0.063	17.7	LOS B	0.7	4.4	0.53	0.66	42.8
Approach		854	5.5	0.673	25.2	LOS B	19.8	136.8	0.79	0.71	42.0
North: Old Glenfield Road											
7	L2	12	0.0	0.023	30.8	LOS C	0.4	2.8	0.70	0.64	36.8
8	T1	1	0.0	0.023	26.2	LOS B	0.4	2.8	0.70	0.64	35.3
9	R2	15	6.7	0.034	29.4	LOS C	0.5	3.5	0.72	0.65	37.3
Approach		28	3.6	0.034	29.9	LOS C	0.5	3.5	0.71	0.64	37.0
West: Glenfield Road											
10	L2	35	0.0	0.331	27.3	LOS B	8.4	58.1	0.70	0.62	40.5
11	T1	682	7.3	0.596	24.5	LOS B	17.5	122.1	0.78	0.69	42.7
12	R2	214	0.5	0.504	19.6	LOS B	5.7	37.4	0.61	0.73	41.9
Approach		931	5.5	0.596	23.4	LOS B	17.5	122.1	0.74	0.69	42.4
All Vehicles		1913	5.3	0.673	24.7	LOS B	19.8	136.8	0.76	0.70	41.8

Table B6.2.4 PM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd PM 2024 + SSD

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	75	2.7	0.122	29.0	LOS C	2.5	16.7	0.69	0.71	37.3
2	T1	1	0.0	0.122	24.4	LOS B	2.5	16.7	0.69	0.71	35.8
3	R2	24	0.0	0.049	28.7	LOS C	0.8	5.1	0.72	0.66	37.5
Approach		100	2.0	0.122	28.9	LOS C	2.5	16.7	0.70	0.70	37.4
East: Glenfield Road											
4	L2	71	0.0	0.371	29.1	LOS C	9.6	64.2	0.73	0.66	39.5
5	T1	655	3.2	0.613	25.9	LOS B	17.2	115.2	0.80	0.71	41.9
6	R2	29	0.0	0.060	18.2	LOS B	0.7	4.5	0.54	0.66	42.6
Approach		755	2.8	0.613	25.9	LOS B	17.2	115.2	0.78	0.70	41.7
North: Old Glenfield Road											
7	L2	12	0.0	0.022	30.0	LOS C	0.4	2.8	0.69	0.64	37.1
8	T1	1	0.0	0.022	25.4	LOS B	0.4	2.8	0.69	0.64	35.6
9	R2	15	6.7	0.033	28.5	LOS C	0.5	3.4	0.71	0.64	37.6
Approach		28	3.6	0.033	29.0	LOS C	0.5	3.4	0.70	0.64	37.3
West: Glenfield Road											
10	L2	35	0.0	0.320	28.5	LOS C	8.0	54.0	0.71	0.63	40.0
11	T1	637	3.9	0.576	25.6	LOS B	16.5	111.7	0.79	0.69	42.1
12	R2	214	0.5	0.460	20.1	LOS B	5.8	37.9	0.62	0.73	41.6
Approach		886	2.9	0.576	24.4	LOS B	16.5	111.7	0.74	0.70	41.9
All Vehicles		1769	2.8	0.613	25.4	LOS B	17.2	115.2	0.76	0.70	41.5

Table B6.2.5 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Glenfield Rd & Brampton Ave & Old Glenfield Rd PM 2024 + SSD + Rezone

Signals - Actuated Cycle Time = 100 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brampton Avenue											
1	L2	75	2.7	0.125	29.8	LOS C	2.5	17.0	0.70	0.71	37.1
2	T1	1	0.0	0.125	25.2	LOS B	2.5	17.0	0.70	0.71	35.6
3	R2	24	0.0	0.051	29.5	LOS C	0.8	5.3	0.73	0.66	37.2
Approach		100	2.0	0.125	29.7	LOS C	2.5	17.0	0.71	0.70	37.1
East: Glenfield Road											
4	L2	71	0.0	0.408	28.1	LOS B	10.9	74.1	0.73	0.66	39.9
5	T1	755	6.1	0.673	25.3	LOS B	19.8	136.9	0.81	0.72	42.2
6	R2	29	0.0	0.063	17.7	LOS B	0.7	4.4	0.53	0.66	42.8
Approach		855	5.4	0.673	25.3	LOS B	19.8	136.9	0.79	0.71	42.0
North: Old Glenfield Road											
7	L2	12	0.0	0.023	30.8	LOS C	0.4	2.8	0.70	0.64	36.8
8	T1	1	0.0	0.023	26.2	LOS B	0.4	2.8	0.70	0.64	35.3
9	R2	15	6.7	0.034	29.4	LOS C	0.5	3.5	0.72	0.65	37.3
Approach		28	3.6	0.034	29.9	LOS C	0.5	3.5	0.71	0.64	37.0
West: Glenfield Road											
10	L2	35	0.0	0.332	27.3	LOS B	8.4	58.2	0.70	0.62	40.5
11	T1	682	7.5	0.597	24.5	LOS B	17.5	122.3	0.78	0.69	42.7
12	R2	214	0.5	0.504	19.6	LOS B	5.7	37.4	0.61	0.73	41.9
Approach		931	5.6	0.597	23.4	LOS B	17.5	122.3	0.74	0.69	42.4
All Vehicles		1914	5.3	0.673	24.7	LOS B	19.8	136.9	0.76	0.70	41.8

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B7

Intersection Campbelltown Road & Glenfield Road

SIDRA Report

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Table B7.1.1 AM 2014

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd AM 2014

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	768	5.2	0.255	20.4	LOS B	10.0	68.4	0.58	0.50	50.4
3	R2	131	3.1	0.446	68.6	LOS E	8.8	58.7	0.95	0.80	29.2
Approach		899	4.9	0.446	27.4	LOS B	10.0	68.4	0.64	0.55	45.6
East: GLENFIELD RD											
4	L2	73	8.2	0.041	5.7	LOS A	0.0	0.0	0.00	0.52	54.6
6	R2	613	2.9	0.453	40.8	LOS C	17.5	116.8	0.78	0.80	36.6
Approach		686	3.5	0.453	37.1	LOS C	17.5	116.8	0.70	0.77	37.9
North: CAMPBELLTOWN RD - NORTH											
7	L2	755	3.7	0.543	8.5	LOS A	11.1	74.8	0.29	0.68	55.4
8	T1	811	10.6	0.449	41.0	LOS C	13.7	98.9	0.75	0.64	39.3
Approach		1566	7.3	0.543	25.3	LOS B	13.7	98.9	0.53	0.66	45.7
All Vehicles		3151	5.8	0.543	28.5	LOS B	17.5	116.8	0.60	0.65	43.7

Table B7.1.2 AM 2024

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd AM 2024

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	1826	2.6	0.575	23.7	LOS B	28.8	192.2	0.71	0.65	48.2
3	R2	148	2.7	0.574	72.6	LOS F	10.3	68.8	0.99	0.81	28.2
Approach		1974	2.6	0.575	27.3	LOS B	28.8	192.2	0.73	0.66	45.8
East: GLENFIELD RD											
4	L2	93	6.5	0.087	8.9	LOS A	1.4	9.7	0.26	0.62	52.8
6	R2	793	2.4	0.576	45.5	LOS D	22.9	152.4	0.86	0.83	35.0
Approach		886	2.8	0.576	41.7	LOS C	22.9	152.4	0.79	0.81	36.3
North: CAMPBELLTOWN RD - NORTH											
7	L2	853	3.4	0.611	9.2	LOS A	16.2	108.7	0.36	0.71	54.8
8	T1	1133	14.8	0.573	37.7	LOS C	19.4	145.0	0.76	0.67	40.8
Approach		1986	9.9	0.611	25.4	LOS B	19.4	145.0	0.59	0.68	45.8
All Vehicles		4846	5.6	0.611	29.2	LOS C	28.8	192.2	0.69	0.70	43.7

Table B7.1.3 AM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd AM 2024 + REZONE

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	1826	2.6	0.568	23.0	LOS B	28.4	189.3	0.70	0.64	48.7
3	R2	169	5.3	0.584	70.3	LOS E	11.6	79.5	0.98	0.82	28.7
Approach		1995	2.8	0.584	27.0	LOS B	28.4	189.3	0.73	0.65	46.0
East: GLENFIELD RD											
4	L2	120	17.5	0.120	9.4	LOS A	1.9	14.8	0.28	0.62	50.2
6	R2	807	3.3	0.600	46.7	LOS D	23.7	159.4	0.87	0.84	34.5
Approach		927	5.2	0.600	41.9	LOS C	23.7	159.4	0.79	0.81	36.0
North: CAMPBELLTOWN RD - NORTH											
7	L2	928	5.2	0.684	10.0	LOS A	21.9	149.5	0.44	0.73	54.1
8	T1	1133	14.8	0.595	39.8	LOS C	20.1	150.2	0.79	0.69	39.8
Approach		2061	10.5	0.684	26.4	LOS B	21.9	150.2	0.63	0.71	45.2
All Vehicles		4983	6.4	0.684	29.5	LOS C	28.4	189.3	0.70	0.71	43.4

Table B7.1.4 AM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd AM 2024 + SSD

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	1826	2.6	0.575	23.7	LOS B	28.8	192.2	0.71	0.65	48.2
3	R2	148	2.7	0.574	72.6	LOS F	10.3	68.8	0.99	0.81	28.2
Approach		1974	2.6	0.575	27.3	LOS B	28.8	192.2	0.73	0.66	45.8
East: GLENFIELD RD											
4	L2	94	7.4	0.089	8.9	LOS A	1.4	9.9	0.26	0.62	52.6
6	R2	795	2.6	0.578	45.6	LOS D	23.0	153.3	0.86	0.83	35.0
Approach		889	3.1	0.578	41.7	LOS C	23.0	153.3	0.79	0.81	36.2
North: CAMPBELLTOWN RD - NORTH											
7	L2	857	3.6	0.615	9.2	LOS A	16.4	110.2	0.37	0.71	54.8
8	T1	1133	14.8	0.573	37.7	LOS C	19.4	145.0	0.76	0.67	40.8
Approach		1990	10.0	0.615	25.4	LOS B	19.4	145.0	0.59	0.68	45.8
All Vehicles		4853	5.7	0.615	29.2	LOS C	28.8	192.2	0.69	0.70	43.7

Table B7.1.5 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd AM 2024 + SSD + REZONE

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	1826	2.6	0.568	23.0	LOS B	28.4	189.3	0.70	0.64	48.7
3	R2	169	5.3	0.584	70.3	LOS E	11.6	79.5	0.98	0.82	28.7
Approach		1995	2.8	0.584	27.0	LOS B	28.4	189.3	0.73	0.65	46.0
East: GLENFIELD RD											
4	L2	121	18.2	0.121	9.4	LOS A	2.0	15.1	0.28	0.62	50.0
6	R2	810	3.7	0.604	46.8	LOS D	23.9	160.9	0.87	0.84	34.5
Approach		931	5.6	0.604	41.9	LOS C	23.9	160.9	0.80	0.81	35.9
North: CAMPBELLTOWN RD - NORTH											
7	L2	932	5.4	0.688	10.0	LOS A	22.2	151.8	0.45	0.74	54.1
8	T1	1133	14.8	0.595	39.8	LOS C	20.1	150.2	0.79	0.69	39.8
Approach		2065	10.6	0.688	26.4	LOS B	22.2	151.8	0.63	0.71	45.2
All Vehicles		4991	6.5	0.688	29.5	LOS C	28.4	189.3	0.70	0.71	43.4

Table B7.2.1 PM 2014

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd PM 2014

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	376	5.3	0.105	11.7	LOS A	3.6	24.3	0.42	0.35	57.3
3	R2	80	1.3	0.538	80.7	LOS F	5.8	38.5	1.00	0.77	26.6
Approach		456	4.6	0.538	23.8	LOS B	5.8	38.5	0.52	0.42	47.6
East: GLENFIELD RD											
4	L2	132	1.5	0.071	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
6	R2	543	3.1	0.572	52.8	LOS D	19.0	127.5	0.89	0.82	32.7
Approach		675	2.8	0.572	43.6	LOS D	19.0	127.5	0.71	0.76	35.5
North: CAMPBELLTOWN RD - NORTH											
7	L2	559	4.7	0.375	7.6	LOS A	5.1	35.0	0.20	0.65	56.1
8	T1	1637	4.9	0.564	20.4	LOS B	20.5	140.1	0.57	0.51	50.4
Approach		2196	4.9	0.564	17.2	LOS B	20.5	140.1	0.47	0.54	51.7
All Vehicles		3327	4.4	0.572	23.4	LOS B	20.5	140.1	0.53	0.57	46.8

Table B7.2.2 PM 2024

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd PM 2024

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	749	2.9	0.178	6.7	LOS A	5.6	37.2	0.34	0.29	62.1
3	R2	113	0.9	0.826	88.6	LOS F	8.9	58.5	1.00	0.90	25.1
Approach		862	2.7	0.826	17.4	LOS B	8.9	58.5	0.42	0.37	52.0
East: GLENFIELD RD											
4	L2	145	1.4	0.247	20.8	LOS B	5.4	35.6	0.57	0.73	45.9
6	R2	597	3.0	0.840	75.4	LOS F	22.8	152.6	1.00	0.92	27.2
Approach		742	2.7	0.840	64.8	LOS E	22.8	152.6	0.92	0.88	29.6
North: CAMPBELLTOWN RD - NORTH											
7	L2	780	3.5	0.515	8.3	LOS A	10.9	73.3	0.28	0.67	55.6
8	T1	2703	6.8	0.779	12.3	LOS A	32.4	224.9	0.55	0.51	56.7
Approach		3483	6.1	0.779	11.4	LOS A	32.4	224.9	0.49	0.55	56.5
All Vehicles		5087	5.0	0.840	20.2	LOS B	32.4	224.9	0.54	0.57	49.2

Table B7.2.3 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd PM 2024 + REZONE

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	749	2.9	0.179	7.0	LOS A	5.7	38.1	0.34	0.30	61.7
3	R2	124	6.5	0.864	91.0	LOS F	10.0	69.3	1.00	0.94	24.7
Approach		873	3.4	0.864	19.0	LOS B	10.0	69.3	0.44	0.39	50.9
East: GLENFIELD RD											
4	L2	211	8.5	0.364	26.0	LOS B	9.6	68.1	0.69	0.78	42.1
6	R2	632	4.4	0.869	78.3	LOS F	24.9	169.2	1.00	0.95	26.6
Approach		843	5.5	0.869	65.2	LOS E	24.9	169.2	0.92	0.91	29.3
North: CAMPBELLTOWN RD - NORTH											
7	L2	814	5.7	0.551	8.8	LOS A	13.5	92.6	0.32	0.69	55.1
8	T1	2703	6.8	0.796	13.9	LOS A	35.6	247.0	0.60	0.56	55.3
Approach		3517	6.5	0.796	12.8	LOS A	35.6	247.0	0.54	0.59	55.3
All Vehicles		5233	5.8	0.869	22.2	LOS B	35.6	247.0	0.58	0.61	47.7

Table B7.2.4 PM 2024 + SSD Proposal

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd PM 2024 + SSD

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	749	2.9	0.178	6.7	LOS A	5.6	37.2	0.34	0.29	62.1
3	R2	113	0.9	0.826	88.6	LOS F	8.9	58.5	1.00	0.90	25.1
Approach		862	2.7	0.826	17.4	LOS B	8.9	58.5	0.42	0.37	52.0
East: GLENFIELD RD											
4	L2	146	1.4	0.249	20.9	LOS B	5.4	35.9	0.57	0.73	45.9
6	R2	597	2.8	0.840	75.3	LOS F	22.8	152.2	1.00	0.92	27.2
Approach		743	2.6	0.840	64.6	LOS E	22.8	152.2	0.92	0.88	29.6
North: CAMPBELLTOWN RD - NORTH											
7	L2	780	3.6	0.515	8.3	LOS A	10.9	73.5	0.28	0.67	55.6
8	T1	2703	6.8	0.779	12.3	LOS A	32.4	224.9	0.55	0.51	56.7
Approach		3483	6.1	0.779	11.4	LOS A	32.4	224.9	0.49	0.55	56.5
All Vehicles		5088	5.0	0.840	20.2	LOS B	32.4	224.9	0.54	0.57	49.2

Table B7.2.5 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: Campbelltown Rd & Glenfield Rd PM 2024 + SSD + REZONE

Signals - Fixed Time Cycle Time = 150 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: CAMPBELLTOWN RD - SOUTH											
2	T1	749	2.9	0.179	7.0	LOS A	5.7	38.1	0.34	0.30	61.7
3	R2	124	6.5	0.864	91.0	LOS F	10.0	69.3	1.00	0.94	24.7
Approach		873	3.4	0.864	19.0	LOS B	10.0	69.3	0.44	0.39	50.9
East: GLENFIELD RD											
4	L2	211	8.5	0.364	26.0	LOS B	9.6	68.1	0.69	0.78	42.1
6	R2	633	4.4	0.870	78.5	LOS F	25.0	169.7	1.00	0.95	26.5
Approach		844	5.5	0.870	65.4	LOS E	25.0	169.7	0.92	0.91	29.2
North: CAMPBELLTOWN RD - NORTH											
7	L2	814	5.8	0.551	8.8	LOS A	13.5	92.8	0.32	0.69	55.1
8	T1	2703	6.8	0.796	13.9	LOS A	35.6	247.0	0.60	0.56	55.3
Approach		3517	6.6	0.796	12.8	LOS A	35.6	247.0	0.54	0.59	55.3
All Vehicles		5234	5.9	0.870	22.3	LOS B	35.6	247.0	0.58	0.61	47.7

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix B8

Intersection Cambridge Avenue & GWS Road 3

SIDRA Report

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Table B8.1.1 AM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: GWS 3 & CR AM 2024 + Rezone

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	271	4.8	0.123	2.5	LOS A	0.9	6.2	0.25	0.37	54.4
6	R2	63	11.1	0.123	8.0	LOS A	0.9	6.2	0.25	0.38	52.6
Approach		334	6.0	0.123	4.0	LOS A	0.9	6.2	0.25	0.37	54.1
North: GWS Road 3											
7	L2	21	33.3	0.051	7.7	LOS A	0.2	2.0	0.75	0.70	36.3
9	R2	53	50.9	0.097	8.2	LOS A	0.5	4.7	0.77	0.79	36.2
Approach		74	45.9	0.097	8.1	LOS A	0.5	4.7	0.76	0.77	36.2
West: Cambridge Avenue											
10	L2	130	20.8	0.386	3.4	LOS A	3.1	21.5	0.30	0.34	52.0
11	T1	1381	2.9	0.543	4.0	LOS A	5.4	36.0	0.32	0.36	55.9
Approach		1511	4.4	0.543	3.6	LOS A	5.4	36.0	0.32	0.36	55.5
All Vehicles		1919	6.3	0.543	4.0	LOS A	5.4	36.0	0.32	0.38	54.1

Table B8.1.2 AM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: GWS 3 & CR AM + Rezone + SSD

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	265	3.4	0.121	2.4	LOS A	0.9	6.0	0.25	0.37	54.4
6	R2	63	11.1	0.121	7.9	LOS A	0.9	6.0	0.24	0.38	52.5
Approach		328	4.9	0.121	4.0	LOS A	0.9	6.0	0.25	0.37	54.0
North: GWS Road 3											
7	L2	21	33.3	0.051	7.8	LOS A	0.2	2.0	0.76	0.71	36.2
9	R2	53	50.9	0.099	8.4	LOS A	0.5	4.8	0.77	0.80	36.1
Approach		74	45.9	0.099	8.2	LOS A	0.5	4.8	0.77	0.77	36.1
West: Cambridge Avenue											
10	L2	130	20.8	0.392	3.4	LOS A	3.1	22.0	0.31	0.34	52.0
11	T1	1397	3.5	0.550	4.0	LOS A	5.5	37.1	0.32	0.36	55.8
Approach		1527	5.0	0.550	3.7	LOS A	5.5	37.1	0.32	0.36	55.5
All Vehicles		1929	6.5	0.550	4.0	LOS A	5.5	37.1	0.32	0.38	54.1

Table B8.2.1 PM 2024 + Rezoning Proposal

MOVEMENT SUMMARY

Site: GWS 3 & CR PM 2024 + Rezone

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	1351	3.1	0.534	4.4	LOS A	5.2	35.4	0.49	0.44	55.6
6	R2	21	33.3	0.534	10.3	LOS A	5.2	35.4	0.50	0.44	54.6
Approach		1372	3.6	0.534	4.5	LOS A	5.2	35.4	0.49	0.44	55.5
North: GWS Road 3											
7	L2	65	10.8	0.071	1.6	LOS A	0.3	2.2	0.46	0.31	38.7
9	R2	135	20.7	0.120	3.4	LOS A	0.6	4.4	0.45	0.47	38.1
Approach		200	17.5	0.120	2.8	LOS A	0.6	4.4	0.45	0.42	38.3
West: Cambridge Avenue											
10	L2	55	50.9	0.109	2.7	LOS A	0.7	5.4	0.14	0.26	50.4
11	T1	379	1.3	0.153	3.6	LOS A	1.1	7.1	0.13	0.32	56.5
Approach		434	7.6	0.153	3.1	LOS A	1.1	7.1	0.14	0.31	55.7
All Vehicles		2006	5.8	0.534	4.1	LOS A	5.2	35.4	0.41	0.41	53.2

Table B8.2.2 PM 2024 + Rezoning Proposal + SSD Proposal

MOVEMENT SUMMARY

Site: GWS 3 & CR PM 2024 + Rezone + SSD

Roundabout

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Cambridge Avenue											
5	T1	1346	3.0	0.591	4.4	LOS A	5.5	36.9	0.48	0.45	55.6
6	R2	21	33.3	0.591	10.4	LOS A	5.5	36.9	0.51	0.44	54.5
Approach		1367	3.4	0.591	4.6	LOS A	5.5	36.9	0.48	0.45	55.6
North: GWS Road 3											
7	L2	65	10.8	0.071	1.7	LOS A	0.3	2.2	0.46	0.31	38.7
9	R2	135	20.7	0.121	3.4	LOS A	0.6	4.4	0.45	0.47	38.1
Approach		200	17.5	0.121	2.8	LOS A	0.6	4.4	0.45	0.42	38.3
West: Cambridge Avenue											
10	L2	55	50.9	0.122	2.7	LOS A	0.7	5.3	0.13	0.26	50.6
11	T1	386	1.8	0.172	3.6	LOS A	1.0	6.9	0.12	0.32	56.6
Approach		441	7.9	0.172	3.1	LOS A	1.0	6.9	0.12	0.31	55.8
All Vehicles		2008	5.8	0.591	4.1	LOS A	5.5	36.9	0.40	0.41	53.2

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix C RMS Crash Data

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Table 2.2 Summary Crash Report 2008 - 2013

Table 1.1 Cambridge Avenue Detailed Crash Report 2008 - 2013

Detailed Crash Report

Transport for NSW — Centre for Road Safety

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
																					S F
Sydney Region																					
Campbelltown LGA																					
Glenfield																					
Cambridge Ave																					
656716	06/02/2009	Fri	07:00	200 m	E	CANTERBURY RD	2WY	STR	Fine	Dry	60	2	CAR	U U	W in CAMBRIDGE AVE	Unk Incorrect side		I	0	1	F
E36581531							RUM: 20	Head on					M/C	M53	E in CAMBRIDGE AVE	Unk Proceeding in lane					
779226	07/10/2011	Fri	16:10	200 m	E	CANTERBURY RD	2WY	STR	Overcast	Dry	60	1	CAR	F50	W in CAMBRIDGE AVE	55 Proceeding in lane		I	0	1	F
E46283829							RUM: 71	Off rd left => obj					Signpost								
816178	18/10/2012	Thu	20:11	200 m	E	CANTERBURY RD	2WY	STR	Fine	Dry	60	2	OMV	U U	E in CAMBRIDGE AVE	Unk Incorrect side		I	0	1	F
E49910369							RUM: 20	Head on					4WD	M20	W in CAMBRIDGE AVE	60 Proceeding in lane					
644883	07/11/2008	Fri	17:10	300 m	E	CANTERBURY RD	2WY	STR	Fine	Dry	60	3	CAR	F26	W in CAMBRIDGE AVE	10 Proceeding in lane		N	0	0	
E35886151							RUM: 30	Rear end					CAR	F36	W in CAMBRIDGE AVE	5 Proceeding in lane					
													CAR	M21	W in CAMBRIDGE AVE	5 Proceeding in lane					
677862	08/08/2009	Sat	11:00	500 m	E	CANTERBURY RD	2WY	STR	Fine	Dry	70	2	WAG	F61	E in CAMBRIDGE AVE	50 Perform U-turn		I	0	1	
E38478658							RUM: 40	U turn					CAR	M42	E in CAMBRIDGE AVE	60 Proceeding in lane					
734443	27/11/2010	Sat	02:42	25 m	W	GEORGES RIVER BDGE	2WY	STR	Fine	Dry	60	1	CAR	F36	E in CAMBRIDGE AVE	100 Proceeding in lane		I	0	1	S
E43044162							RUM: 73	Off rd rght => obj					Other fixed object								
Canterbury Rd																					
689955	17/11/2009	Tue	06:06		at	CAMBRIDGE AVE	RDB	STR	Fine	Dry	60	1	M/C	M39	W in CANTERBURY RD	20 Proceeding in lane		I	0	1	
E39248766							RUM: 74	On road-out of cont.													
720183	29/07/2010	Thu	07:45		at	CAMBRIDGE AVE	RDB	CRV	Overcast	Wet	60	2	UTE	F21	E in CAMBRIDGE AVE	Unk Proceeding in lane		N	0	0	S
E41961058							RUM: 33	Lane sideswipe					CAR	F58	E in CAMBRIDGE AVE	30 Proceeding in lane					
739008	15/01/2011	Sat	14:30		at	CAMBRIDGE AVE	RDB	STR	Fine	Dry	50	1	CAR	M48	W in CAMBRIDGE AVE	50 Proceeding in lane		I	0	1	
E45111785							RUM: 71	Off rd left => obj					Fence (prior to 2014)								
669765	17/05/2009	Sun	20:30	5 m	S	GLENFIELD RD	RDB	STR	Fine	Dry	60	2	CAR	U U	N in CANTERBURY RD	20 Proceeding in lane		I	0	1	
E153733294							RUM: 33	Lane sideswipe					CAR	F32	N in CANTERBURY RD	0 Stationary					
Liverpool LGA																					
Glenfield																					
Cambridge Ave																					
756565	08/06/2011	Wed	16:10	5 m	W	MOOREBANK AVE	TJN	STR	Fine	Dry	50	2	CAR	M38	E in CAMBRIDGE AVE	Unk Proceeding in lane		I	0	1	
E45263174							RUM: 30	Rear end					TRK	M41	E in CAMBRIDGE AVE	0 Stationary					

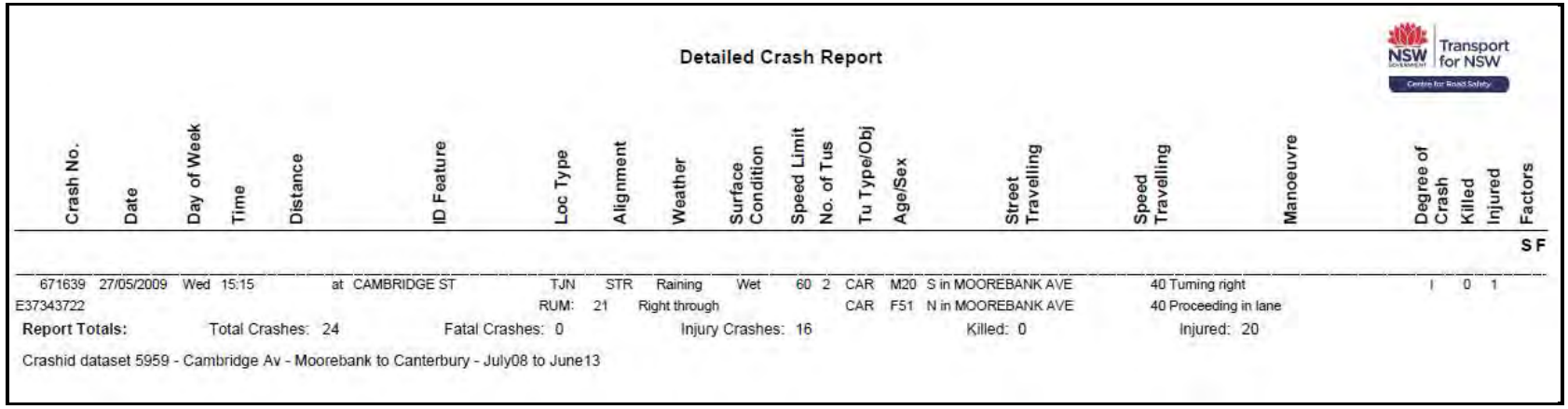
Table 1.1 Cambridge Avenue Detailed Crash Report 2008 – 2013 (Continued)

Detailed Crash Report

Transport for NSW — Centre for Road Safety

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
																					S F
766340	03/09/2011	Sat	01:45	300 m	W	MOOREBANK AVE	2WY	STR	Fine	Dry	60	1	CAR	M33	E in CAMBRIDGE AVE	45	Proceeding in lane	N	0	0	
E46439353							RUM:	71	Off rd left => obj				Tree/bush								
746968	17/03/2011	Thu	12:45	500 m	W	MOOREBANK AVE	2WY	CRV	Overcast	Dry	60	3	CAR	M24	W in CAMBRIDGE AVE	Unk	Proceeding in lane	N	0	0	S
E44095419							RUM:	30	Rear end				CAR	M59	W in CAMBRIDGE AVE	0	Stationary				
													UTE	U U	W in CAMBRIDGE AVE	0	Stationary				
Holsworthy																					
Cambridge Ave																					
647901	28/11/2008	Fri	12:24		at	MOOREBANK AVE	TJN	STR	Raining	Wet	50	2	CAR	M37	S in MOOREBANK AVE	Unk	Turning right	N	0	0	S
E36014129							RUM:	21	Right through				4WD	M28	N in MOOREBANK AVE	60	Proceeding in lane				
679222	10/08/2009	Mon	16:00		at	MOOREBANK AVE	TJN	STR	Fine	Dry	60	2	CAR	M33	S in MOOREBANK AVE	Unk	Turning right	N	0	0	
E37989075							RUM:	21	Right through				TRK	M20	N in MOOREBANK AVE	50	Proceeding in lane				
767738	15/09/2011	Thu	16:20		at	MOOREBANK AVE	TJN	STR	Fine	Dry	60	2	LOR	M35	S in CAMBRIDGE AVE	20	Proceeding in lane	I	0	2	
E45916831							RUM:	32	Right rear				CAR	M40	S in CAMBRIDGE AVE	0	Wait turn right				
785639	27/02/2012	Mon	07:00		at	MOOREBANK AVE	TJN	STR	Fine	Dry	70	2	VAN	F47	S in MOOREBANK AVE	5	Turning right	N	0	0	
E49694788							RUM:	21	Right through				CAR	M47	N in MOOREBANK AVE	55	Proceeding in lane				
652522	08/01/2009	Thu	06:45	5 m	W	MOOREBANK AVE	TJN	STR	Overcast	Dry	60	2	UTE	M22	E in CAMBRIDGE AVE	Unk	Proceeding in lane	I	0	1	
E37986080							RUM:	30	Rear end				CAR	M U	E in CAMBRIDGE AVE	0	Stationary				
677102	03/08/2009	Mon	14:45	5 m	W	MOOREBANK AVE	TJN	STR	Fine	Dry	60	2	CAR	F27	E in CAMBRIDGE AVE	Unk	Proceeding in lane	I	0	1	
E73711201							RUM:	32	Right rear				CAR	F49	E in CAMBRIDGE AVE	0	Wait turn right				
778246	16/12/2011	Fri	09:30	5 m	W	MOOREBANK AVE	TJN	CRV	Fine	Dry	60	2	CAR	M30	E in CAMBRIDGE AVE	20	Proceeding in lane	N	0	0	
E47249341							RUM:	31	Left rear				CAR	M43	E in CAMBRIDGE AVE	20	Turning left				
829273	05/03/2013	Tue	08:05	5 m	W	MOOREBANK AVE	TJN	STR	Overcast	Dry	70	2	CAR	F35	E in CAMBRIDGE AVE	20	Proceeding in lane	I	0	1	
E51292943							RUM:	31	Left rear				WAG	F37	E in CAMBRIDGE AVE	0	Waiting turn left				
738121	01/12/2010	Wed	14:10	600 m	W	MOOREBANK AVE	2WY	CRV	Raining	Wet	60	3	TRK	M43	W in CAMBRIDGE AVE	40	Incorrect side	I	0	4	
E43203329							RUM:	20	Head on				LOR	M41	E in CAMBRIDGE AVE	50	Proceeding in lane				
													CAR	M54	W in CAMBRIDGE AVE	50	Proceeding in lane				
Moorebank Ave																					
734991	30/08/2010	Mon	16:20	10 m	N	CAMBRIDGE AVE	TJN	STR	Fine	Dry	60	3	CAR	F37	S in MOOREBANK AVE	Unk	Proceeding in lane	I	0	1	
E81047401							RUM:	30	Rear end				CAR	F57	S in MOOREBANK AVE	0	Stationary				
													UTE	M56	S in MOOREBANK AVE	0	Stationary				
Moorebank																					
Moorebank Ave																					

Table 1.1 Cambridge Avenue Detailed Crash Report 2008 – 2013 (Continued)



Detailed Crash Report

Transport for NSW — Centre for Road Safety

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
																					S F
671639	27/05/2009	Wed	15:15		at	CAMBRIDGE ST	TJN	STR	Raining	Wet	60	2	CAR	M20	S in MOOREBANK AVE	40	Turning right	I	0	1	
E37343722							RUM:	21	Right through				CAR	F51	N in MOOREBANK AVE	40	Proceeding in lane				

Report Totals: Total Crashes: 24 Fatal Crashes: 0 Injury Crashes: 16 Killed: 0 Injured: 20

Crashid dataset 5959 - Cambridge Av - Moorebank to Canterbury - July08 to June13

Table 1.2 Cambridge Avenue Summary Crash Report 2008 – 2013

Summary Crash Report

Transport for NSW – Centre for Road Safety

# Crash Type		
Car Crash	23	95.8%
Light Truck Crash	3	12.5%
Rigid Truck Crash	2	8.3%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	(2)	(8.3%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(2)	(8.3%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	2	8.3%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	15	62.5%
Non intersection	9	37.5%

* Up to 10 metres from an intersection
~ 07:30-09:30 or 14:30-17:00 on school days

Collision Type		
Single Vehicle	5	20.8%
Multi Vehicle	19	79.2%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	4	16.7%
Unclassified Road	20	83.3%

Contributing Factors		
Speeding	4	16.7%
Fatigue	3	12.5%

Weather		
Fine	16	66.7%
Rain	3	12.5%
Overcast	5	20.8%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	4	16.7%
Dry	20	83.3%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	2	8.3%
Daylight	18	75.0%
Dusk	0	0.0%
Darkness	4	16.7%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	3	12.5%
Opposing vehicles; turning	4	16.7%
U-turn	1	4.2%
Rear-end	9	37.5%
Lane change	2	8.3%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	0	0.0%
Off road on straight, hit object	4	16.7%
Out of control on straight	1	4.2%
Off road, on curve	0	0.0%
Off road on curve, hit object	0	0.0%
Out of control on curve	0	0.0%
Other crash type	0	0.0%

Speed Limit				
~ 40km/h or less	0	0.0%		
40 km/h or less	0	0.0%	80 km/h zone	0 0.0%
50 km/h zone	3	12.5%	90 km/h zone	0 0.0%
60 km/h zone	18	75.0%	100 km/h zone	0 0.0%
70 km/h zone	3	12.5%	110 km/h zone	0 0.0%

CRASHES	24	
Fatal crash	0	0.0%
Injury crash	16	66.7%
Non-casualty crash	8	33.3%

CASUALTIES	20	
Killed	0	0.0%
Injured	20	100.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Time Group		% of Day	
00:01 - 02:59	2	8.3%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	2	8.3%	4.2%
07:00 - 07:59	3	12.5%	4.2%
08:00 - 08:59	1	4.2%	4.2%
09:00 - 09:59	1	4.2%	4.2%
10:00 - 10:59	0	0.0%	4.2%
11:00 - 11:59	1	4.2%	4.2%
12:00 - 12:59	2	8.3%	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	3	12.5%	4.2%
15:00 - 15:59	1	4.2%	4.2%
16:00 - 16:59	5	20.8%	4.2%
17:00 - 17:59	1	4.2%	4.2%
18:00 - 18:59	0	0.0%	4.2%
19:00 - 19:59	0	0.0%	4.2%
20:00 - 21:59	2	8.3%	8.3%
22:00 - 24:00	0	0.0%	8.3%

Street Lighting Off/Nil		% of Dark
0	of 4 in Dark	0.0%

Crashes		Casualties
1	2013	1
2	2012	1
7	2011	5
4	2010	6
8	2009	7
2	2008	0

~ School Travel Time		
Involvement	9	37.5%

McLean Periods			% Week
A	6	25.0%	17.9%
B	0	0.0%	7.1%
C	5	20.8%	17.9%
D	2	8.3%	3.5%
E	0	0.0%	3.6%
F	4	16.7%	10.7%
G	4	16.7%	7.1%
H	1	4.2%	7.1%
I	0	0.0%	12.5%
J	2	8.3%	10.7%

Day of the Week						# Holiday Periods					
Monday	4	16.7%	Thursday	5	20.8%	Sunday	1	4.2%	New Year	0 0.0%	Queen's BD	0 0.0%	Easter SH	0 0.0%
Tuesday	2	8.3%	Friday	5	20.8%	WEEKDAY	19	79.2%	Aust. Day	0 0.0%	Labour Day	0 0.0%	June/July SH	0 0.0%
Wednesday	3	12.5%	Saturday	4	16.7%	WEEKEND	5	20.8%	Easter	0 0.0%	Christmas	0 0.0%	Sept./Oct. SH	1 4.2%
									Anzac Day	0 0.0%	January SH	2 8.3%	December SH	0 0.0%

Table 2.1 Glenfield Road Detailed Crash Report 2008 – 2013

Detailed Crash Report

Transport for NSW – Centre for Road Safety

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
																					S F
Sydney Region																					
Campbelltown LGA																					
Cross Roads																					
Glenfield Rd																					
651982	18/12/2008	Thu	20:00	50 m	E	HUME HWY	2WY	STR	Overcast	Dry	60	2	CAR	M34	E in GLENFIELD RD	10 Perform U-turn		N	0	0	
E36247307							RUM:	40	U turn				CAR	F46	E in GLENFIELD RD	40 Proceeding in lane					
Hume Hwy																					
745513	15/03/2011	Tue	19:45		at	GLENFIELD RD	TJN	STR	Raining	Wet	70	2	CAR	F28	W in GLENFIELD RD	10 Turning right		N	0	0	
E43593635							RUM:	13	Right near				CAR	M61	S in HUME HWY	40 Proceeding in lane					
711983	28/05/2010	Fri	09:15	5 m	N	GLENFIELD RD	TJN	STR	Fine	Dry	70	2	CAR	M72	S in HUME HWY	70 Proceeding in lane		N	0	0	
E42991989							RUM:	30	Rear end				CAR	F42	S in HUME HWY	0 Stationary					
Glenfield																					
Canterbury Rd																					
689955	17/11/2009	Tue	06:06		at	CAMBRIDGE AVE	RDB	STR	Fine	Dry	60	1	M/C	M39	W in CANTERBURY RD	20 Proceeding in lane		I	0	1	
E39248766							RUM:	74	On road-out of cont.												
720183	29/07/2010	Thu	07:45		at	CAMBRIDGE AVE	RDB	CRV	Overcast	Wet	60	2	UTE	F21	E in CAMBRIDGE AVE	Unk Proceeding in lane		N	0	0	S
E41961058							RUM:	33	Lane sideswipe				CAR	F58	E in CAMBRIDGE AVE	30 Proceeding in lane					
739008	15/01/2011	Sat	14:30		at	CAMBRIDGE AVE	RDB	STR	Fine	Dry	50	1	CAR	M48	W in CAMBRIDGE AVE	50 Proceeding in lane		I	0	1	
E45111785							RUM:	71	Off rd left => obj				Fence (prior to 2014)								
669765	17/05/2009	Sun	20:30	5 m	S	GLENFIELD RD	RDB	STR	Fine	Dry	60	2	CAR	U U	N in CANTERBURY RD	20 Proceeding in lane		I	0	1	
E153733294							RUM:	33	Lane sideswipe				CAR	F32	N in CANTERBURY RD	0 Stationary					
Glenfield Rd																					
698026	03/02/2010	Wed	21:00		at	BRAMPTON AVE	XJN	STR	Raining	Wet	60	2	CAR	M27	E in GLENFIELD RD	20 Turning right		I	0	1	
E40094279							RUM:	21	Right through				CAR	F41	W in GLENFIELD RD	60 Proceeding in lane					
750164	07/04/2011	Thu	07:50		at	BRAMPTON AVE	XJN	STR	Fine	Dry	60	3	CAR	F50	W in GLENFIELD RD	50 Proceeding in lane		I	0	2	
E44284438							RUM:	30	Rear end				CAR	M51	W in GLENFIELD RD	0 Stationary					
													4WD	F30	W in GLENFIELD RD	0 Stationary					
762537	02/08/2011	Tue	18:10		at	BRAMPTON AVE	XJN	STR	Fine	Dry	60	2	CAR	F29	E in GLENFIELD RD	10 Turning right		N	0	0	
E44981335							RUM:	21	Right through				CAR	F19	W in GLENFIELD RD	50 Proceeding in lane					
828978	13/02/2013	Wed	11:33		at	BRAMPTON AVE	TJN	CRV	Fine	Dry	60	1	LOR	M31	E in GLENFIELD RD	40 Turning right		N	0	0	S
E51483178							RUM:	80	Off left/right bend												
826607	05/02/2013	Tue	18:55	10 m	E	BRAMPTON AVE	XJN	STR	Fine	Dry	60	2	STA	M54	W in GLENFIELD RD	15 Veering left		N	0	0	
E50436972							RUM:	35	Lane change left				CAR	M33	W in GLENFIELD RD	10 Proceeding in lane					

Table 2.1 Glenfield Road Detailed Crash Report 2008 – 2013 (Continued)

Detailed Crash Report

Transport for NSW – Centre for Road Safety

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
																					S F
786028	23/11/2011	Wed	14:45	100 m	E	BRAMPTON AVE	DIV	STR	Raining	Wet	70	2	4WD	F20	E in GLENFIELD RD	Unk	Incorrect side	I	0	2	F
E45872470							RUM: 20	Head on					CAR	F31	W in GLENFIELD RD	Unk	Proceeding in lane				
835071	28/04/2013	Sun	17:55	1.2 km	E	BRAMPTON AVE	2WY	CRV	Fine	Dry	60	1	CAR	M31	E in GLENFIELD RD	60	Proceeding in lane	N	0	0	S F
E51414903							RUM: 81	Off left/rt bnd=>obj					Roadwork equipment								
765583	01/09/2011	Thu	17:10	200 m	N	GLENFIELD ROAD OP	2WY	STR	Fine	Dry	40	1	TRK	M56	N in GLENFIELD RD	30	Veering left	N	0	0	
E45787031							RUM: 65	Temp roadworks					Roadwork equipment								
640195	01/10/2008	Wed	17:00	55 m	E	HUME HWY	OTH	CRV	Fine	Dry	60	1	M/C	M64	E in GLENFIELD RD	30	Proceeding in lane	I	0	1	S
E34752330							RUM: 88	Out of cont on bend													
631223	15/07/2008	Tue	09:40	100 m	E	HUME HWY	2WY	STR	Fine	Dry	60	1	CAR	F35	W in GLENFIELD RD	60	Proceeding in lane	I	0	2	F
E34761029							RUM: 71	Off rd left => obj					Drain/culvert								
732073	03/11/2010	Wed	15:09	100 m	E	HUME HWY	2WY	STR	Fine	Dry	60	2	CAR	M40	E in GLENFIELD RD	70	Incorrect side	I	0	2	S
E42643304							RUM: 20	Head on					CAR	F24	W in GLENFIELD RD	60	Proceeding in lane				
701770	05/03/2010	Fri	16:15	200 m	E	HUME HWY	2WY	CRV	Raining	Wet	60	2	UTE	M46	E in GLENFIELD RD	20	Proceeding in lane	I	0	1	
E40412079							RUM: 30	Rear end					TRK	M29	E in GLENFIELD RD	10	Proceeding in lane				
781814	22/01/2012	Sun	13:50	675 m	E	HUME HWY	2WY	STR	Fine	Dry	40	2	CAR	F37	E in GLENFIELD RD	10	Perform U-turn	N	0	0	
E47009638							RUM: 40	U turn					CAR	M54	W in GLENFIELD RD	40	Proceeding in lane				
806766	13/08/2012	Mon	11:54	5 m	E	HURLSTONE AGRI ENT	DIV	STR	Fine	Dry	60	2	CAR	M54	W in GLENFIELD RD	45	Proceeding in lane	N	0	0	
E50966484							RUM: 30	Rear end					TRK	M33	W in GLENFIELD RD	0	Stationary				
801314	26/06/2012	Tue	21:20	5 m	N	HURLSTONE AGRI ENT	DIV	STR	Overcast	Wet	40	2	CAR	M48	N in GLENFIELD RD	Unk	Proceeding in lane	N	0	0	
E48201605							RUM: 30	Rear end					CAR	M18	N in GLENFIELD RD	0	Stationary				
701002	09/02/2010	Tue	06:50		at	HURLSTONE HIGH ENT	2WY	CRV	Fine	Dry	50	2	CAR	M U	S in GLENFIELD RD	20	Turning left	I	0	1	
E39434320							RUM: 37	Left turn sideswipe					P/C	M40	S in GLENFIELD RD		Proceeding in lane				
675906	17/07/2009	Fri	10:55	5 m	E	OLD GLENFIELD RD	XJN	STR	Overcast	Dry	60	2	CAR	M21	W in GLENFIELD RD	Unk	Proceeding in lane	N	0	0	
E37866227							RUM: 30	Rear end					TRK	M37	W in GLENFIELD RD	0	Stationary				
725035	11/09/2010	Sat	18:50	600 m	E	OLD GLENFIELD RD	2WY	STR	Fine	Dry	60	2	CAR	M20	E in GLENFIELD RD	60	Incorrect side	I	0	6	F
E42353373							RUM: 20	Head on					CAR	M33	W in GLENFIELD RD	60	Proceeding in lane				
Hume Hwy																					
705885	13/04/2010	Tue	14:15		at	GLENFIELD RD	TJN	STR	Fine	Dry	70	3	CAR	F50	W in GLENFIELD RD	15	Turning right	I	0	2	
E40543206							RUM: 13	Right near					CAR	F57	S in HUME HWY	Unk	Proceeding in lane				
													CAR	F61	W in GLENFIELD RD	15	Turning right				
724053	05/09/2010	Sun	18:50		at	GLENFIELD RD	TJN	STR	Fine	Dry	60	2	CAR	M39	W in GLENFIELD RD	20	Turning right	N	0	0	
E41810323							RUM: 13	Right near					WAG	M86	S in HUME HWY	50	Proceeding in lane				

Table 2.1 Glenfield Road Detailed Crash Report 2008 – 2013 (Continued)

Detailed Crash Report

Transport for NSW – Centre for Road Safety

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors S F
742822	06/02/2011	Sun	19:30		at	GLENFIELD RD	TJN	STR	Fine	Dry	60	2	4WD	M66	S in HUME HWY	50	Proceeding in lane	N	0	0	
E43683650							RUM:	10	Cross traffic				CAR	F42	W in GLENFIELD RD	20	Proceeding in lane				
767583	10/09/2011	Sat	09:30		at	GLENFIELD RD	TJN	STR	Fine	Dry	60	3	CAR	M30	S in HUME HWY	60	Proceeding in lane	N	0	0	
E45868431							RUM:	10	Cross traffic				CAR	M32	W in GLENFIELD RD	60	Proceeding in lane				
													CAR	F51	W in GLENFIELD RD	60	Proceeding in lane				
792107	19/01/2012	Thu	21:20		at	GLENFIELD RD	TJN	STR	Fine	Dry	70	2	CAR	M31	W in GLENFIELD RD	15	Turning left	I	0	1	
E46727705							RUM:	16	Left near				CAR	M38	S in HUME HWY	65	Proceeding in lane				
787939	09/03/2012	Fri	19:00		at	GLENFIELD RD	TJN	STR	Fine	Dry	60	2	CAR	F29	N in HUME HWY	40	Turning right	I	0	2	
E48133253							RUM:	21	Right through				CAR	M46	S in HUME HWY	Unk	Proceeding in lane				
805641	02/08/2012	Thu	15:00		at	GLENFIELD RD	TJN	STR	Fine	Dry	70	2	TRK	M48	N in HUME HWY	10	Turning right	I	0	2	
E290206492							RUM:	21	Right through				TRK	M49	S in HUME HWY	70	Proceeding in lane				
821459	15/12/2012	Sat	17:00		at	GLENFIELD RD	TJN	STR	Overcast	Dry	80	2	CAR	M46	N in HUME HWY	10	Turning right	I	0	2	
E50044118							RUM:	21	Right through				CAR	M77	S in HUME HWY	Unk	Proceeding in lane				
842156	06/06/2013	Thu	09:00		at	GLENFIELD RD	TJN	STR	Fine	Dry	80	2	CAR	F44	W in GLENFIELD RD	Unk	Turning right	I	0	1	
E51319835							RUM:	13	Right near				CAR	M79	S in HUME HWY	45	Proceeding in lane				
665826	01/05/2009	Fri	09:35	5 m	N	GLENFIELD RD	TJN	STR	Fine	Dry	80	2	BDBL	M51	S in HUME HWY	80	Proceeding in lane	I	0	1	
E36970352							RUM:	30	Rear end				CAR	F38	S in HUME HWY	0	Stationary				
669353	02/06/2009	Tue	00:20	5 m	N	GLENFIELD RD	TJN	STR	Fine	Dry	70	2	CAR	M19	S in HUME HWY	Unk	Proceeding in lane	N	0	0	
E39275382							RUM:	30	Rear end				CAR	M33	S in HUME HWY	0	Stationary				
732140	07/11/2010	Sun	18:00	5 m	N	GLENFIELD RD	TJN	STR	Fine	Dry	70	2	CAR	M24	S in HUME HWY	Unk	Proceeding in lane	N	0	0	
E42217670							RUM:	30	Rear end				CAR	M U	S in HUME HWY	0	Stationary				
697191	15/01/2010	Fri	09:30	10 m	N	GLENFIELD RD	TJN	STR	Overcast	Dry	70	3	TRK	F24	S in HUME HWY	45	Proceeding in lane	I	0	1	
E39620711							RUM:	30	Rear end				CAR	M61	S in HUME HWY	0	Stationary				
													CAR	F47	S in HUME HWY	0	Stationary				
700830	28/02/2010	Sun	09:00	10 m	N	GLENFIELD RD	TJN	STR	Overcast	Dry	70	3	CAR	M20	S in HUME HWY	60	Proceeding in lane	I	0	1	
E40245145							RUM:	30	Rear end				M/C	M53	S in HUME HWY	5	Proceeding in lane				
													OMV	U U	S in HUME HWY	0	Stationary				
Liverpool LGA																					
Casula																					
Glenfield Rd																					
839591	27/05/2013	Mon	06:50	20 m	E	HUME HWY	OTH	CRV	Fine	Dry	50	2	TRK	M27	E in GLENFIELD RD	Unk	Pulling out	N	0	0	
E51019209							RUM:	42	Leaving parking				CAR	M55	E in GLENFIELD RD	Unk	Proceeding in lane				

Table 2.1 Glenfield Road Detailed Crash Report 2008 – 2013 (Continued)

Detailed Crash Report

Transport for NSW — Centre for Road Safety

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
																					S F
670228	09/06/2009	Tue	02:20	880 m	E	HUME HWY	2WY	CRV	Fine	Dry	60	2	CAR	F33	E in GLENFIELD RD	60	Proceeding in lane	N	0	0	S F
E37483523							RUM:	81	Off left/rt bnd=>obj				CAR		E in GLENFIELD RD	0	Parked				
736828	13/12/2010	Mon	08:10	10 m	E	OLD GLENFIELD RD	TJN	STR	Fine	Dry	60	2	CAR	F37	E in GLENFIELD RD	50	Proceeding in lane	I	0	1	
E43694841							RUM:	30	Rear end				TRK	M42	E in GLENFIELD RD	0	Stationary				
723073	18/06/2010	Fri	08:45	200 m	E	WHITELEY CL	2WY	STR	Fine	Wet	60	2	VAN	F36	E in GLENFIELD RD	Unk	Perform U-turn	N	0	0	
E43197189							RUM:	40	U turn				CAR	M66	E in GLENFIELD RD	60	Proceeding in lane				
Hume Hwy																					
723824	22/08/2010	Sun	13:30		at	GLENFIELD RD	TJN	STR	Fine	Dry	80	2	CAR	F45	S in HUME HWY	5	Perform U-turn	N	0	0	
E41671423							RUM:	40	U turn				CAR	M59	N in HUME HWY	70	Proceeding in lane				
Glenfield																					
Glenfield Rd																					
795328	06/05/2012	Sun	02:35	390 m	W	BRAMPTON AVE	2WY	CRV	Fine	Dry	50	1	CAR	F24	W in GLENFIELD RD	Unk	Proceeding in lane	I	0	2	S F
E47848148							RUM:	85	Off rt/lft bnd=>obj				Roadwork equipment								
632258	24/07/2008	Thu	17:26	20 m	E	OLD GLENFIELD RD	2WY	STR	Fine	Wet	60	2	CAR	M24	E in GLENFIELD RD	Unk	Proceeding in lane	I	0	1	
E66820601							RUM:	30	Rear end				CAR	M67	E in GLENFIELD RD	40	Proceeding in lane				
Hume Hwy																					
689914	15/11/2009	Sun	01:30		at	GLENFIELD RD	TJN	STR	Fine	Dry	60	1	CAR	M20	W in GLENFIELD RD	80	Turning right	N	0	0	S
E39328931							RUM:	81	Off left/rt bnd=>obj				Signal pole								
661976	01/04/2009	Wed	07:30	5 m	N	GLENFIELD RD	TJN	STR	Raining	Wet	70	2	LOR	M50	S in HUME HWY	70	Proceeding in lane	N	0	0	
E529917690							RUM:	30	Rear end				CAR	F33	S in HUME HWY	0	Stationary				
717478	11/07/2010	Sun	10:30	5 m	N	GLENFIELD RD	TJN	STR	Overcast	Dry	60	2	CAR	F42	S in HUME HWY	30	Proceeding in lane	I	0	1	
E41997667							RUM:	30	Rear end				4WD	M29	S in HUME HWY	20	Proceeding in lane				
646317	24/10/2008	Fri	12:30	10 m	N	GLENFIELD RD	TJN	STR	Fine	Dry	70	3	CAR	M42	S in HUME HWY	60	Proceeding in lane	N	0	0	
E35471326							RUM:	30	Rear end				TRK	M18	S in HUME HWY	0	Stationary				
													4WD	M53	S in HUME HWY	0	Stationary				

Report Totals: Total Crashes: 50 Fatal Crashes: 0 Injury Crashes: 25 Killed: 0 Injured: 39

Crashid dataset 5959 - Glenfield Rd - Campbelltown Rd to Canterbury Rd - July08 to June13

Table 2.2 Glenfield Road Summary Crash Report 2008 – 2013

Summary Crash Report

Transport for NSW – Centre for Road Safety

# Crash Type		
Car Crash	45	90.0%
Light Truck Crash	9	18.0%
Rigid Truck Crash	2	4.0%
Articulated Truck Crash	1	2.0%
'Heavy Truck Crash	(3)	(6.0%)
Bus Crash	1	2.0%
"Heavy Vehicle Crash	(4)	(8.0%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	3	6.0%
Pedal Cycle Crash	1	2.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	32	64.0%
Non intersection	18	36.0%

* Up to 10 metres from an intersection
~ 07:30-09:30 or 14:30-17:00 on school days

Collision Type		
Single Vehicle	9	18.0%
Multi Vehicle	41	82.0%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	21	42.0%
Other Classified Road	29	58.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	8	16.0%
Fatigue	6	12.0%

Weather		
Fine	37	74.0%
Rain	5	10.0%
Overcast	8	16.0%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	9	18.0%
Dry	41	82.0%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	2	4.0%
Daylight	29	58.0%
Dusk	4	8.0%
Darkness	15	30.0%

Crash Movement		
Intersection, adjacent approaches	7	14.0%
Head-on (not overtaking)	3	6.0%
Opposing vehicles; turning	5	10.0%
U-turn	4	8.0%
Rear-end	16	32.0%
Lane change	3	6.0%
Parallel lanes; turning	1	2.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	0	0.0%
Off road on straight, hit object	2	4.0%
Out of control on straight	1	2.0%
Off road, on curve	0	0.0%
Off road on curve, hit object	3	6.0%
Out of control on curve	1	2.0%
Other crash type	4	8.0%

Speed Limit				
40 km/h or less	3	6.0%	80 km/h zone	4	8.0%
50 km/h zone	4	8.0%	90 km/h zone	0	0.0%
60 km/h zone	27	54.0%	100 km/h zone	0	0.0%
70 km/h zone	12	24.0%	110 km/h zone	0	0.0%

~ 40km/h or less	0	0.0%

CRASHES	50	
Fatal crash	0	0.0%
Injury crash	25	50.0%
Non-casualty crash	25	50.0%

CASUALTIES	39	
Killed	0	0.0%
Injured	39	100.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Time Group		% of Day	
00:01 - 02:59	4	8.0%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	3	6.0%	4.2%
07:00 - 07:59	3	6.0%	4.2%
08:00 - 08:59	2	4.0%	4.2%
09:00 - 09:59	7	14.0%	4.2%
10:00 - 10:59	2	4.0%	4.2%
11:00 - 11:59	2	4.0%	4.2%
12:00 - 12:59	1	2.0%	4.2%
13:00 - 13:59	2	4.0%	4.2%
14:00 - 14:59	3	6.0%	4.2%
15:00 - 15:59	2	4.0%	4.2%
16:00 - 16:59	1	2.0%	4.2%
17:00 - 17:59	5	10.0%	4.2%
18:00 - 18:59	5	10.0%	4.2%
19:00 - 19:59	3	6.0%	4.2%
20:00 - 21:59	5	10.0%	8.3%
22:00 - 24:00	0	0.0%	8.3%

Street Lighting Off/Nil	% of Dark
1 of 15 in Dark	6.7%

Crashes		Casualties
5	2013	1
8	2012	9
8	2011	5
16	2010	17
8	2009	3
5	2008	4

~ School Travel Time		
Involvement	11	22.0%

McLean Periods			% Week
A	8	16.0%	17.9%
B	0	0.0%	7.1%
C	11	22.0%	17.9%
D	2	4.0%	3.5%
E	4	8.0%	3.6%
F	5	10.0%	10.7%
G	6	12.0%	7.1%
H	7	14.0%	7.1%
I	4	8.0%	12.5%
J	3	6.0%	10.7%

Day of the Week						# Holiday Periods					
Monday	3	6.0%	Thursday	8	16.0%	Sunday	11	22.0%	New Year	0	0.0%	Queen's BD	0	0.0%	Easter SH	2	4.0%
Tuesday	10	20.0%	Friday	8	16.0%	WEEKDAY	35	70.0%	Aust. Day	0	0.0%	Labour Day	0	0.0%	June/July SH	3	6.0%
Wednesday	6	12.0%	Saturday	4	8.0%	WEEKEND	15	30.0%	Easter	0	0.0%	Christmas	0	0.0%	Sept./Oct. SH	1	2.0%
									Anzac Day	0	0.0%	January SH	4	8.0%	December SH	0	0.0%

Glenfield Waste Services

Industrial Rezoning Proposal

Traffic Impact Assessment

June 2015

Appendix D Sub-Regional Projects

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Introduction

So as to appropriately assess the potential impacts of the Proposal on the local road network, forecast flows for a year 2024 have been prepared which account for traffic increases through that network, as well a potential changes arising from the upgrade of network infrastructure. These projects are detailed in the following sections: -

- **Section 1 The Glenfield Road Urban Release Area**
- **Section 2 The Campbelltown Road Upgrade**
- **Section 3 Average Annual Traffic Flow Increases**
- **Section 4 The Glenfield Link Road**
- **Section 5 The GWS State Significant Development**
- **Section 6 The Moorebank Avenue Intermodal**

1 Glenfield Road Urban Release Area

1.1 Location & Stage of Development

The Glenfield Road Urban Release Area (**GRURA**) is bordered by Glenfield Road, Old Glenfield Road, Campbelltown Road and Hurlstone Agricultural High School, and upon completion is estimated to provide a total of approximately 1,100 residential dwellings including stand-alone dwellings (980) and townhouses (120).

Based on our discussions with Mirvac (who are developing the majority of the GRURA) and with CC Council, it is estimated that more than two-thirds of the GRURA is currently (August 2014) occupied – CC Council estimates only a further 220 dwellings to be completed, i.e. that some 880 dwellings are completed and occupied. Based on the building schedule provided in the CC Council Section 94 Development Contributions Plan - Glenfield Road Urban Release Area all of the GRURA would be fully constructed and occupied within the next few years.

1.2 GRURA Trip Characteristics

1.2.1 GRURA Trip Generation

Pairing the GRURA occupancy estimates above with the surveyed trip generation at the GRURA access intersections at Glenfield Road & Brampton Avenue & Old Glenfield Road, and at Glenfield Road & Atlantic Boulevard, suggests a current trip generation per dwelling significantly lower that standard, such that GRURA dwellings are on average generating less than 0.5 trips per dwelling in the peak periods. No detailed traffic studies relating to the GRURA have become available for review such as might justify this low generation rate

It is difficult to justify the application of these surveyed generation rates to a completed GRURA. If the GRURA was directly adjacent to Glenfield Station, or to high frequency bus services; or to immediately available employment and service centres, then perhaps a reduced generation might be appropriate. However, this is not the case at the GRURA, and as such the potential for future higher rates must be accounted for.

With reference to more "standard" generation rates (RTA Guide to Traffic Generation Developments) it is estimated that: -

- Houses would generate 0.85vph in the AM and PM
- Townhouses would generate 0.65vph in the AM and PM
- A small percentage of trips would be internal, but the majority external to the GRURA

Based on these factors, it is estimated that the GRURA would generate some 820vph in the AM and PM external to the GRURA, i.e. to the local road network and specifically to Glenfield Road.

1.2.2 GRURA Trip Distribution

While not providing a detailed assessment of the GRURA trip generation, the 2010 Glenfield Road Assessment of Intersection Requirements report (**GR AIR**) prepared by Transport & Urban Planning provides a forecast of GRURA trip distribution. While not connected to the main estate at this time, the GR AIR estimates that once Atlantic Boulevard is linked internally, 50% of GRURA trips will utilise the intersection of Glenfield Road & Atlantic Boulevard for primary access to Glenfield Road, with a majority of those trips being to/from the east. The broader distribution profile for the GRURA provided in the GR AIR can be summarised as follows: -

- 50% of trips via the intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road, of which: -
    - 75% to/from the west
    - 25% to/from the east

- 50% of trips via the intersection of Glenfield Road & Atlantic Boulevard, of which: -
    - 25% to/from the west
    - 75% to/from the east

While the GR AIR provides what might be considered a worst case assessment in regard to the trip assignment to Atlantic Boulevard, it is the case that this distribution profile does not consider the location of GRURA dwellings in Old Glenfield Road. As such, while the external origin and destination profile remains valid, the intersection of Glenfield Road & Brampton Avenue & Old Glenfield Road is estimated to generate approximately 55% of all trips (with approximately 10% generated to/from Old Glenfield Road) and the remaining trips would be generated to/from Atlantic Boulevard.

Away from the GRURA access intersections, trips have been distributed proportionally with reference to existing surveyed approach distribution. It is estimated that 25% of trips would be inbound in the AM, and 75% of trips inbound in the PM.

1.3 GRURA Forecast Flows

With reference to the trip generation and distribution characteristics of a completed GRURA as outlined above, the resulting GRURA trips to the local road network which will form part of "Base" 2024 traffic flows are shown in the figures below. It is noted that these flows represent the total generation of the GRURA, and would not therefore be additional to the existing GRURA flows generated by occupied sections of the estate.

Figure 1.3.1 AM GRURA Trips

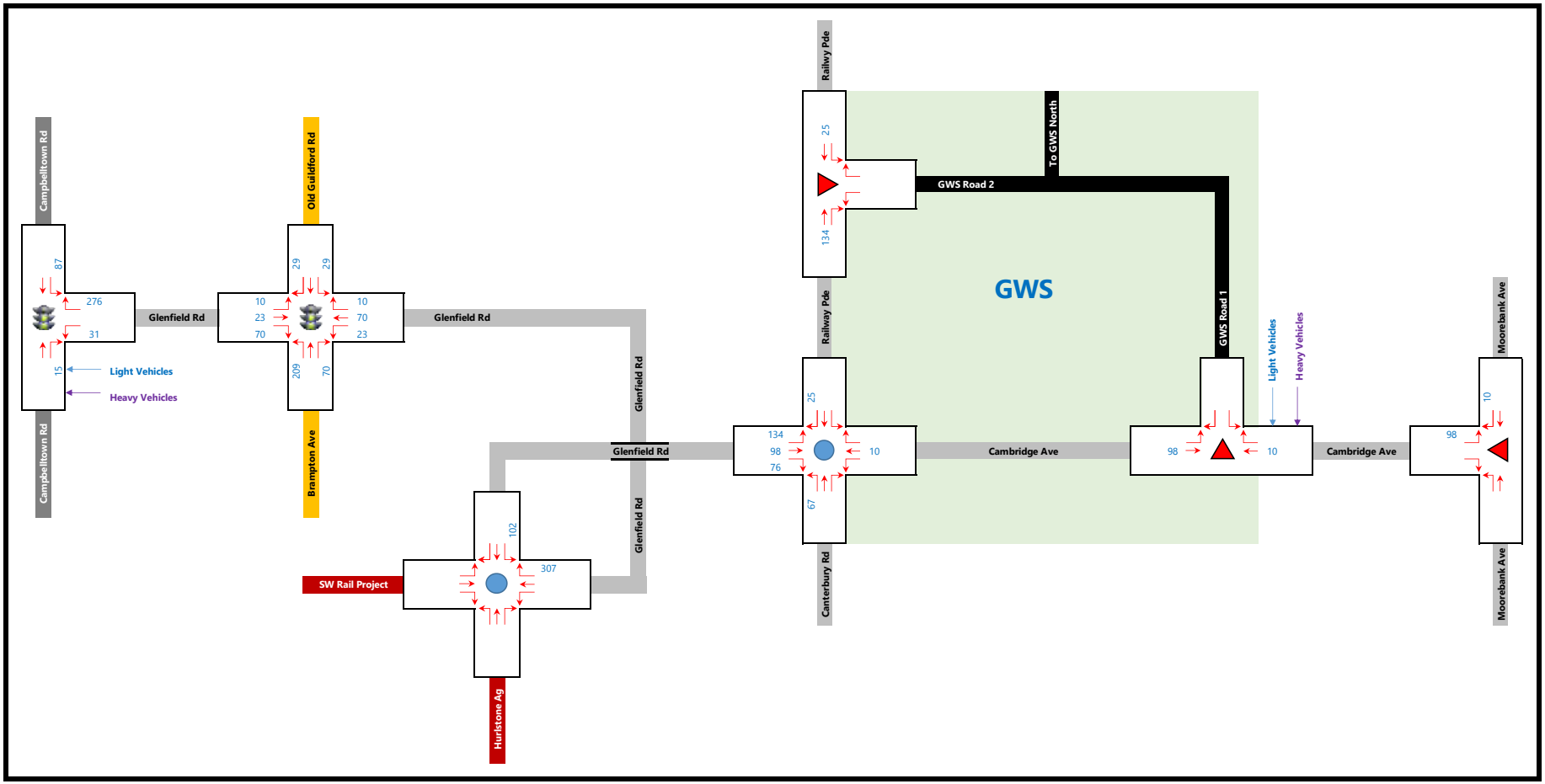
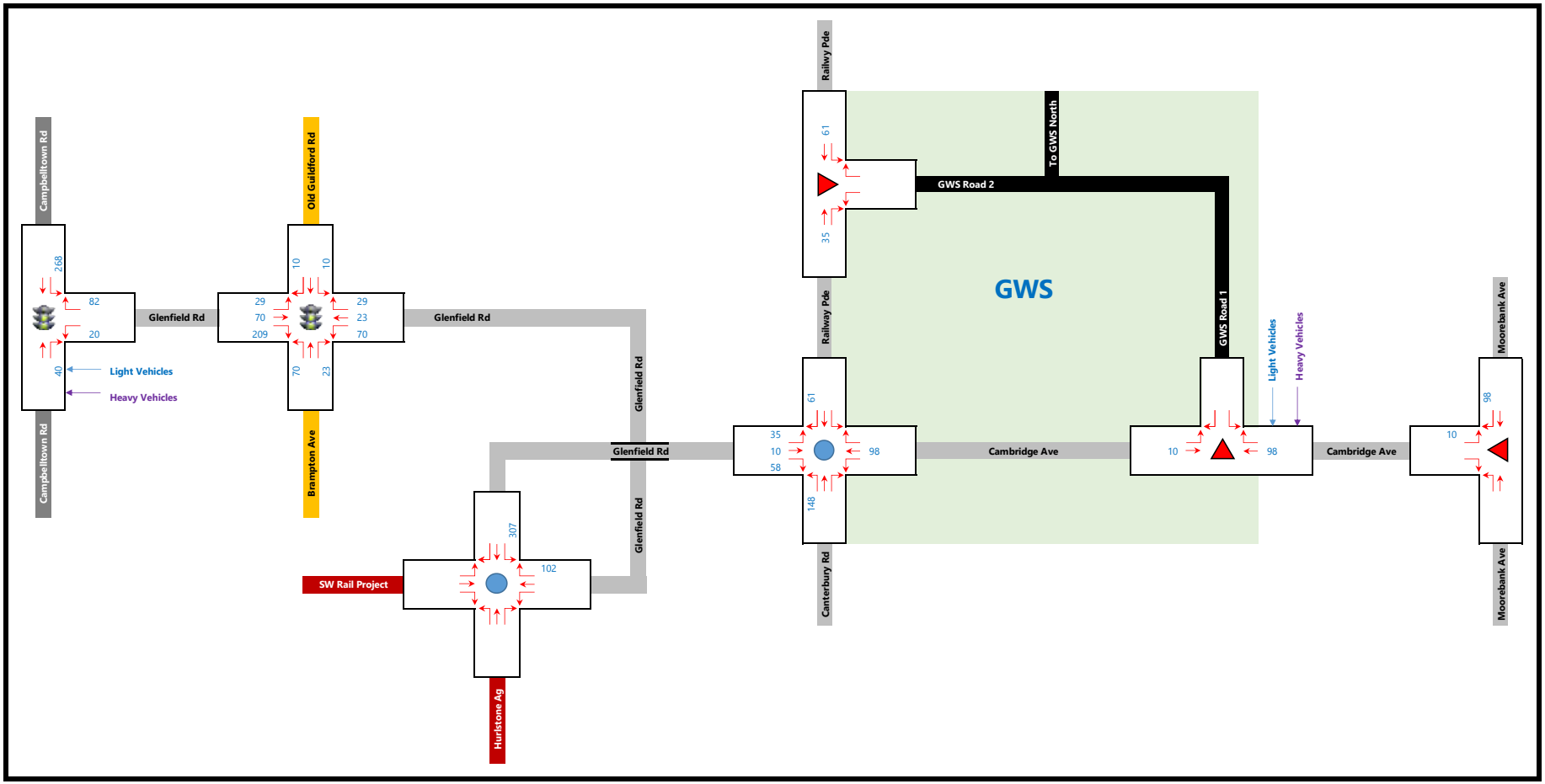


Figure 1.3.1 PM GRURA Trips



2 Campbelltown Road Upgrade

2.1 Project Documents

The RMS is currently finalising proposals for the upgrade of Campbelltown Road between Casula and Denham Court (the **Upgrade**); much of the Upgrade is in response to the development of Urban Activation Precincts (**UAP**s) along Campbelltown Road (south of Glenfield Road) as well as existing traffic demands. Based on our discussions with the RMS Campbelltown Road **Upgrade Project Team**, the southern sections of the upgrade would be completed first, with the upgrade of the intersection of Glenfield Road likely to be one of the later upgrades (but prior to 2024).

The 2013 Campbelltown Road Upgrade Review of Environmental Factors: Traffic and Transport Modelling Assessment (**CR TTMA**) prepared by AECOM, and supplementary Campbelltown Road REF Supplementary Traffic Assessment (**CR REF STA**) outline the traffic analysis undertaken to determine the scope of required upgrades to Campbelltown Road. The outcomes of these traffic assessments are examined in sections below so as to provide an appropriate forecast of Base 2024 flows at the intersection – and specifically of through movements in Campbelltown Road.

2.2 Campbelltown Road Flow Forecasts

Recent (2011 and 2013) traffic surveys conducted by ARC at the intersection of Campbelltown Road & Glenfield Road indicate AM northbound through flows in Campbelltown Road significantly lower than those identified as Base 2011 flows in the CR REF STA and southbound flows in the PM much higher than the Base 2011 flows in the CR REF STA. A comparison of these flows is provided below.

Table 2.1 Campbelltown Road south of Glenfield Road Traffic Counts

Campbelltown Road south of Glenfield Road	Northbound		Southbound		TOTAL	
	AM	PM	AM	PM	AM	PM
2011 Survey (CR REF)	1351	570	611	1410	1962	1980
2011 Survey (CR REF STA)	1422	600	643	1484	2065	2084
2011 ADT (TCS Instruments)	801	378	924	1844	1725	2222
2013 Survey (Skyhigh)	899	455	884	1769	1783	2224

The CR REF STA then forecasts significant growth increases in Campbelltown Road 2026, with the total future flow forecasts through the intersection with Glenfield Road summarised below: -

- 1,826vph northbound in the AM 2026
- 1,133vph southbound in the AM 2026
- 749vph northbound in the PM 2026
- 2,703vph southbound in the PM 2026

Based on the differences between the CR REF STA Base 2011 flows and the recent surveyed flows as per **Table 2.1**, the potential exists that the forecast AM northbound flow is overstated by some 500vph; and the PM southbound flow is understated by some 400vph.

2.3 Glenfield Road Flow Forecasts

The CR TTMA reports that some of the traffic flows to and from Glenfield Road – and particularly to and from the South - will be lower in 2026 than the 2011 flows. The scope of these reductions differs between the CR TTMA and the subsequent CR REF STA, but some examples include: -

- Glenfield Road left to Campbelltown Road flow reduced from 74vph in 2011 to 44vph in 2026 in the AM; and from 146vph in 2011 to 63vph in 2026 in the PM
- Glenfield Road right to Campbelltown Road flow reduced from 559vph in 2011 to 514vph in 2026 in the PM
- Campbelltown Road left to Glenfield Road flow reduced from 656vph in 2011 to 614vph in 2026 in the AM

To date ARC has not been able to determine the reason for these lower flows. If it were the case that the CR REF STA analysis included the potential **Link Road** from Glenfield Road at the railway to Campbelltown Road (see **Section 4** below) then [somewhat] similar flow reductions might occur, but the RMS has stated that a new eastern approach to the intersection of Campbelltown Road & Beech Road identified in the CR REF STA does not represent the Link Road. Rather, it represents an additional trip generator [on the Hurlstone Agricultural College site). Certainly the new approach (which generates some 1,000vph in the AM and PM in 2026) does not have the expected characteristics of the Link Road, with primary flows being through flows across Campbelltown Road between the new approach and Beech Road.

Of equal important is the surveys commissioned as part of this TIA indicate turning flows from Glenfield Road – and particularly to the north – are already higher than the 2026 estimates in the CR REF STA, and thence significantly higher further to consideration of the additional GRURA trip generation as detailed in **Section 1** above.

As stated, ARC has discussed these issues with the Upgrade Project Team; the RMS has acknowledged these potential issues, but have stated the upgrade of the Campbelltown Road & Glenfield Road intersection will occur in the later stages of the Upgrade, and only further to additional (updated) assessment of Upgrade requirements prior to a final Upgrade determination.

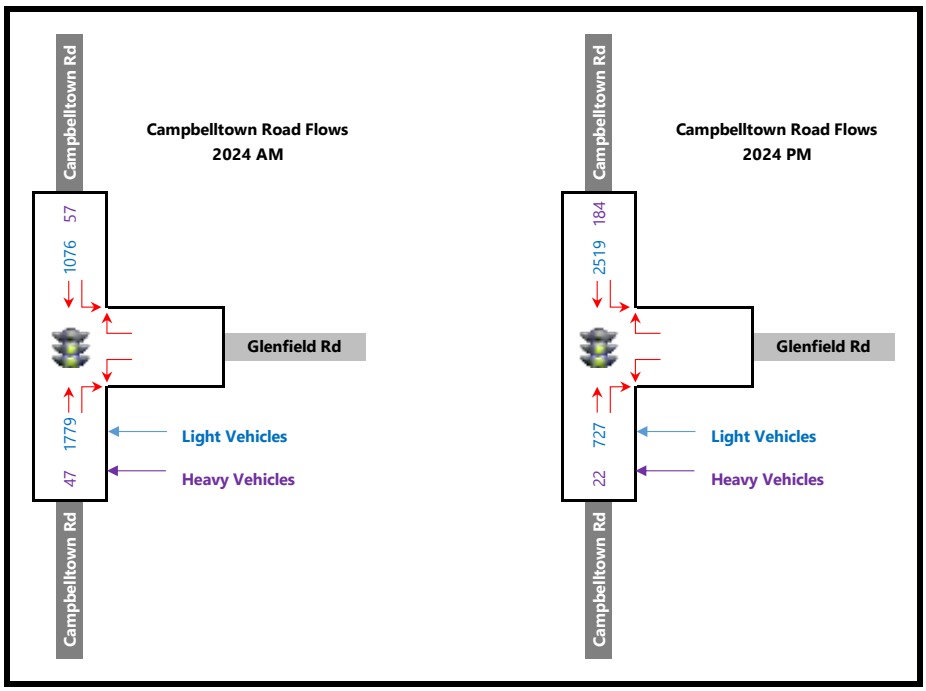
2.4 2024 Forecast Flows

Notwithstanding the issues raised above, ARC has adopted the following forecast method: -

- Forecast future through movements in Campbelltown Road with reference to the CR REF STA 2026 volumes; given the progress of development at many of the residential estates south of Glenfield Road, these [2026] increases have the potential to be largely evident by the forecast year 2024 used in this TIA.
- Forecast future turning movement to/from Glenfield Road with reference to the analysis provided in this TIA, and specifically including existing (2013 surveyed) traffic; GRURA traffic flows; and [minor] average annual increases (see **Section 3**). As discussed, these turning movements are significantly higher than those reported in 2026 in the CR REF STA.

As such, the additional flows used to provide a Base 2024 flow forecast are restricted to the additional through movements in Campbelltown Road at the intersection with Glenfield Road. These additional flows are assigned below, with heavy vehicle numbers based on the heavy vehicle percentages specified in the CR REF STA.

Figure 2.4 Campbelltown Road Flows 2024



3 Average Annual Traffic Growth

A review of available traffic data for the sub-region has been undertaken, including available traffic and transport reports relating to sub-regional development proposals and road proposals; and RMS Average Annual Daily Traffic (**AADT**) and Average Daily Traffic (**ADT**) data.

A summary of available AADT and ADT traffic flows in the local network is provided in **Table 3**.

Table 3 AADT and ADT Data

Location		RMS AADT								Hyder ADT	ARC ADT
		1989	1991	1993	1996	1999	2002	2005	2009	2010	2013
Moorebank Avenue	at East Hills Railway Overbridge			14770	15295	14767	14840	15901	14090	16500	
Glenfield Road	North of Cambridge Avenue Bridge			12935	11888	11871	12424	12232	12841		
Cambridge Avenue	East of Canterbury Road	19073	18990	18891							15421

Note 1 *Sydney Intermodal Terminal Alliance Transport and Accessibility Impact Assessment, Hyder 2013*

Note 2 *December 2013 ATC Survey* (**Appendix A**)

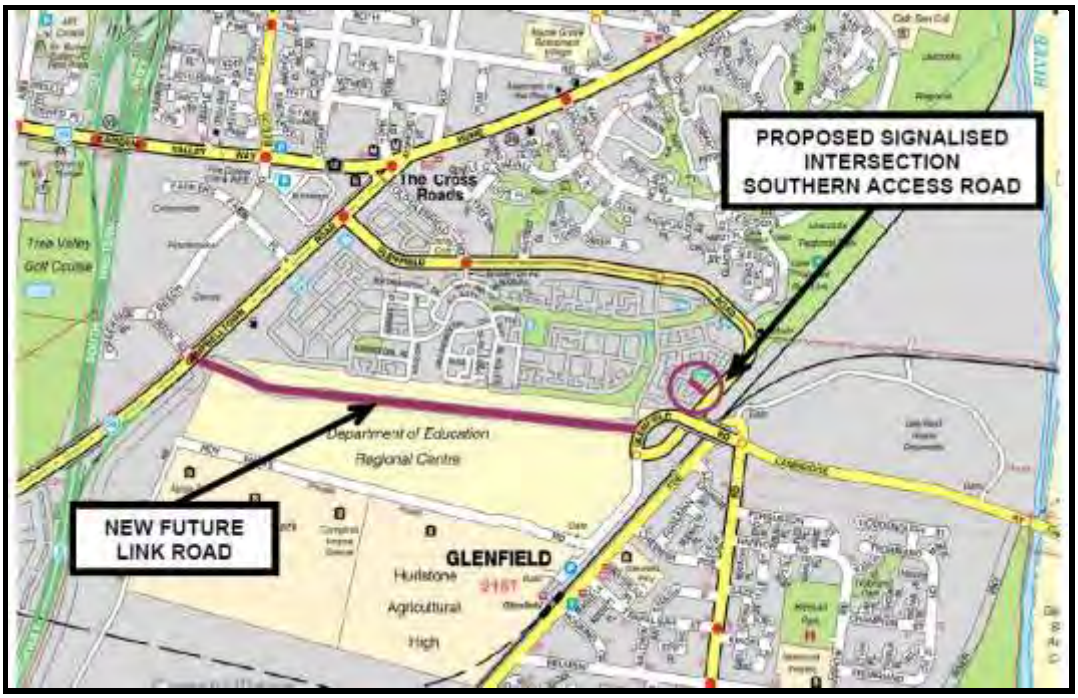
This data suggests that the traffic flows in Glenfield Road and Cambridge Road are essentially stagnant, and while there is certainly potential for targeted growth further to local developments (as detailed in this **Appendix**) those developments will in and of themselves constitute the overwhelming majority of "annual growth". As such, a rate of 0.5% per annum has been applied to background growth through the local network, i.e. the 2013/2014 surveyed flows have been factored by 0.5% per year over 10 years.

4 Glenfield Link Road

4.1 The Link Road

Further to **Section 2.3** above, CC Council has examined the potential for a new sub-regional road which would reduce the existing (and future) traffic demands in Glenfield Road (and at the intersection of Campbelltown Road). Based on our discussions with CC Council and a review of available information, the link would potentially extend from the existing Glenfield Road Bridge at the railway, across the Hurlstone Agricultural College to a new link at Campbelltown Road, likely (based on the alignment of the link) to an intersection with Beech Road. The link is described in the GR AIR referenced in **Section 2**, and is shown in **Figure 4.1** below. As discussed, this appears to be a similar approach to that modelled in the CR REF STA, but again the RMS have indicated that the new approach is not the Link Road.

Figure 4.1 Potential Link Road Alignment



Source: GR AIR

The GR AIR further provides the following in regard to the Link Road: -

> *Discussions with Campbelltown City Council's Manager of Technical Services confirms that there is a Council proposal for the construction of a future link road between Glenfield Road and Campbelltown Road. The road would be south of the proposed subdivision* [the GRURA] *and located on Department of Education land and link to Campbelltown Road at Beech Road at its western end and to Glenfield Road south of the bridge over the rail line, at its eastern end…*

The new link road would become the main road and the existing section of Glenfield Road north of the link road would be downgraded. Future traffic volumes using Glenfield Road will decrease substantially following the construction of the new link road…

The timing of the new link road is not finalised, although it is understood that the road may be provided around 2021, depending on authority agreements.

4.2 Link Road Current Status

Further to our discussions with CC Council, the Link Road remains a priority for CC Council, particularly with reference to the potential generation of the Moorebank Avenue Intermodal to and from the south and south west, a point raised in CC Council submissions in regard to the Intermodal project (see **Section 6** below). Council has also notified ARC that they are currently in discussions with the [potential] future operators of the Intermodal in regard to the Link Road.

Significantly however, an addendum to the CR TTMA does include a new eastern approach to the Campbelltown Road & Beech Road intersection – i.e. to where the Link Road is envisaged to meet Campbelltown Road - but information provided by the Upgrade Project Team has specifically stated that this is not representative of the Link Road, but rather a new access for the Hurlstone Agricultural College (**HAC**) as stated in RMS Campbelltown Upgrade Supplementary Land Use and Socio-Economic Impact Assessment (Appendix E of the Upgrade documentation available on the RMS website): -

There is currently no access to the school from Campbelltown Road. The proposal would create a southern approach to the Beech Road intersection, which would facilitate improved access to Roy Watts Road in the future, thereby improving accessibility of the Hurlstone Agricultural High School.

This new access road has the potential to significantly reduce trips to the HAC via the roundabout off Glenfield Road, and trips to and from Glenfield Road east of Campbelltown Road, but the Upgrade documentation does not provide any sub-regional modelling in regard to such reductions.

The greatest potential for 'a' Link Road to be developed would arise from future assessments of the Intermodal which identify a trip demand to the south and south west via the local road network. In turn, it is likely that the Link Road might itself be connected to an upgraded Cambridge Avenue, and again in turn to a new bridge to replace the Cambridge Avenue Causeway.

However, given the current state of planning for the Glenfield and Moorebank areas – and specifically with reference to the traffic assessments of the Intermodal indicating [essentially] little trip generation through Glenfield – the potential for the Link Road to be constructed in the next 10 years remains remote, and moreover a connection to Beech Avenue as previously proposed appears unlikely.

As such, this TIA has not further considered the potential [benefits] of the Link Road.

5 GWS State Significant Development

5.1 The SSD Proposal

Concurrent to the Proposal, GWS proposes a State Significant Development (**SSD**) Recycling **Facility** on land within the southern portion of the GWS Site (the **SSD Proposal**). Recycling materials will be primarily sourced from commercial and industrial, and construction and demolition waste. The Facility will be constructed across approximately 5ha of the 28 hectares of rezone land examined in this TIA, and employee up to 20 people.

The Facility would provide capacity for the recycling of up to 450,000tpa, including: -

- Up to 250,000tpa of general recyclable materials
- Up to 200,000tpa of sandstone from major projects

With regard to sandstone recycling, the potential capacity of these operations would be driven by major projects i.e. if there were no major projects then there would be no sandstone delivered to or (once recycled) taken from the Site.

ARC has prepared a detailed TIA of the SSD Proposal on behalf of GWS (the **SSD TIA**), a summary of which is provided below.

5.2 Access

All inbound access (to the existing landfill operations and proposed Facility in the northern and southern portions of the Site respectively) will be via the existing intersection of GWS Road 1 & Cambridge Avenue.

Once on-site, vehicles travelling to and from the landfill operations will utilise the existing weighbridge north of Cambridge Avenue, then existing internal access roads through the Site to the northern portion of the Site. These vehicles would then return via the same internal access roads, again utilise the weighbridge and depart the Site via the intersection of GWS Road 1 & Cambridge Avenue.

Once on-site, vehicles travelling to the Facility will turn west before the existing weighbridge, and then utilise new weighbridge facilities before proceeding through the Facility to the appropriate materials recovery area. Once unloaded (or loaded) vehicles would depart the Site via the existing GWS access intersection of GWS Road 2 & Railway Parade. It is expected that almost all of these departing vehicles would then turn left back to the roundabout intersection of Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade.

5.3 Traffic Generation

Further to consideration of the vehicle characteristics (and specifically material carrying capacity) for the different recycling streams provided for by the Facility, it is estimated that the [existing] landfill and [proposed] recycling operations could at capacity generate some 600vpd. Approximately 70% of vehicles would be heavy vehicles.

5.4 Trip Distribution

The SSD Proposal vehicle trips have been assigned across the day – and specifically to the peak hours - with reference to a 6 month sample of weighbridge data. With regard to directional distribution, there is no information to suggest that the existing surveyed distribution profile of the GWS operations would be significantly altered by the SSD Proposal, with trips generally split between the east and west.

5.5 SSD Proposal Forecast Flows

With reference to the traffic flow forecasts, arrival profiles and directional distribution, the distribution of future SSD flows to the local road network is shown in the figures below. It should be noted that these flows would replace existing flows to and from GWS, not be additional to existing flows.

Figure 5.5.1 AM SSD Proposal Trips

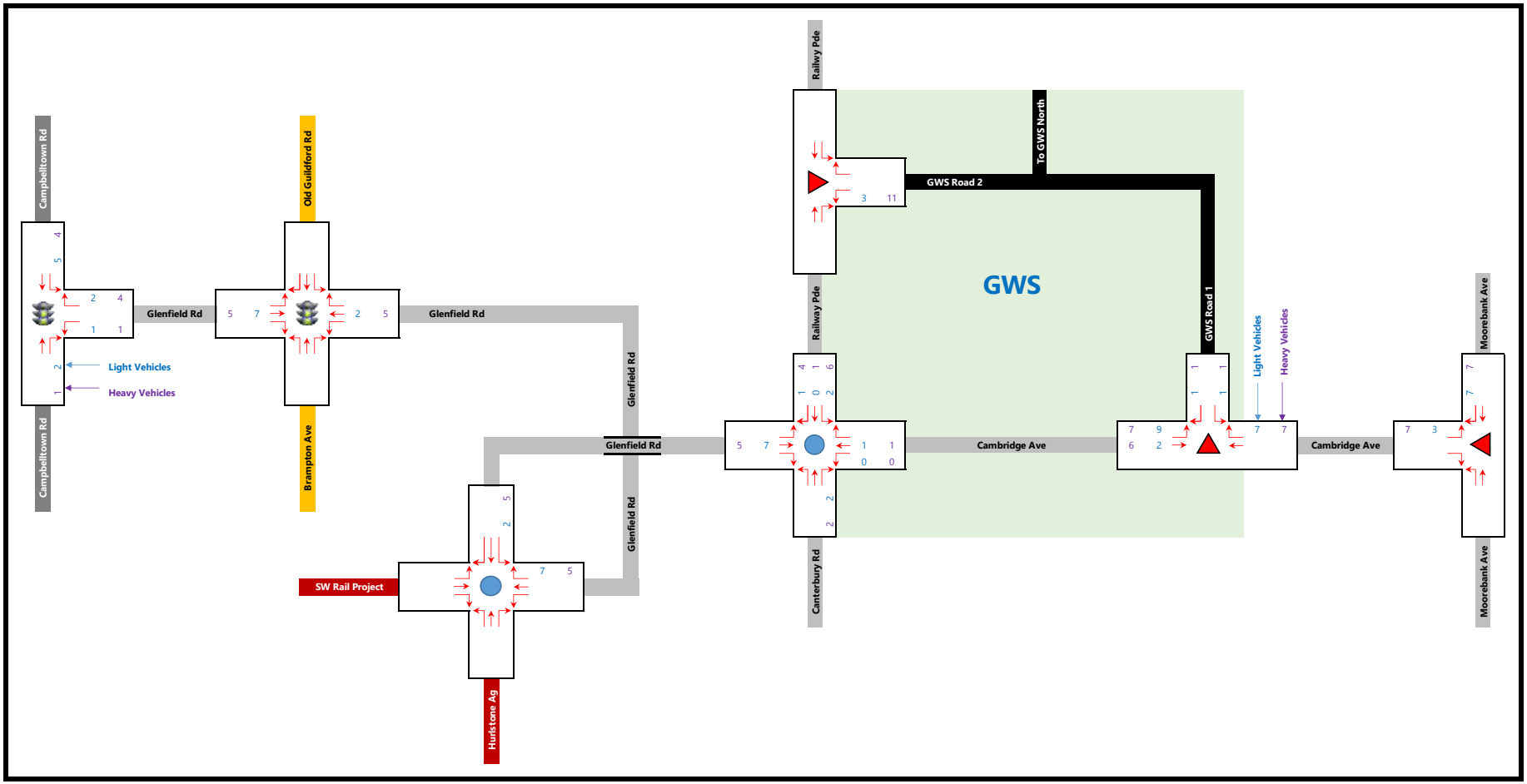
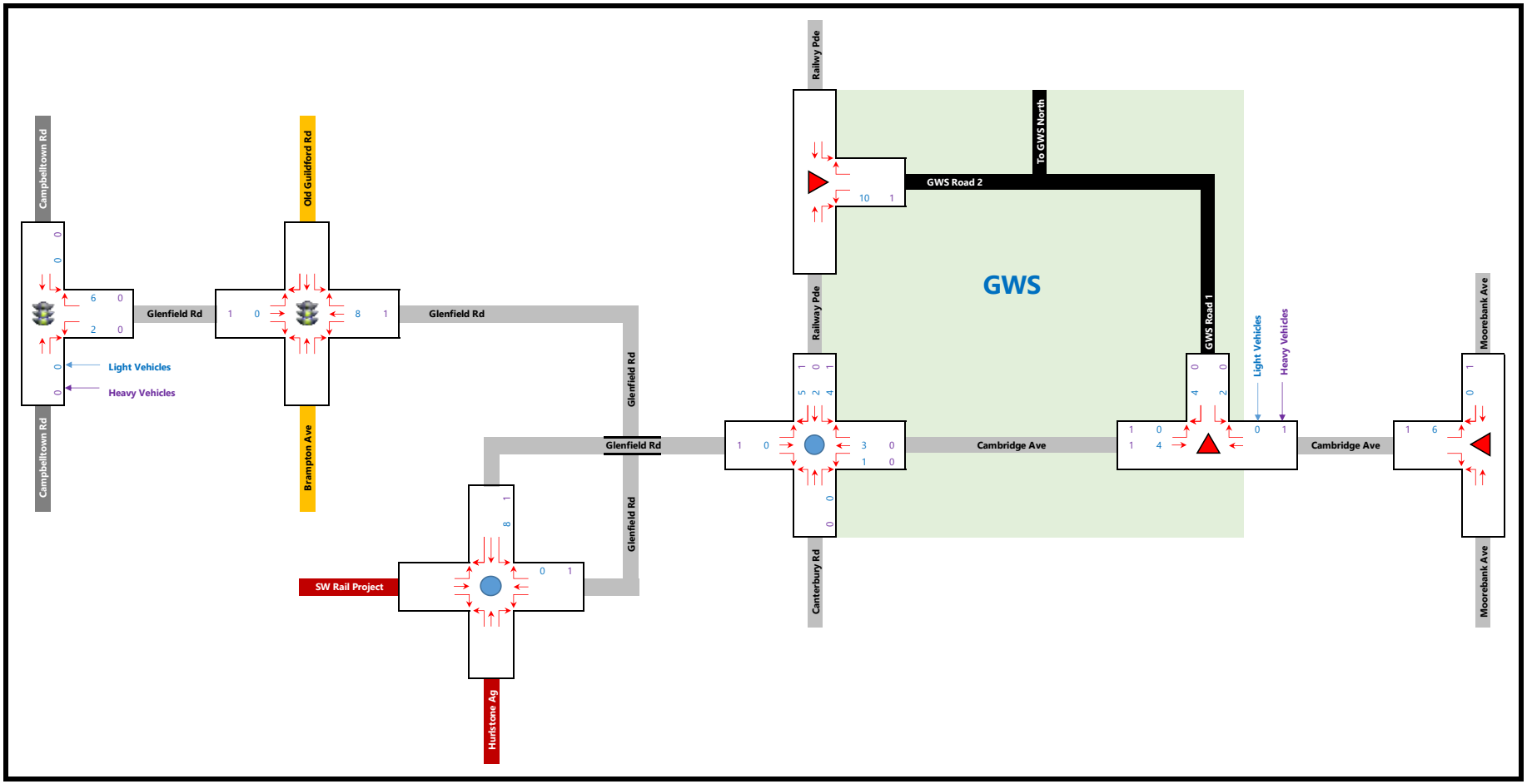


Figure 5.5.1 PM SSD Proposal Trips



6 Moorebank Avenue Intermodal

6.1 The Intermodal Proposal

Two Intermodal facilities have been proposed on Department of Defence and privately owned land in Moorebank, and specifically accessing Moorebank Avenue south of Anzac Road. The Moorebank Intermodal Terminal Facility to the east of Moorebank Avenue has been proposed by the Sydney Intermodal Terminal Alliance (**SIMTA Intermodal**), while the Commonwealth Government has long held plans to develop the Moorebank Intermodal Terminal (currently under the guidance of the Moorebank Intermodal Company – **MIC Intermodal**) to the west of Moorebank Avenue.

More recently (May 2014) it has been proposed that the Intermodal projects be combined. While this will require future confirmation, it is nonetheless the case that the basic traffic and transport impacts of the Intermodal developed as either a single or separate venture are unlikely to be significantly different - **the Intermodal will regardless generate all vehicle trips to Moorebank Avenue, and from there either to the north or south**.

6.2 Intermodal Capacity

Original estimates of the capacity of the Intermodal were for the distribution of some 2.7 million *Twenty Foot Equivalent Units* (**TEU**s) per year (1M TEUs at the SIMTA Intermodal, 1.7M TEUs at the MIC Intermodal); however, based on the QUBE and MIC media releases of 22nd May 2014, it appears that a more appropriate estimate of capacity would be for a total of some 1.7M TEUs per year through the Intermodal.

6.3 Intermodal Distribution Routes

Sections below examine the potential for the Intermodal to generate vehicle trips to the **Local Route** through Glenfield, and specifically along Cambridge Avenue and Glenfield Road between Moorebank Avenue and Campbelltown Road respectively. The potential distribution of Intermodal trips to the Local Route has been discussed at length with CC Council, LC Council, TNSW, and the RMS.

6.3.1 SIMTA TIA Trip Distribution – Weight Restrictions

The 2013 SIMTA Transport and Accessibility Impact Assessment (**SIMTA TIA**) states that only a very small number of trips will be generated to Cambridge Avenue due to weight limit restrictions: -

> *The Cambridge Avenue south to the SIMTA site has weight limitations which would inhibit the use of this road for heavy trucks. Hyder's traffic assessment considered that it may be possible for this road to be used by small distribution vehicles and employee cars only.*

Reference to the 2010 RMS *Heavy Vehicle Mass Limits* fact sheet - and further to discussions with the RMS and numerous freight (container transport) companies - confirms that articulated vehicles up to 42.5tonnes in weight and length of up to 19m can use the Local Route at any time of the day. The majority of freight companies stipulate the maximum weight of [container] cargo precisely so that container carrying articulated vehicles fall into the RMS vehicle category of ***General Access Vehicles*** (**GAV**s) which are able to use any road that is not specifically weight limited. Cambridge Avenue and Glenfield Road have no such weight limits.

It is the case that Cambridge Avenue west of GWS Road 1 provides a ***Restricted Access Vehicle*** (**RAV**) route, specifically allowing for overweight and/or oversized vehicles to travel to and from the GWS Site. RAVs are therefore not able to use Cambridge Avenue between GWS Road 1 and Moorebank Avenue, but all other vehicles can use this section of road.

This issue was also raised in submissions in regard to the SIMTA TIA by both CC Council and LC Council; the December 2013 **SIMTA Submissions Report** provides the following response: -

> *It is also noted that Cambridge Avenue is currently subject to restrictions under the Roads Transport (Mass Loading and Access) Regulation 2005 and the Road Transport (Vehicle Registration) Regulation 2007, which prevents restricted access vehicles (RAVs) from using roads outside of the routes identified on RMS RAV maps. Trucks accessing the SIMTA site would be bound to follow this legislation, preventing 'rat running' and restricting them from using roads that have not been prescribed as heavy vehicle access routes. As only sections of Cambridge Avenue currently allow for 'Restricted Access Vehicles' and timing restrictions are applicable for its use, its feasibility and practicality as an access route, even for rigid trucks is limited.*

2013/2014 traffic surveys indicate than some 800 heavy vehicles currently use Cambridge Avenue on an average weekday, specifically including articulated vehicles (many of which visit the Site having arrived from the east). The SIMTA TIA identifies RAVs as comprising 30% of all articulated vehicle trips; while these vehicles could not use the Local Route, the majority of articulated vehicles, all rigid trucks and all staff vehicles could use the Local Route.

Given that the SIMTA TIA includes sub-regional traffic modelling - and further to the trip distribution analysis below indicating potential trips being generated to the Local Route - it may be the case that the Intermodal trip generation to the Local Route has been specifically restricted as part of modelling analysis, potentially based on the weight restriction issue outlined above.

6.3.2 Moorebank Avenue Future Capacity Constraints

Looking more holistically at the issue of Intermodal trip distribution, discussions with LC Council indicate that LC Council has [recently] requested that the traffic assessment for the MIC Intermodal specifically include an assessment of "the" or "a" southern route, i.e. Intermodal trip distribution to the Local Route. This is seen as essential as the key intersections along the **Regional Route** (and specifically Moorebank Avenue to the M5 Interchange and Hume Highway/Motorway) are reported in the SIMTA TIA as being at (and indeed significantly over) capacity further to the 1M TEU Intermodal alone.

For example, for PM trips **to** the south and south-west (i.e. trips for which the Local Route provides an alternative) the SIMTA TIA reports an average delay of 120 seconds to travel north through the intersection of Anzac Road, and then an average delay of 283 seconds to access the westbound slip lane from Moorebank Avenue to the M5 as shown in **Table 6.3.2.1** below.

Table 6.3.2.1 SIMTA TIA 2031 Reported Delays No Network Upgrades

Table 6-5 Level of Service Summary PM Peak (2031 Future Base Case with SIMTA)

Model :2031 PM with SIMTA

Intersection	Approach	Average Delay	LoS (Delay)	Average Delay	LoS
Moorebank Avenue-Anzac Road (Signal)	North	32	C	71	F
	East	105	F		
	South	120	F		
	North - Slip Lane	3	A		
M5 Motorway-Moorebank Avenue (Signal)	North - Right Turn	64	E	66	E
	North - Through	28	B		
	East	32	C		
	South - Right Turn	56	D		
	South - Through	53	D		
	West	36	C		
	North - Slip Lane	17	B		
	East -Slip Lane	30	C		
	South - Slip Lane	283	F		

Source: SIMTA TIA (Table 6.5)

Further to the suite of upgrade recommendations provided in the SIMTA TIA – principally at the Moorebank Avenue & M5 Interchange, and in Moorebank Avenue - the SIMTA TIA reports the following delays: -

Table 6.3.2.2 SIMTA TIA 2031 Reported Delays All Network Upgrades

Table 8-2 Intersection LoS Results – 2031 *Improve* Case

Intersection	AM Peak		PM Peak	
	Overall Average Delay	LoS	Overall Average Delay	LoS
Moorebank Avenue-Anzac Road (Signal)	41	C	52	D
M5 Motorway-Moorebank Ave (Signal)	34	C	66	E
Moorebank Ave-Northern Access (Signal)	13	A	16	B
Moorebank Ave-Central Access (Signal)	21	B	41	C
Moorebank Ave-Southern Access (Signal)	16	B	12	A

Source: SIMTA TIA (Table 8.2)

While the SIMTA TIA does not provide individual movement delays for the network upgrade forecast scenario reported in **Table 6.3.2.2** above, at the M5 Interchange the upgrades provide only 2 seconds average delay improvement; the potential exists that the high delays to key movements remain even further to the upgrade.

The SIMTA TIA also reports significant delays at the intersections along the Hume Highway south from the M5 but no intersection upgrades are proposed for these. Average delays at the intersection of Hume Highway & Kurrajong Road in the AM for example are reported at 294 seconds, and 220 seconds at the intersection of Hume Highway & De Meyrick Avenue. Primary delays at these intersections would be to the minor approaches, but even through movements would likely have significant delays based on such averages.

Perhaps most significantly, **the SIMTA TIA results are based only on the trip generation of a 1M TEU Intermodal**. The capacity 1.7M TEU Intermodal would theoretically provide some 70% additional capacity; while there may be some efficiencies (in regard to traffic and transport) arising from a joint venture, it is likely that even the full suite of network upgrades proposed in the SIMTA TIA would be unable to accommodate the trip generation of a 1.7M TEU Intermodal along the Regional Route without reporting delays the equal to or higher than reported for pre-upgrade conditions.

As such, it is almost inevitable that traffic capacity will need to be found elsewhere to alleviate delays along Moorebank Avenue north from the Intermodal (and hence the nexus between the Intermodal and the bridge to replace the Causeway by successive State Governments - see **Section 2.5** of the TIA); a route to the south – where more than 50% of heavy vehicle trips and almost 40% of staff vehicle trips have their origin/destination – appears inevitable.

6.4 Distribution Routes

6.4.1 Intermodal to/from the "South"

The SIMTA TIA limits the 1M TEU Intermodal trip generation to "The South" to 5% of rigid trips and 5% of staff trips. While the SIMTA TIA does not provide any further information in regard to these trips (i.e. after they leave Moorebank Avenue to – necessarily – Cambridge Avenue) these trips have likely been assessed as travelling to/from Canterbury Road and then south towards Campbelltown).

6.4.2 Intermodal to/from Campbelltown Road

The SIMTA TIA assigns 13% of both articulated and car trips, and 10% of rigid trips, to the Hume Highway **south** of the M5 Motorway. In response to CC Council identifying in their submission the high percentage of trips to be generated by the 1M TEU Intermodal to the south and south-west, the SIMTA Submissions Report states: -

> *As identified in the Freight Demand Modelling report, the freight catchment that is serviced by the SIMTA proposal is located largely to the north and west of the SIMTA site. The Macarthur Intermodal Shipping Terminal services the freight catchment that the Campbelltown LGA is located within.*

This statement would seem contradictory to the distribution profile identified in the SIMTA TIA, with the majority of heavy vehicle trips generated by the 1M TEU Intermodal in fact travelling to/from the south and south-west. In addition, the SIMTA Submissions Report provides the following: -

It is also noted that the trip to access the Hume Highway, heading north-west from the SIMTA site, via Cambridge Avenue and Glenfield Road is a distance of approximately 11 km, while the trip via the Hume Highway via Moorebank Avenue and the M5 Motorway is approximately 3 km. There would be no incentive for vehicles to take the longer route.

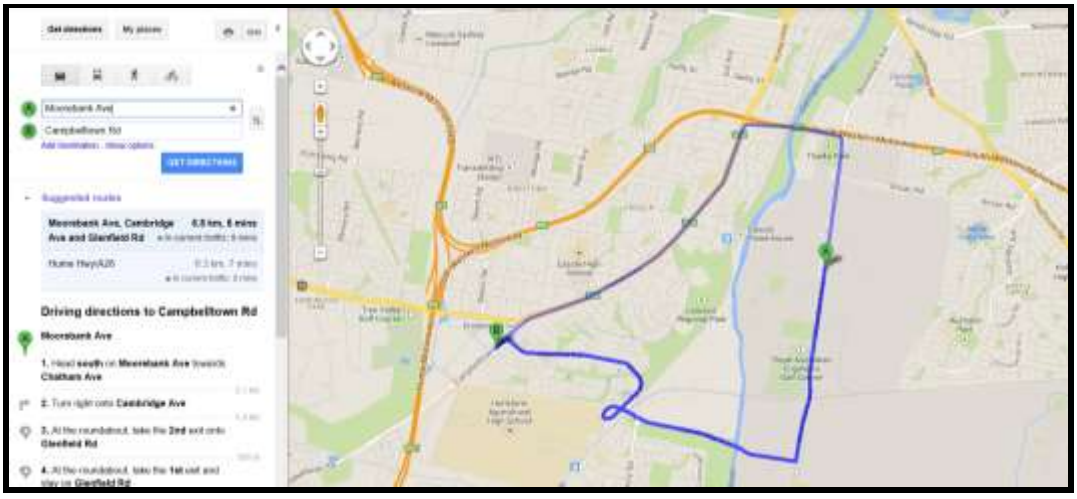
This response does not address the issue raised – the potential for Intermodal vehicles to use the Local Route to travel to the Hume Highway south of the M5.

Following the Hume Highway south from the M5, the only origins/destinations are Campbelltown Road and Camden Valley. Trips to/from Camden Valley Way would represent only a very minor percentage of demand (if any), while Campbelltown Road and its access to significant industrial precincts and residential suburbs is the only apparent origin/destination for these trips, and necessarily a point in Campbelltown Road south of Glenfield Road (as there is no demand generator between Hume Highway/Camden Valley Way and Glenfield Road).

There is significant evidence to suggest that these Intermodal trips would use the Local Route rather than the Regional Route.

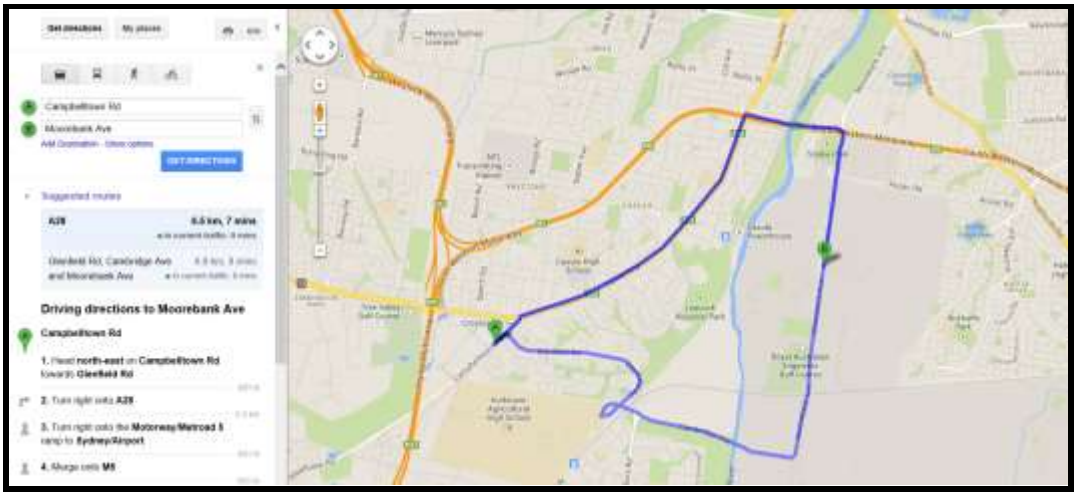
Base travel time summaries have been prepared for the available routes between Campbelltown Road (south of Glenfield Road) and the Intermodal (centred on the signalised Defence National Storage Distribution Centre intersection with Moorebank Avenue) using the Google Maps *Get Directions* tool. While acknowledging from the outset that this tool is not infallible, it provides a more than valid tool by which to provide a preliminary assessment of the available routes, as shown in the figures below.

Figure 6.4.2.1 Trip Times Intermodal to Campbelltown Road



Source: Google Maps

Figure 6.4.2.2 Trip Times Campbelltown Road to Intermodal



Source: Google Maps

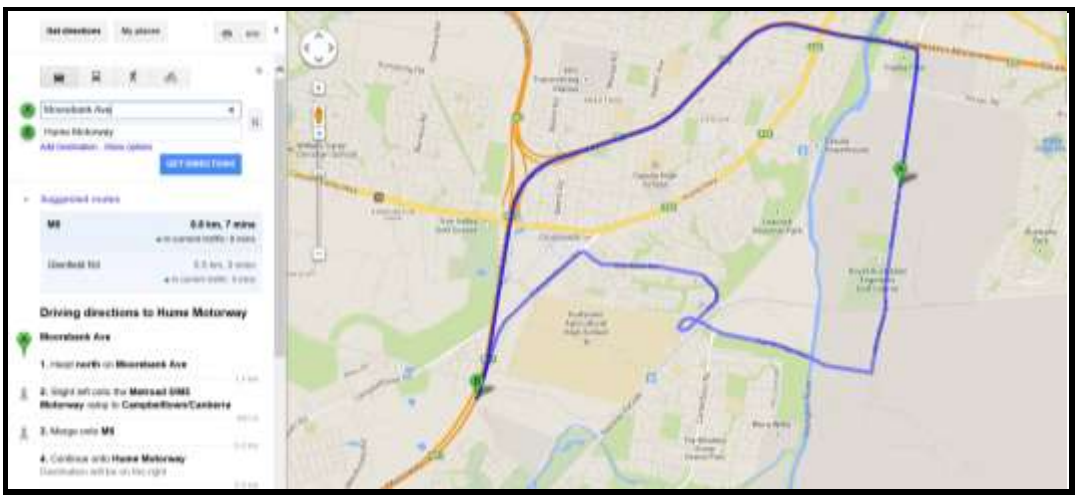
As shown in the figures above, there is little difference in the base travel times between the Intermodal and Campbelltown Road south of Glenfield Road via the Regional Route or the Local Route.

6.4.3 Intermodal to/from Hume Motorway

The SIMTA TIA assigns 41% of articulated trips, 35% of rigid trips and 18% of car trips to the Hume Highway south of the M5 Motorway. Again, there is evidence to suggest that these trips would use the Local Route, and specifically for the outbound trip (Intermodal to Hume Motorway) given the availability of the Campbelltown Road on-ramp to the Hume Motorway south of Glenfield Road.

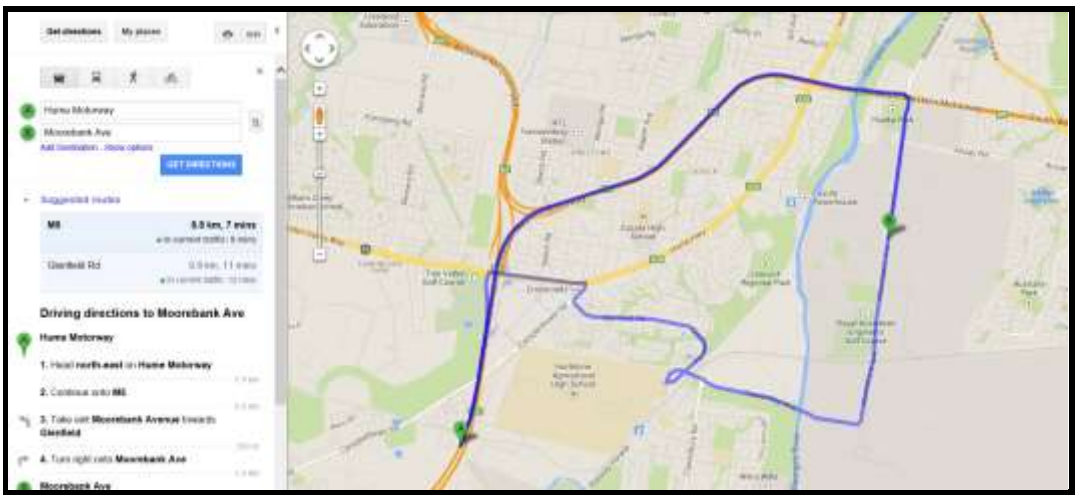
The routes from the Intermodal to the Hume Motorway; and from the Hume Motorway to the Intermodal, are shown below.

Figure 6.4.3.1 Intermodal to Hume Motorway



Source: Google Maps

Figure 6.4.3.2 Hume Motorway to Intermodal



Source: Google Maps

For arrival trips (Hume Motorway to Intermodal) the Regional Route is significantly faster than the Local Route, while for the departure trip (Intermodal to Hume Motorway) the difference is again minor between the Regional Route and the Local Route.

6.5 Future Travel Times

In determining the likelihood for trips to move from the SIMTA TIA identified Regional Route to the Local Route, it is necessary to consider base travel times (as estimated in **Section 6.4** above) and then also examine future delays along each route as those delays will be the primary driver of route change.

In this regard, the assessment below is based on the following: -

- The SIMTA TIA identified delays to key through and turning movements at the intersections along the Regional Route in 2031

- Delays to key through and turning movements at the intersections along the Local Route, based on SIDRA modelling of the forecast 2024 traffic flows provided in this TIA plus the peak trip generation of a 1M TEU Intermodal to the routes identified above, i.e. to and from Campbelltown Road south of Glenfield Road.

- Delays to key through and turning movements at the intersection of Campbelltown Road & Glenfield Road, and Campbelltown Road & Beech Road, based on SIDRA modelling of the forecast 2036 traffic flows provided in the CR REF STA and the peak trip generation of a 1M TEU Intermodal to the routes identified above, i.e. to and from Campbelltown Road south of Glenfield Road.

From the outset, it is acknowledged that the movement delays reported further to this analysis method along the Local Route, even with all known development including the 1M TEU Intermodal, still at their base represent a forecast year 2024. However: -

- The potential for any significant additional growth along the Local Route other than that generated by targeted developments such as those included in the assessment is minimal. Reference to the AADT and ADT data in **Section 3** above shows little growth along the route over the past 10 years, and there is no indication that average annual growth would in the future increase from existing levels. Other than at the intersection of Campbelltown Road & Glenfield Road (which is modelled based on 2036 flows) there is no information to suggest that 2031 flows along the Local Route would be significant different from those forecast for 2024.

- Moreover, the analysis provided below is designed to show the **potential** for Intermodal trips to use the Local Route. While it is outside of the scope of this TIA to prepare detailed sub-regional modelling to examine the unrestricted distribution of the Intermodal to/from key south and south-west locations, it is nonetheless important to examine the potential for such to be greater than the 5% of staff and rigid trips assigned in the SIMTA TIA, particularly given the assignment of more than 50% of heavy vehicle trips and almost 40% of staff trips to the south and south-west.

6.5.1 Intersection Delay Analysis

With reference to the SIMTA TIA, CR REF STA and the SIDRA analysis provided in **Appendix B** of this TIA, it is possible to identify the delay increases for specific turning/through movements for "a" forecast year comparable with the SIMTA TIA forecast year 2031. These delays (in seconds) are summarised below; for reference: -

- **BLACK** delays are taken from the SIMTA TIA for the year 2031 without upgrades
- **RED** delays are also derived from the SIMTA TIA for the year 2031 without upgrades but represent only Average Delays for the whole intersection (as available)
- **BLUE** delays are taken from **Appendix B** of this TIA and represent 2024 Local Route delays further to the introduction of trips from known projects and a 1M TEU Intermodal
- **PURPLE** figures are based on SIDRA modelling of the 2036 flows provided in the CR REF STA with the addition of a 1M TEU Intermodal trips.

Again, the delays along the Local Route include the peak potential trip generation of a 1M TEU Intermodal to/from Campbelltown Road south of Glenfield Road; and to the Hume Motorway via the Campbelltown Road on-ramp south of Beech Road. These peak flows are examined in **Section 6.6** below.

Table 6.5.1.1 Future Intersection Movement Delays

Key Movement	AM Delay (s)	PM Delay (s)
Moorebank & Anzac Northbound	44	120
Moorebank & Anzac Southbound	102	32
M5 & Moorebank South to West	65	283
M5 & Moorebank West to South	40	36
M5 & Hume South to East	163	172
M5 & Hume East to South	50	86
Hume & CVW Average	80	69
Hume & Kurrajong Average	294	77
Hume & De Meyrick	220	22
Campbelltown & Glenfield North to South	20	17
Campbelltown & Glenfield South to North	47	7
Campbelltown & Glenfield East to South	12	46
Campbelltown & Glenfield South to East	64	94
Glenfield & Brampton East to West	25	26
Glenfield & Brampton West to East	22	24
Glenfield & Hurlstone East to West	6	9
Glenfield & Hurlstone West to East	10	14
Cambridge & Glenfield East to West	5	7
Cambridge & Glenfield West to East	26	7
Moorebank & Cambridge North to West	6	39
Moorebank & Cambridge West to North	27	6
Campbelltown & Beech South to North	34	35
Campbelltown & Beech North to South	41	51

Source: SIMTA TIA and CR REF STA and ARC

The high AM average intersection delay at Hume Highway & Kurrajong Road and Hume Highway & De Meyrick Avenue would not appropriately represent the additional delay to through movements in the Hume Highway, which would be prioritised. With reference to reported delays at surrounding intersections, it is estimated that there is the potential for the through movement delays at these intersections to average 40 seconds (northbound and southbound) in the AM, and average 20 seconds (northbound and southbound) in the PM.

ARC notes that the CR TTMA does not provide any flows or analysis in regard to the intersection of Hume Highway & Camden Valley Way & Campbelltown Road by which to better inform this analysis. As such, the key movements – Hume Highway to Campbelltown Road, and Campbelltown Road to Hume Highway, have been assigned delays of 40 seconds in both the AM and PM.

6.5.2 Total Trip Route Times

Looking at the trip route options for the southern and south-western origins/destinations identified in **Section 6.4**, and including the base travel times (**Section 6.4**) and movement delays (**Section 6.5**) provides a basic summary of estimated total future travel times between the Intermodal and the south and south-west.

Table 6.5.2.1 AM Travel Times

Origin AM	Destination AM	Route	Distance	Time	Time + Traffic	Delay along Route	Future Time	Future Time + Traffic
Intermodal	Campbelltown Road south of Glenfield Road	Local Route	6.8	8	8	55	8.9	8.9
		Regional Route	6.3	7	8	299	12.0	13.0
Campbelltown Road south of Glenfield Road	Intermodal	Local Route	6.8	8	8	149	10.5	10.5
		Regional Route	6.5	7	9	472	14.9	16.9
Intermodal	Hume Motorway south of Campbelltown Road	Local Route	8.6	9	9	96	10.6	10.6
		Regional Route	8.8	7	8	109	8.8	9.8

Table 6.5.2.2 PM Travel Times

Origin PM	Destination PM	Route	Distance	Time	Time + Traffic	Delay along Route[1]	Future Time	Future Time + Traffic
Intermodal	Campbelltown Road south of Glenfield Road	Local Route	6.8	8	8	127	10.1	10.1
		Regional Route	6.3	7	8	586	16.8	17.8
Campbelltown Road south of Glenfield Road	Intermodal	Local Route	6.8	8	8	144	10.4	10.4
		Regional Route	6.5	7	9	327	12.4	14.4
Intermodal	Hume Motorway south of Campbelltown Road	Local Route	8.6	9	9	178	12.0	12.0
		Regional Route	8.8	7	8	403	13.7	14.7

6.5.3 Trip Time Summary

With reference to the tables above: -

- Intermodal to/from Campbelltown Road

  In both peaks, the Local Route between the Intermodal and Campbelltown Road (and vice versa) is potentially faster than the Regional Route, a result of the increased delays forecast along the Hume Highway north of Camden Valley Way; at the M5 & Moorebank Avenue Interchange; and southbound in Moorebank Avenue through Anzac Road. Moreover, for most drivers arriving from or departing to Campbelltown Road south of Glenfield Road, the Local Route would be a more legible route.

- Intermodal to Hume Motorway

  In the PM, the Local Route between the Intermodal and the Hume Motorway (via the Campbelltown on-ramp) is potentially faster than the Regional Route. While the base times for both routes are similarly, the key difference is the SIMTA TIA identified delays to northbound trips in Moorebank Avenue through Anzac Road; and to westbound trips from Moorebank Avenue to the M5.

Even without consideration of the additional delays at the key northern intersections in Moorebank Avenue further to the 1.7M TEU Intermodal, the analysis above indicates that travel times along the Local Route will potentially be as fast if not faster than the travel times along the Regional Route for the following trips: -

- Intermodal to/from Campbelltown Road in the AM and PM
- Intermodal to Hume Motorway in the PM

6.6 Intermodal Trip Generation to the Local Route

The 1.7M TEU Intermodal trip potential to the Local Route further to the analysis provided above is detailed in the rolling tables below, with figures in **RED** taken directly from the SIMTA TIA. The SIMTA Environmental Assessment states staff numbers of up to 2,840 for the 1M TEU Intermodal, but the primary analysis below uses the base 2,258 staff estimated used in the SIMTA TIA.

In all cases, the characteristics of the 1.7M TEU Intermodal have been assessed as being 70% higher than the 1M TEU Intermodal described in the SIMTA TIA.

Table 6.6.1 1.7M TEU Intermodal Daily Trips

1.7M TEU Intermodal Daily Trips	Articulated	Rigid	Cars	Total Trips
Articulated 1M TEU	**1603**			
Articulated 1.7M TEU	**2725**			
Rigid 1M TEU		**1035**		
Rigid 1.7M TEU		**1760**		
Staff 1M TEU			2258	
Staff 1.7M TEU			3839	
Car Driver			80%	
Vehicle trips per Day	**2725**	**1760**	**6142**	**10626**

Table 6.6.2 1.7M TEU Intermodal Peak Hour Trips

1.7M TEU Intermodal Peak Trips	Articulated	Rigid	Cars	Total Trips
AM Peak % of Daily	7.70%	7.70%	19.15%	
Vehicle Trips Per Hour	**210**	**135**	**1176**	**1521**
PM Peak % of Daily	9.30%	9.30%	17.44%	
Vehicle Trips Per Hour	**253**	**164**	**1071**	**1488**

Table 6.6.3 1.7M TEU Intermodal Local Route Accessible Trips (No Restricted Access Vehicles)

1.7M TEU Intermodal Local Route Accessible Trips (No RAVs)	Articulated	Rigid	Cars	Total Trips
Daily Trips	70%	100%	100%	
Vehicle trips per Day	**1908**	**1760**	**6142**	**9809**
AM Peak % of Daily	7.70%	7.70%	19.15%	
Vehicle Trips Per Hour	**147**	**135**	**1176**	**1459**
PM Peak % of Daily	9.30%	9.30%	17.44%	
Vehicle Trips Per Hour	**177**	**164**	**1071**	**1412**

Table 6.6.4 1.7M TEU Intermodal Arrival & Departure Profile

1.7M TEU Intermodal Arrival & Departure Profile	Articulated	Rigid	Cars	All Vehicles
AM Arrival TIA %	50%	50%	90%	
Vehicle trips per Hour	**73**	**68**	**1059**	**1200**
AM Departure TIA %	50%	50%	10%	
Vehicle trips per Hour	**73**	**68**	**118**	**259**
PM Arrival TIA %	50%	50%	20%	
Vehicle trips per Hour	**89**	**82**	**214**	**385**
PM Departure TIA %	50%	50%	80%	
Vehicle trips per Hour	**89**	**82**	**857**	**1027**

Table 6.6.5 1.7M TEU Intermodal SIMTA TIA Assigned Southern Trips

1.7M TEU Intermodal SIMTA TIA Assigned Southern Trips	Articulated	Rigid	Cars	All Vehicles
Distribution to/from Southern Route	0%	5%	5%	
AM Peak	**0**	**7**	**59**	**66**
Arrival vehicle trips	0	3	53	56
Departure vehicle trips	0	3	6	9
PM Peak	**0**	**8**	**54**	**62**
Arrival vehicle trips	0	4	11	15
Departure vehicle trips	0	4	43	47

Table 6.6.6 1.7M TEU Intermodal to/from Campbelltown Road via Local Route Trip Potential

1.7M TEU Intermodal to/from Campbelltown Road via Local Route Trip Potential	Articulated	Rigid	Cars	All Vehicles
Distribution to Campbelltown Road	13%	10%	13%	
AM Peak Total vehicle trips	**19**	**14**	**153**	**186**
Arrival vehicle trips	10	7	138	154
Departure vehicle trips	10	7	15	32
PM Peak Total vehicle trips	**23**	**16**	**139**	**179**
Arrival vehicle trips	12	8	28	48
Departure vehicle trips	12	8	111	131

Table 6.6.7 1.7M TEU Intermodal to Hume Motorway via Local Route Trip Potential

1.7M TEU Intermodal to Hume Motorway via Local Route Trip Potential	Articulated	Rigid	Cars	Al Vehicles
Distribution to Hume Motorway	41%	35%	18%	
AM Peak Total vehicle trips	60	47	212	**319**
Arrival vehicle trips	0	0	0	0
Departure vehicle trips	30	24	21	75
PM Peak Total vehicle trips	73	57	193	**323**
Arrival vehicle trips	0	0	0	0
Departure vehicle trips	36	29	154	219

Table 6.6.8 1.7M TEU Intermodal Total Trip Potential to/from Local Route (SIMTA TIA Staff)

1.7M TEU Intermodal Total Trip Potential to/from Local Route SIMTA TIA Staff Estimate	Articulated	Rigid	Cars	All Vehicles
AM Peak				
Arrival	10	10	191	210
Departure	40	34	42	116
TOTAL	49	44	233	**326**
PM Peak				
Arrival	12	12	39	62
Departure	48	41	308	397
TOTAL	59	53	347	**460**

Table 6.6.9 1.7M TEU Intermodal Total Trip Potential to/from Local Route (SIMTA EA Staff)

1.7M TEU Intermodal Total Trip Potential to/from Local Route SIMTA EA Staff Estimate	Articulated	Rigid	Cars	All Vehicles
AM Peak				
Arrival	10	10	240	259
Departure	40	34	53	127
TOTAL	49	44	293	**386**
PM Peak				
Arrival	12	12	48	72
Departure	48	41	388	477
TOTAL	59	53	436	**549**

6.7 Intermodal Flow Forecasts

Based on the broader SIMTA TIA origins and destinations, and with the application of the potential trip generation via the Local Route as detailed in **Section 6.5**, the potential 1.7M TEU Intermodal trips to key intersections along the Local Route are shown in the figures below.

Figure 6.7.1 AM Intermodal (1.7M TEU Intermodal SIMTA TIA Staff Estimate)

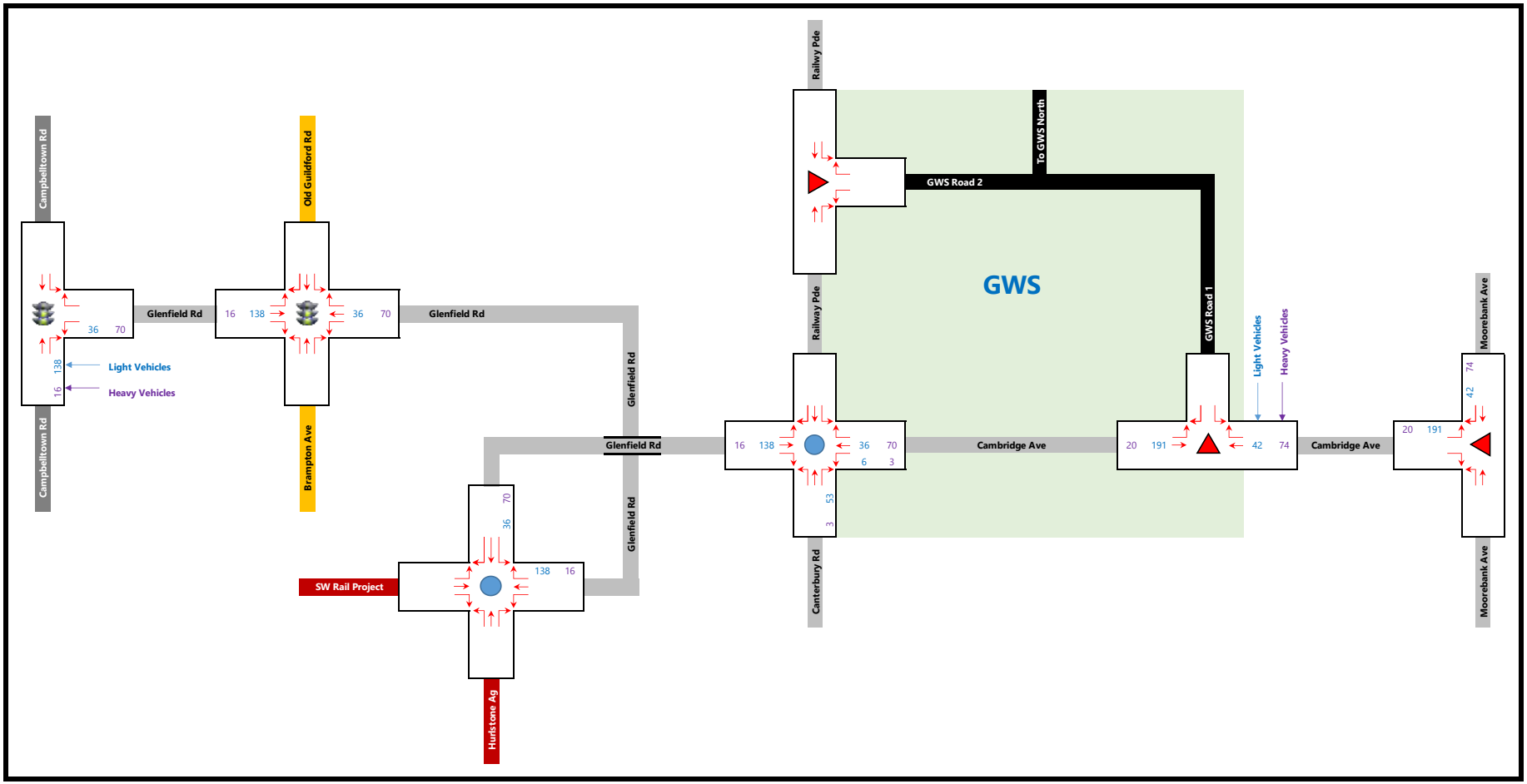
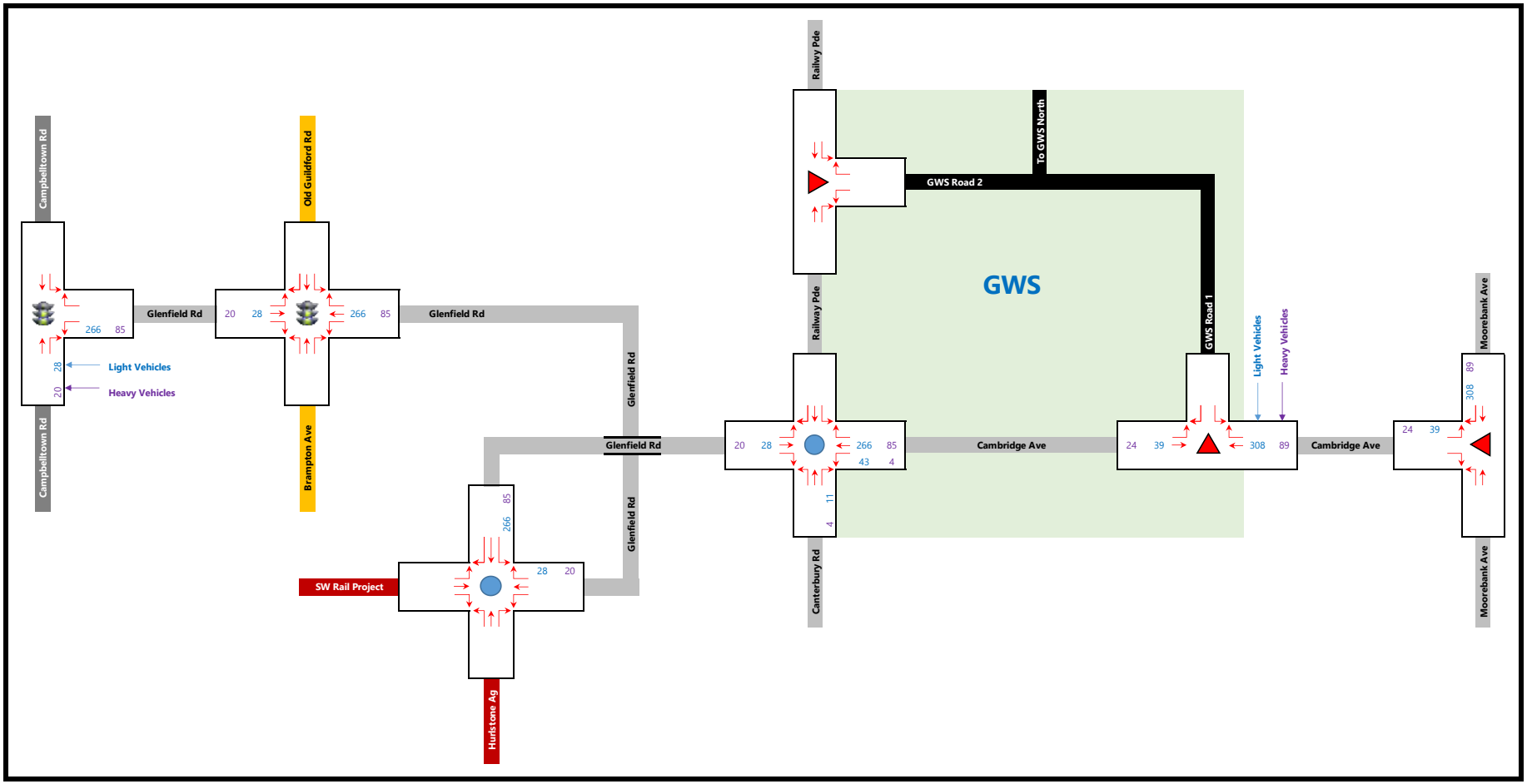


Figure 6.7.2 PM Intermodal (1.7M TEU Intermodal SIMTA TIA Staff Estimate)



6.8 Intermodal Summary

6.8.1 Intermodal Local Route Impacts

As part of the delay time assessment detailed in **Section 6.5**, preliminary SIDRA analysis of the Local Route intersections (**2024 plus the 1M TEU Intermodal, SIMTA TIA Staff**) reports that most intersections continue to perform at acceptable Levels of Service, though many have little spare capacity, and 95%ile queue lengths in some instances increase significantly.

Additional sensitivity testing using the SIMTA EA staff estimate and a 1.7M TEU Intermodal suggests that all intersections operate at a poor LoS with the exception of Cambridge Avenue & Canterbury Road & Glenfield Road & Railway Parade. Under this scenario, flows on the Causeway would also exceed 2,300vph in the PM, with a westbound flow of over 1,800vph.

Notwithstanding, the distribution of Intermodal trips to Local Route could in turn reduce delays along the Regional Road, particularly for key movements such as Moorebank Avenue south to M5 west. As such, there is likely to be some sort of balance in the future between the routes, but such could only be determined with further sub-regional modelling.

Finally, and further to the above, it must be acknowledged that the distribution of the smaller number of 1M TEU Intermodal trips as per the SIMTA TIA (5% of rigid and 5% of staff vehicles) has little if any impact on the Local Route.

6.8.2 Intermodal Conclusions

The potential Intermodal trip generation and distribution detailed above has been prepared further to discussions with CC Council, the RMS and TfNSW to provide an overview of sub-regional traffic generating development potential as appropriate to this TIA. As per our discussions with TNSW, further detailed traffic assessments will be required prior to any development commencing on the Intermodal, and specifically an assessment based on the full capacity of the Intermodal.

The outcomes of these future assessments cannot be determined at this time, and as such ARC has not provided a detailed assessment of the impacts of these additional flows on the local road network concurrent to the Proposal, as the range of potential Intermodal trips is simply too great to assign with appropriate certainty.

Attachment 2.3

Traffic and Transport Report

AECOM

25 May 2012

Glenfield Waste Services Rezoning

Traffic and Transport Review

Glenfield Waste Services Rezoning

Traffic and Transport Review

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Quality Information

Document Glenfield Waste Services Rezoning

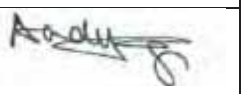
Ref 60267281

Date 25 May 2012

Prepared by Riley Dayhew

Reviewed by Dan Riley

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
1	25-May-2012	Draft Traffic and Transport Review	Andy Yung Principal Transport Planner	

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1.0 Introduction

AECOM has been engaged by L.A Kennett Enterprises to undertake a traffic and transport review of a 60ha site within the Glenfield Waste Services operational land area in support of a rezoning submission report for Campbelltown City Council (Council). This will form part of Council's preparation of a Standard Instrument Local Environmental Plan (SILEP) for the Campbelltown LGA.

This report will review existing traffic and transport conditions surrounding the site, as well as provide detail on the likely future traffic conditions of the local road network, including impacts arising from surrounding development. The potential traffic and transport impacts of rezoning land on the site will be considered, and potential use of public and active transport discussed.

This report has been prepared in advance of collecting traffic data or undertaking quantitative analysis. A detailed traffic impact assessment will be required at the development application stage.

1.1 Study Area

1.1.1 Description of subject site

The Glenfield Waste Services land is 100ha overall and includes a licenced non-putrescible waste facility which was first granted consent for use in 1979. The facility includes recycling operations, a quarry, weigh bridge and site offices. The land is divided by a local government area boundary, with 40ha of land to the north located within the Liverpool City Council LGA and the remaining 60ha (the site) within the Campbelltown City Council LGA.

Note that "the site" that this report considers only includes the 60ha southern portion of Glenfield Waste Services land and this is highlighted in **Figure 1**. The site is bordered to the west by the Southern railway line, to the north by the Liverpool City Council LGA boundary, to the east by the Georges River, and to the south by residential housing around Goodenough Street.

In terms of operations, the recycling and administration element of Glenfield Waste Services is located on the 60ha site (the current land fill area is located in the remaining 40ha area north of the site in the Liverpool City Council LGA). The site also includes an area adjacent to Georges River currently zoned "6 (b) Regional Open Space". Under the SILEP, a portion of the area will be re-zoned "RE1 Public Recreation" (the extent of which is not known and has been estimated at 3.0ha). A large residential property also exists on the site, as well as transmission lines, which run through the site south of Cambridge Avenue.

Primary access to all 100ha of land (including the site) is provided from Cambridge Avenue, a main road linking Glenfield with Holsworthy and Moorebank. A secondary access is located off Railway Parade, which is not used to access Glenfield Waste Services, but to provide service access to the rail line for Railcorp and access to the single residential property.

Figure 1: Site Area

Source: EPS, 2012

1.1.2 Surrounding land uses

The site is fairly isolated from surrounding land uses by natural vegetation around the Georges River and Leacock Regional Park, which adjoins the main southern railway line. Further past these natural buffers, army barracks are located to the east, with residential development in the west and south. Glenfield railway station and a small retail area are located approximately 1 km from the site. The site is bordered to the south by the Glenfield residential area. A buffer separating future development from the residential area will likely be retained in the form of the transmission lines easement.

1.2 Report structure

The report has been structured as follows:

- **Chapter 2** provides a summary of the existing traffic and transport conditions on the surrounding road network.
- **Chapter 3** details planned land uses and infrastructure in the surrounding area.
- **Chapter 4** outlines the rezoning proposal and the likely traffic generated as a result of the rezoning of the site.
- **Chapter 5** summarises the potential impacts arising from future traffic generation.
- **Chapter 6** provides the conclusions and recommendations of the study.

2.0 Existing Traffic and Transport Conditions

This chapter of the report summarises the existing travel behaviour and transport conditions in the vicinity of the study area based on background documents and site visits.

2.1 Existing travel behaviour

Journey to work (JTW) data includes details of the origin and destination of trips, together with characteristics of the journey such as mode of travel. JTW data from the 2006 census has been analysed to determine the current distribution of trips from the area and the proportion of mode of travel usage.

Given the use of the site is likely to be industrial uses, the mode splits for Travel zone 1261 (Minto) and North Campbelltown SLA (as a destination) have been considered to understand the likely travel behaviour should the rezoning take place at this site.

Analysis of the 2006 JTW destination data for Travel zone 1261 (Minto) and North Campbelltown SLA is summarised in **Table 1**.

Table 1: 2006 JTW mode split data for TZ 1261 and North Campbelltown SLA

Area	Total trips	Vehicle driver	Vehicle passenger	Bus	Train	Others *
TZ 1261	2,327	78%	8%	1%	5%	8%
North Campbelltown SLA	18,536	72%	8%	1%	4%	15%

*- including 'other modes', 'modes not stated' and 'worked at home or did not go to work'.

Source: BTS Journey-to-work data, 2006

According to the 2006 Census data, travel to both Minto and North Campbelltown SLA (as a journey to work destination) is characterised by the private motor vehicle, with over 80% of those trips are made by car as a driver or a passenger. Public transport use is low, which is especially the case for buses, although this could be attributed to low levels of public transport service frequency in many suburbs of Campbelltown and may not accurately reflect the existing travel behaviour at the site.

The South West Sub-regional Strategy identifies that on an average weekday 79 per cent of trips by South West residents are made by private vehicle, 8.1 per cent by public transport and 12.3 per cent by walking or cycling, which is consistent with the JTW data presented above.

2.2 Existing site access and operations

2.2.1 Site access

The site currently has two accesses at the following locations:

- Cambridge Avenue approximately 200m west of the Georges River Causeway.
- Railway Parade approximately 60m north of the Glenfield Road/Canterbury Road/Cambridge Avenue/Railway Parade Roundabout.

The location of both access points is shown in **Figure 2**. The access at Cambridge Avenue serves as the main access to the Glenfield Waste Services site and receives all staff and visitor traffic.

The Railway Parade access is not used by visitors or staff. This access is used to access the residential property and has been gazetted by RailCorp for rail maintenance and construction activities.

Figure 2: Site Access Location

Source: AECOM, 2012

2.2.2 Site operations

A visual audit undertaken by site operators in November 2010 determined that an average of approximately 84 trips per day were made by visitors in a normal operating year. During a busy year it has been observed that the number of visitor trips can rise to129 trips per day. The nature of operations at the Glenfield Waste Services site shows that visitor trips are spread out across the day, rather than focused on any particular peak period.

The type of vehicles accessing the site range from small cars to articulated trucks. The site is B-Double access approved to the west only via Cambridge Avenue and Glenfield Road (RMS, November 2011). Based on Austroads vehicle classifications, approximately 36% of vehicles accessing the site on weekdays are small vehicles or vans, while the remaining 64% are trucks and heavy vehicles (visual audit Nov 2010). This equates to an average of 49 heavy vehicles per day during an average operating year and approximately 75 heavy vehicles per day during a busy year. Note that on the weekend, the majority of vehicles accessing the site are small private vehicles.

Approximately 54% of vehicles accessing the Glenfield Waste Services site during the week arrive from the east via Moorebank Avenue and approximately 46% of vehicles accessing the Glenfield Waste Services site arrive from the west via Glenfield Road. The origin trip distribution on the neighbouring road network is shown in **Table 2**.

Table 2: Existing average trip distribution onto the adjacent road network

Road Network	Average number of customer trips to the site each weekday	Percentage of total customer trips to the site each weekday
M5 Highway	20	25%
M7 Highway	5	6%
Campbelltown Road	2	2%
Canterbury Road	7	9%
Glenfield Road	16	20%
Hume Highway	13	17%
Moorebank Avenue	43	54%
Railway Parade	13	16%

Source: Glenfield Waste Services, November 2011

The site has approximately 15 employees arriving at 6:00am and departing at 5:00pm. This represents a minimal overall impact upon the existing traffic network. Car parking is provided on-site for employees and customers visiting the site offices.

2.3 Road network

The site is located close to the intersection of the M5 Motorway and M7 Motorway and has good connectivity to the sub-regional road network (including the Hume Highway, Campbelltown Road and Camden Valley Way). These roads are classified as RMS State Roads. The site accesses the wider road network via Moorebank Avenue, Glenfield Road, Canterbury Road and Railway Parade. The surrounding road network context is highlighted in **Figure 3**.

2.3.1 The Motorway network

The M5 Motorway provides access to the Sydney CBD and the airport to the north of the site and to Campbelltown, the Southern Highlands and Canberra to the south. The nearest interchange to the M5 Motorway from the site is located at Camden Valley Way for traffic to and from all directions, except the southbound on-ramp at Campbelltown Road. Another interchange to the M5 Motorway is located at Moorebank Avenue.

The M7 Motorway provides access to Sydney's north and west. Vehicles can access the M7 Motorway via the interchange at Camden Valley Way.

2.3.2 Sub-regional road network

The Hume Highway, Camden Valley Way and Campbelltown Road form the sub-regional road network in the vicinity of the site that provides direct connections to the Sydney Motorway network described above. These roads also connect the site to major centres in Sydney's South West including Liverpool and Campbelltown / Macarthur.

2.3.3 Local road network

Moorebank Avenue provides connectivity from Cambridge Avenue to the M5 Motorway and Holsworthy. It is a Commonwealth owned, two lane road with a posted speed limit of 60km/h.

Glenfield Road is a two lane road with a posted speed limit of 60km/h, which provides connectivity from the Hume Highway and Campbelltown Road to the site via Cambridge Avenue. Glenfield Road also connects to the local road network on its eastern end via an overpass above the Southern railway line, feeding into a roundabout which provides access to Cambridge Avenue, Railway Parade and Canterbury Road. The roundabout has two lanes, giving it enough capacity to manage continued traffic growth in the local area.

Canterbury Road is a four lane road in the vicinity of the site, providing access from the intersection of Cambridge Avenue, Railway Parade and Glenfield Road, south through the residential area of Glenfield to Macquarie Fields.

Railway Parade provides local access to Glenfield railway station and the Glenfield local shops. It runs from the intersection of Glenfield Road, Cambridge Avenue and Canterbury Road in the north, to Macquarie Fields in a south westerly direction. It is a two lane collector road with a posted speed limit of 50 km/h.

Cambridge Avenue provides primary access to the site, and provides an important linkage between Glenfield and the Holsworthy/Moorebank area. It is a two lane road with a posted speed limit of 60 km/h. The causeway section of Cambridge Avenue over the Georges River, to the east of the site could act as a potential capacity constraint to this road if traffic continues to grow in the local area.

Figure 3 Road network context

Source: AECOM, 2012

2.3.4 Traffic volumes

The most recent available Annual Average Daily Traffic (AADT) data (2005) collected by the Roads and Maritime Services (RMS) at two locations near the site are described below:

- 15,903 vehicles per day - Moorebank Avenue adjacent to the railway crossing.
- 12,232 vehicles per day - Glenfield Road immediately to the north of the bridge.

Vehicle flows along Cambridge Avenue are likely to be similar to those on Moorebank Avenue, as the data collection point on Moorebank Avenue is located only 700m north of the intersection with Cambridge Avenue. These levels of traffic observed at Moorebank Avenue, Glenfield Road (and likely on Cambridge Avenue) are typical of a two lane road with some reserved road capacity to cater for additional traffic.

Traffic volume data has also been obtained from a Traffic and Transport Report for Glenfield Junction TA300 (prepared by Global Arc for Transport Infrastrcuture Development Corporation, 2009). **Table 3** shows 2008 AM and PM peak hour traffic flows along Railway Parade, Cambridge Avenue and Canterbury Road in both directions.

Table 3: Peak hour traffic flows (2008)

Location	AM peak (vehs/hr)		PM peak (vehs/hr)	
	NB / EB	SB / WB	NB / EB	SB / WB
Railway Parade (north of Trafalgar Street)	427	253	272	483
Cambridge Avenue (east of Canterbury Road)	1,240	209	310	1,022
Glenfield Road (west of Canterbury Road)	426	604	537	477
Canterbury Road (south of Cambridge Street)	1,332	285	457	1,068

Source: Global Arc, 2009

The traffic data shows a large amount of traffic on Cambridge Avenue in the peak hours, however the hourly traffic volumes still fall within the general capacity of a two-way two-lane road (approximately 1,500 vehs/hr per lane, Austroads Standards). Significant spare capacity is experienced on Canterbury Road as this is a four lane road (with two lanes in each direction).

The report also highlights that the intersection of Glenfield Road / Canterbury Road / Cambridge Avenue performs acceptably at LoS B and A in the AM and PM peak hours respectively. The intersection also operates with spare capacity in both peak hours; approximately 28 per cent in the AM peak hour and 56 per cent in the PM peak hour.

Traffic in the area was observed as free flowing during the morning peak hour in May 2012, with the majority of vehicles travelling in an easterly direction along Cambridge Avenue toward Moorebank Avenue. It was also noted during site visits that traffic outside the peak hours was relatively light.

2.4 Public transport

2.4.1 Train services

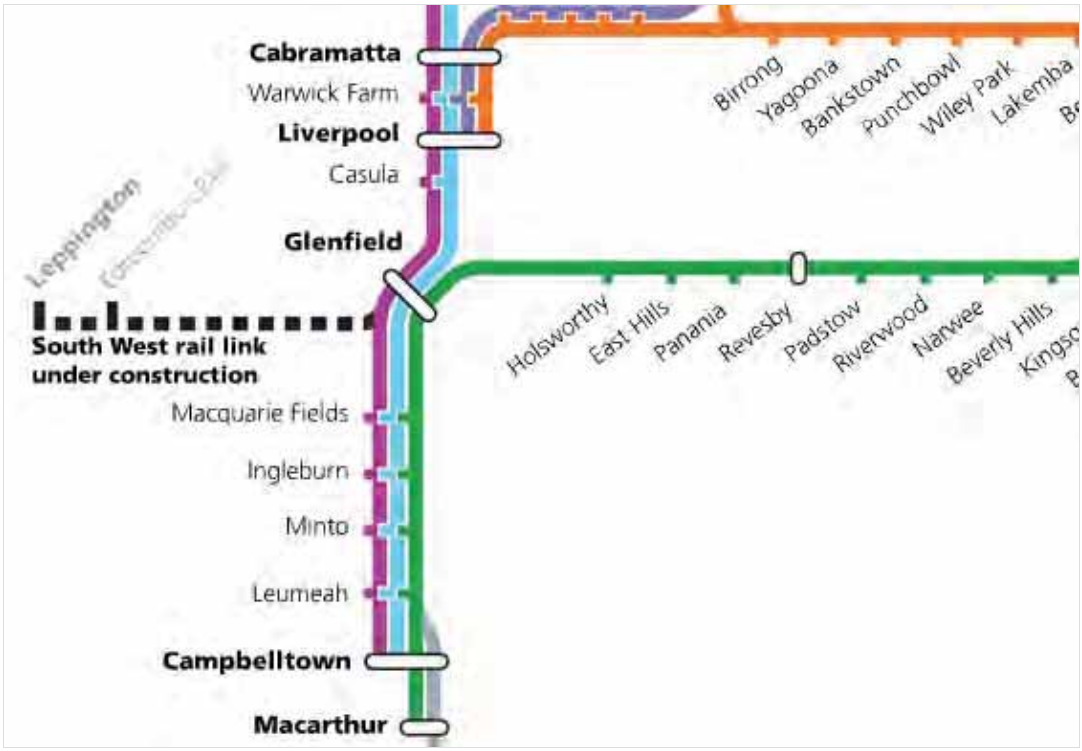
Glenfield railway station is located approximately 1km from the site (1.9km from the Cambridge Avenue site access), providing connectivity to the wider Cityrail network. As illustrated in **Figure 4**, the station is located at the interchange of three railway lines, including:

- The South Line (Campbelltown to City Circle via Granville).
- The Cumberland Line (Campbelltown to Blacktown).
- The Airport and East Hills Line (Macarthur to City Circle via East Hills and Sydney Airport).

These lines provide access from Glenfield to the wider rail network including Campbelltown / Macarthur, Liverpool, Cabramatta, Parramatta, Strathfield, the Airport and the CBD.

Glenfield is regularly serviced by trains during peak hours, with approximately 35 city bound services between 6 am and 9am. Services on the South and Airport/East Hills lines operate with a 10 minute frequency in each direction. Services on the Cumberland line generally operate with a 30 minute frequency in each direction.

Figure 4: Glenfield Station on the Cityrail network



Source: CityRail website, 2012

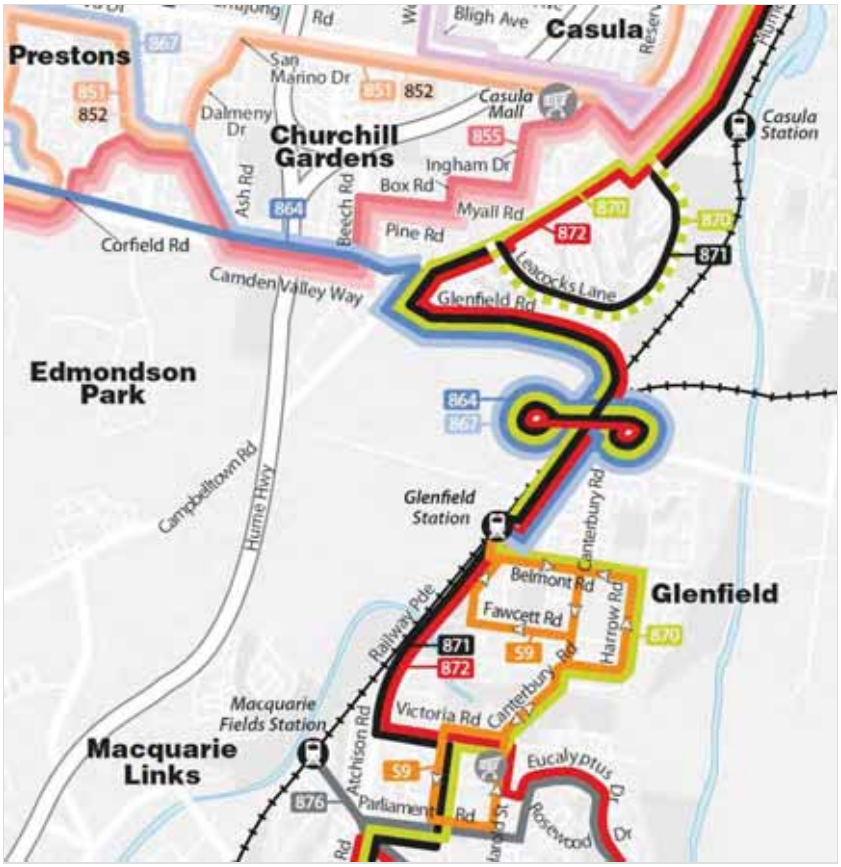
2.4.2 Bus services

Bus services in the Glenfield area are provided by Busabout and Interline and are shown in **Figure 5**. There are no bus routes operating along Cambridge Avenue. The five bus routes currently serving the site operate from Railway Parade, with bus stops located approximately 300m south of the site's Railway Parade access. These services are shown below:

- Route 864 Carnes Hill – Glenfield via Horningsea Park.
- Route 867 Prestons – Glenfield via Prestons.
- Route 870 Campbelltown – Ingleburn – Liverpool via Harrow Road and Glenfield.
- Route 871 Campbelltown – Ingleburn – Liverpool via Glenfield and Leacocks Lane.
- Route 872 Campbelltown – Ingleburn – Glenfield – Liverpool via Macquarie Fields .

In general, these bus routes are providing half hourly services during the peak hours to Campelltown, Liverpool, Ingleburn, Prestons and Carnes Hill.

Figure 5: Bus services in the Glenfield area



Source: Busabout, 2012

2.5 Pedestrian and cycle facilities

2.5.1 Pedestrian

There is a low provision of pedestrian facilities in the vicinity of the site. Georges River and the Holsworthy Barracks act as a natural barrier to walking at the eastern end of the site. However, Glenfield Station and the local shops are located within an approximately 15 to 20 minute walk from the site.

Footpaths are located along parts of nearby roads, including Railway Parade and Canterbury Road, providing access to the railway station, retail and other residential areas. There is currently an underpass leading from the site travelling beneath Cambridge Avenue that connects north of Cambridge Avenue to south of Cambridge Avenue. Pedestrian connectivity from the site to Glenfield Rail Station would need to be improved to meet the needs of any intensified land use on the site.

2.5.2 Cycle

The site is well located in terms of opportunities for cycling, being located close to the Liverpool-Parramatta Rail Trail and the M7 Motorway Cycleway. Together these cycleways provide approximately 60km of cycleways through Western Sydney.

Observations from site visits indicate that there are limited cycling activities in the local area. A low provision of cycle facilities in the Glenfield area means cyclists either share footpaths with pedestrians or cycle on-road. According to Council's Bike Plan, an on-road route exists along Glenfield Road from its intersection with Campbelltown Road, although no road markings exist along the route. An off-road route does exist at the southern end of Glenfield near Canterbury Road, running to Macquarie Fields. Other more informal routes also exist to the east of the Glenfield residential area, adjacent to the Georges River.

2.6 Summary

Based on a desktop review of available information and site observations, the following traffic and transport opportunities and constraints in the vicinity of the site are observed:

- Heavy reliance on cars in the North Campbelltown area, especially trips made to this area as a destination. This is consistent with the Draft South West Sub-regional Strategy in which it is identified that 79 per cent of trips are made by private vehicle in the South West.
- Good connectivity and direct access to Sydney's Motorway Network and the surrounding sub-arterial road network.
- Spare capacity on the surrounding local road network with flexibility of upgrading the local road network such as Cambridge Avenue to cater for some future traffic growth.
- Spare capacity at the key intersection of Glenfield Road / Canterbury Road / Cambridge Avenue / Railway Parade to cater for future traffic growth in the area.
- Good access to rail and bus services at Glenfield Station.
- Access to regional cycleway infrastructure that provides a more sustainable alternative mode of travel.
- Low provision of walking facilities in the area.

3.0 Planned Land Use & Infrastructure

This section of the report considers the strategic employment, land use and transport direction for the South West, planned development and potential infrastructure upgrades in the vicinity of the site and how these planned activities would affect / benefit the proposed rezoning of the site.

3.1 Strategic direction for the South West

3.1.1 Draft South West Sub-regional Strategy

The Draft South West Sub-regional Strategy identifies an employment capacity target of 89,000 additional jobs by 2031 in the South West Sub-region. This target is broken down for the four main LGAs within the South West; Liverpool LGA (35,000 additional jobs), **Campbelltown LGA (26,000 additional jobs)**, Camden LGA (26,000 additional jobs) and Wollondilly LGA (2,000 additional jobs).

The Draft Strategy also identifies that the South West is one of two sub-regions with strongly growing industrial activities. It identifies that the Glenfield Waste Centre on Cambridge Avenue could provide Employment Land for light manufacturing, local industry and urban services.

The Draft Strategy has also identified the need to encourage growth in jobs and services in or around existing or proposed centres within the South West sub-region in order to reduce the need for cross regional trips and to reduce the need to travel by private vehicle.

In response to this, key directions for transport in the South West Sub-region have been developed including improving transport between Sydney's Centres.This includes the planned South West Rail Link (SWRL) that will connect the South West Growth Centre (SWGC) to the existing rail network at Glenfield. This connection to Glenfield will reinforce the role of this station as an important transport interchange and gateway in the South West Sub-region and will aim to achieve an increase in public transport mode share in the sub-region.

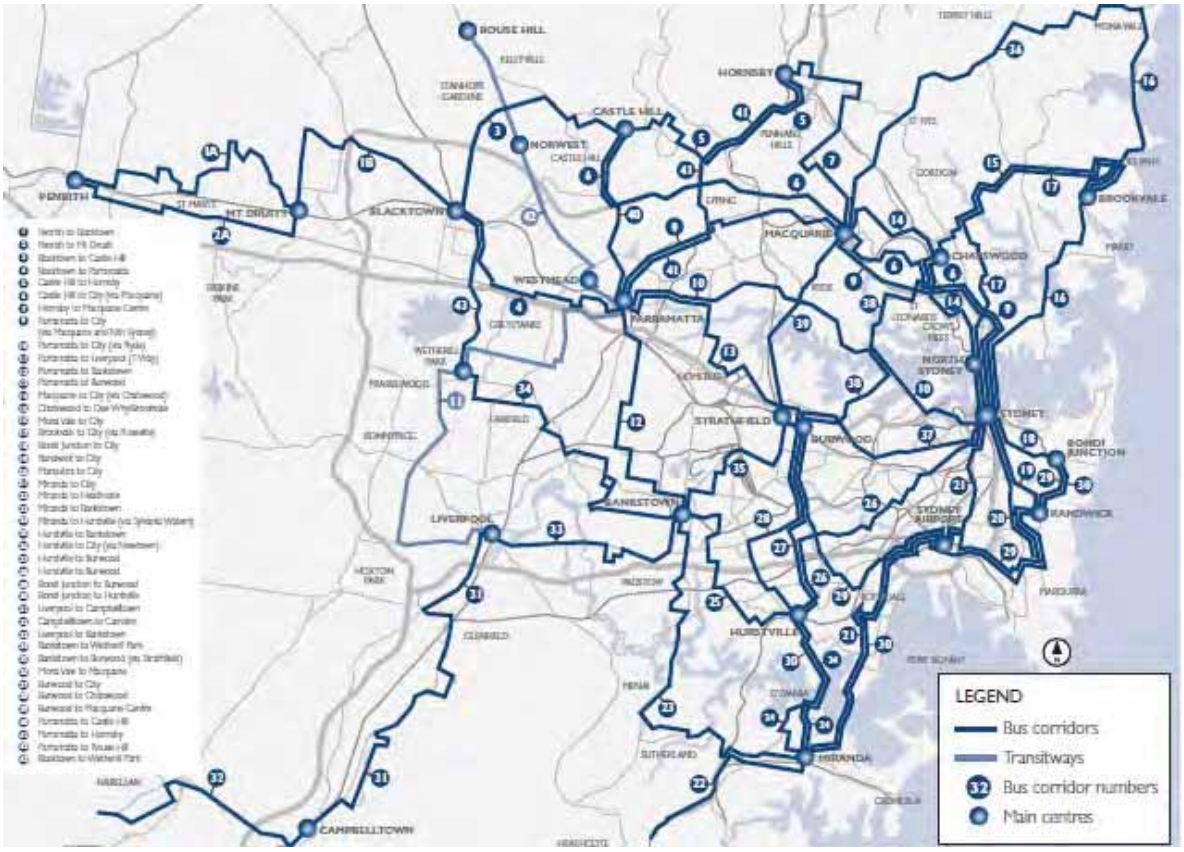
Another key direction of the Strategy is to implement Strategic Bus Corridors that provide fast, frequent, direct and convienient bus services between Sydney's Strategic Centres. The Strategy states that the Strategic Bus Corridor services will target a 25km/hr average bus speed on each corridor and be supported by new integrated bus networks linking into the Strategic Corridors. The Strategy identifies four Strategic Bus Corridors in the South West namely; Liverpool to Parramatta Transitway (Corridor 11), Liverpool to Campbelltown (Corridor 31), Liverpool to Bankstown (Corridor 32) and Campelltown to Camden (Corridor 32) as shown in **Figure 6.** Corridor 31 that travels between Liverpool and Campbelltown travels along Glenfield Road and Canterbury Road in the vicinity of the site. These strategic bus corridors will also aim to achieve an increase in public transport mode share in the South West.

Improvements to the existing transport system have been identified including; improving reliability and increasing capacity of rail services, improving the integration of public transport and improving the operational management of existing transport networks.

The Draft South West Sub-regional Strategy also highlights that due to the low proportion of trips made by walking or cycling in the South West (12 per cent), improvement to local and regional walking and cycling networks is required by providing better facilities and a better alignment of the local walking and cycling networks with public transport routes.

This strategy sets the direction for future development at this site, supported by significant public transport network investment, aiming to improve accessibility to this site and reduce car reliance in the area.

Figure 6: Strategic bus corridors



Source: RMS, 2012

3.1.2 South West Sector Bus Servicing Plan

The South West Sector Bus Servicing Plan identifies a short term and long term bus route that will travel in the vincinity of the site. The short term proposed bus service (route 858) will travel between Glenfield Station and Ingleburn via Canterbury Road and Glenfield Road. The long term bus route (P2) will also travel along Canterbury Road and Glenfield Road between Glenfield Station and Leppington every 15 minutes in the peak periods. These bus routes will provide a additional connections between the site and Glenfield Station.

3.2 Planned development

3.2.1 Moorebank Intermodal Terminal Facilities

Two intermodal terminal facilities have been proposed on Department of Defence land and privately owned land in Moorebank. The proposed facility to the east of Moorebank Avenue is privately owned by the SIMTA alliance, while the Commonwealth Government is planning to develop a larger intermodal terminal to the west of Moorebank Avenue. The Commonwealth intermodal terminal facility site is proposed to be located on a 220 hectare parcel of land currently occupied by the School of Military Engineering (SME) and other Department of Defence uses, to the west of Moorebank Avenue.

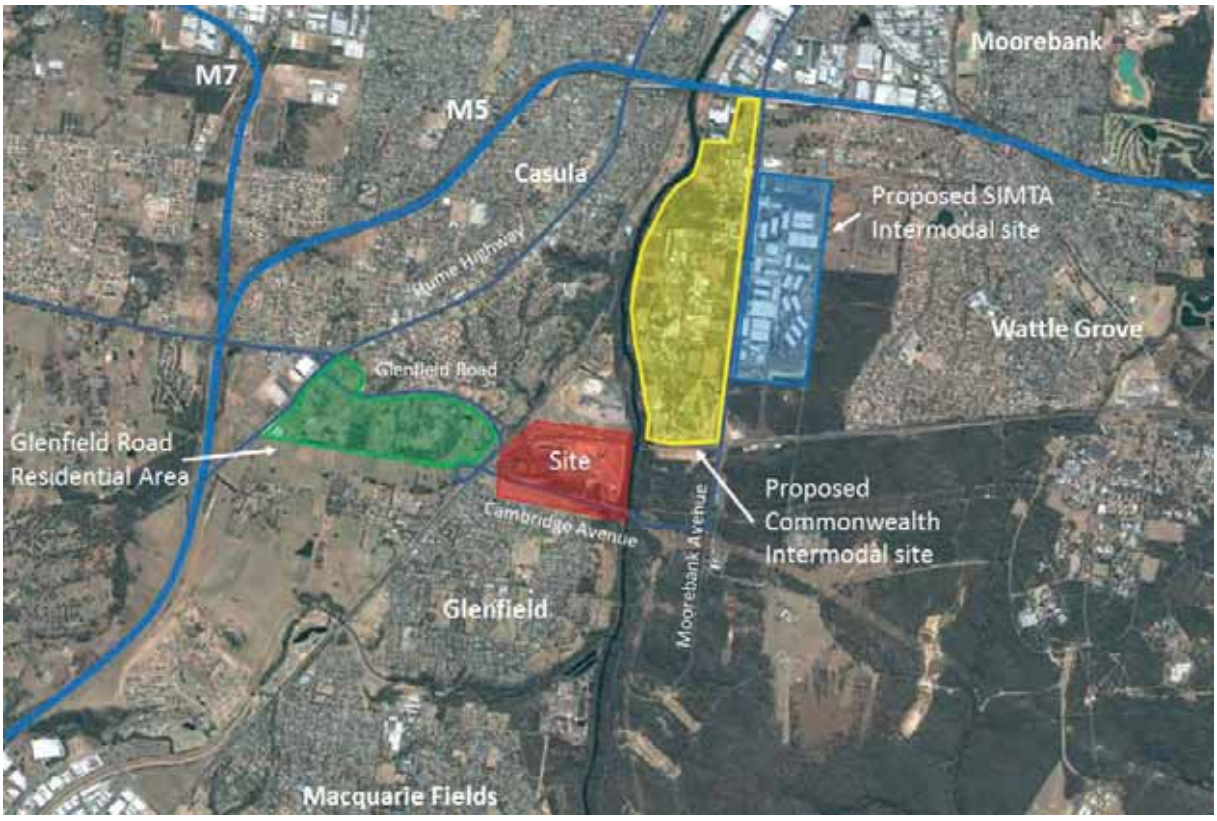
The location of the Moorebank Intermodal Terminal Facilities is shown in **Figure 7**.

The SIMTA intermodal proposal would have a capacity of 1 million containers per year (twenty foot equivalent), while the Commonwealth proposal would be expected to have a capacity of 1.5 million per year.

The Moorebank area is well positioned for intermodal terminal facility development due to its positioning near the proposed Southern Sydney Freight Line, as well as the regional road network including the M5 and M7 Motorways. High industry growth rates in Western Sydney will see greater demand for these facilities, and will serve to take truck movements off Sydney's roads.

It is anticpated that the Moorebank Intermodal Terminal will have the effect of reducing the number of truck movements between Port Botany and Moorebank along the M5 corridor in the order of 2,700 movements per day.

Figure 7: Planned development in the vicinity of the site



Source: AECOM, 2012

A new rail link is proposed to connect the new terminal facility site with the Southern Sydney Freight Line, taking a significant number of trucks currently travelling to Port Botany off inner Sydney roads. The SIMTA facility would accommodate 300,000 square metres of offices and warehousing space, as well as 8,000 square metres of driver facilities. Approximately 2,260 employees would work on site at full development (Hyder, 2011).

The Environmental Impact Assessment prepared for the SIMTA intermodal proposal highlights that there will be a number of potential traffic and transport impacts, including truck traffic generation and employee trip generation. The site could generate up to approximately 2,600 daily truck movements at full development, with approximately 3,600 daily car movements to the site during a 24 hour average weekday. The Traffic Assessment for the SIMTA intermodal proposal details that the traffic distribution will result in 98% of traffic travelling north along Moorebank Avenue to the M5, while two percent would travel south, past the Glenfield Waste Services site.

Using the daily truck and car movement figures provided in the Traffic Assessment, it can be estimated that there could be 124 movements per day past the site as a result of the development of the SIMTA Intermodal Terminal Facility. Taking into consideration current traffic levels along Cambridge Avenue, these additional movements would not be expected to have significant adverse impacts to the road near Glenfield Waste Services, preserving the majority of the existing reserved capacity on the surrounding road network between the site and Campbelltown Road.

On the other hand, the cumulative impacts of SIMTA and the Commonwealth intermodal terminal facility on the surrounding area may represent a significant traffic impact. The impacts of the Commonwealth Intermodal Terminal Facility are currently being quantified with an Environmental Impact Statement (EIS), including the investigation of traffic, transport and access issues. Once the EIS is completed, more details will be available in relation to traffic impacts on the surrounding road network. Note that given the constraint of the Georges River causeway, it is expected the majority of the traffic generated by the Commonwealth intermodal terminal facility will be directed toward the M5 Motorway.

3.2.2 Glenfield Road residential development area

The Glenfield Road residential development area lies south of Glenfield Road between the railway corridor and Campbelltown Road, as shown in **Figure 7**.

It provides for low density and town house residential development, and is one of the largest urban release areas in the Campbelltown Local Government Area. As part of the precinct's Development Control Plan (DCP), the development must increase opportunities for choice in mode of transport by ensuring all lots are within 400 metres of a serviced bus stop. The development must also encourage walking and cycling by providing safe, convenient and legible movement networks within and beyond the development, resulting in a developed network of pathways west of the site towards Campbelltown Road.

3.3 Planned infrastructure

3.3.1 Campbelltown Road upgrade

Roads and Maritime Services (RMS) are currently planning to upgrade Campbelltown Road between Camden Valley Way (at the Cross Roads) and Denham Court Road. The upgrade is 5.1km in length, and is aimed at improving road safety and operational efficiency as well as meeting the future land use and traffic demands of the South West Growth Centre (SWGC).

Campbelltown Road is a 13.5km corridor running north-south between Camden Valley Way to the north and Moore Street to the south. The road functions as an arterial road linking major urban and rural areas and is an integral component of the transport network in the south-west region of Sydney. The corridor is the main road through the suburbs of Edmondson Park, Denham Court, St Andrews, Raby and Woodbine.

The concept design for the proposal would include the following key features:

- General widening to four lanes (two lanes in each direction) with a wide central median.
- The wide central median will allow for future widening to six lanes, when required in the future.
- Three new signalised intersections for improved access with the Edmondson Park precinct and town centre including a new railway station and bus interchange.
- The existing roundabout at Denham Court Road would be replaced with a signalised intersection.
- Duplication of a bridge over F5 Freeway/Hume Highway for widening Campbelltown Road.
- Improved safety by providing a divided carriageway, shared path and pedestrian crossings at signalised intersections.
- Improved public transport by providing improved access to the Edmondson Park station on the South West Rail Link.
- Urban design, including landscaping, an off-road shared pedestrian and bicycle path, integrated with the planning of the Edmondson Park development.

This road upgrade will provide additional capacity to the Campbelltown Road corridor (particularly at the intersection at Glenfield Road) required to cater for the likely traffic generated by the South West Growth Centre. The proposed shared path facilities and pedestrian crossings at signalised intersections proposed as part of this upgrade will improve pedestrian and cycle accessibility to the wider network.

3.3.2 South West Rail Link (SWRL)

In 2009, the NSW Government announced the construction of a new 11 kilometre rail line – South West Rail Link (SWRL) from Glenfield to Leppington in South West Sydney. The project includes upgrades to Glenfield Rail Station and the line itself as it passes through the Glenfield Waste site.

The SWRL will enhance opportunities for public transport travel to and from Glenfield, as such the planning of the site should maximise the opportunity presented by this new infrastructure to minimise the need for car travel.

Upon completion, the total number of services through Glenfield Station during the weekday peak hour will increase from eight to a maximum of 12. By the year 2020 the number of services is forecast to rise to 20 during the weekday peak hour. This improved rail accessibility will enhance public transport opportunities for the site and likely result in an increase in mode share for rail users.

3.3.3 Glenfield Transport Interchange upgrade

The Glenfield Transport Interchange comprises an upgrade to Glenfield Station to accommodate the introduction of the planned South West Rail Link, as well as the construction of a multi-storey commuter car park. The project is currently under construction, with completion due in 2013. The improvements to Glenfield Station aim to enhance interchange facilities including a new station building and enhanced bicycle facilities (Global Arc, 2009).

The upgrade includes changes to Railway Parade to offer enhanced interchange opportunities. This will be achieved through:

- Enhanced bus facilities, including priority bus measures.
- Increased provision for kiss and ride.
- Improved pedestrian crossing opportunities.
- Widening of the Railway Parade cycle lanes to 1.5 metres.

The provision of additional commuter parking will result in an overall increase from 720 to 1,254 spaces located in Roy Watts Road, Railway Parade and Seddon Park.

The Glenfield Transport Interchange upgrade aims to increase the attractiveness of public transport services to meet expectations of regular users, as well as increase its mode share of travel to and from the area. Any increase of public transport mode share to the site would reduce private vehicle trips, and reduce any subsequent traffic impact on the local road network.

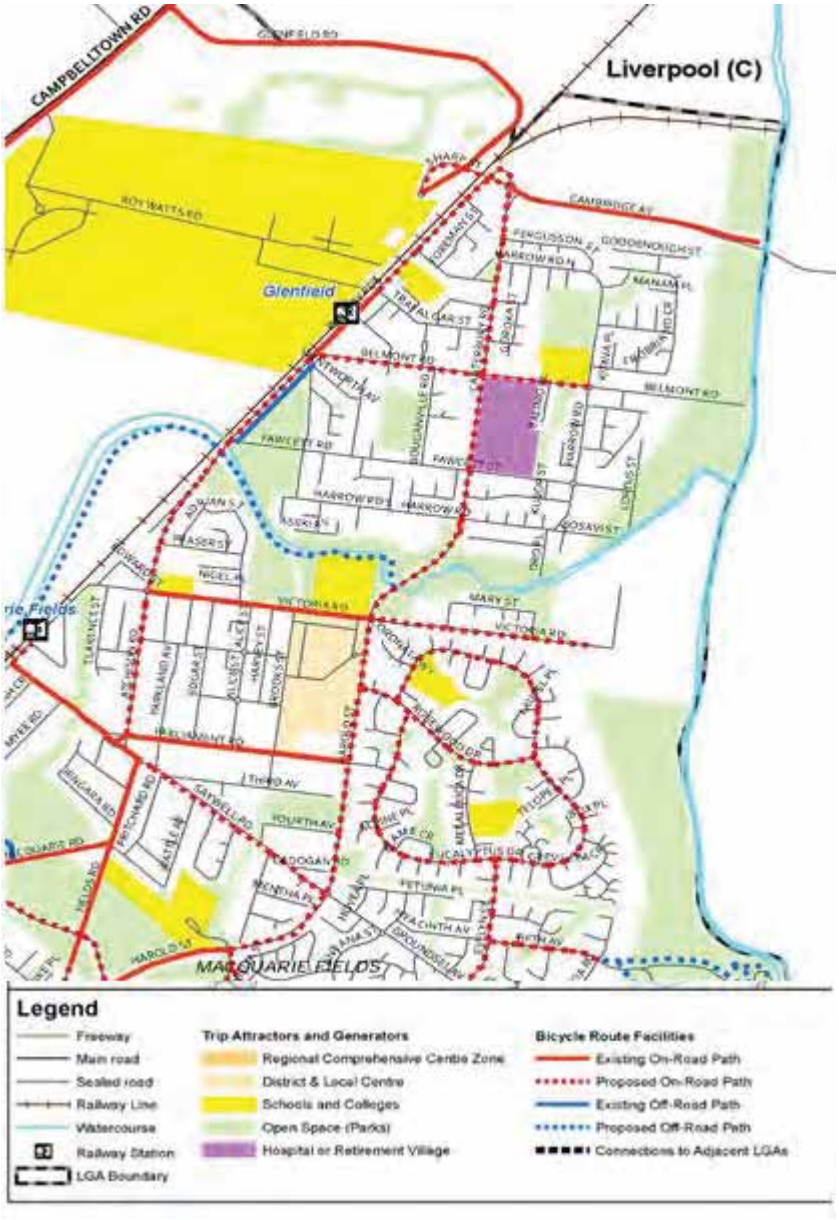
The Draft South West Sub-regional Strategy identifies that the planned South West Rail Link (SWRL) will connect the South West Growth Centre (SWGC) to the existing rail network at Glenfield .This connection to Glenfield will reinforce the role of this station as an important transport interchange in the South West Sub-region facilitating transfers between services on the East Hills Line, the Main South Line and the Cumberland line and will help to achieve an increase in public transport mode share in the South West.

3.3.4 Planned walking and cycling infrastructure

Campbelltown City Council has a footpath improvement program in place to identify areas of path which need to be replaced, as well as determine where new footpaths could be provided to achieve maximum use. Council uses a weighting system to assess which areas of footpath to upgrade, as well as where new footpaths should be situated.

Campbelltown City Council's Bike Plan provides details of where cycle facility upgrades are planned to be located in the vicinity of the study area, as shown in **Figure 8**. The on-road bicycle lane along Railway Parade is planned to be extended further north to the site, as well as south to Macquarie Fields. An on-road route is also planned to extend down Canterbury Road, from the intersection with Cambridge Avenue in the north, connecting to the wider network in Macquarie Fields and Ingleburn. These new cycle routes will provide enhanced connectivity to the site for cycle commuters, and provide greater incentive for workers to shift from private car to bicycle travel.

Figure 8: Cycleway network, current and planned facilities



Source: Campbelltown City Council, 2012

The NSW Bike Plan also identifies a regional proposed cycle route between Liverpool and Campbelltown as shown in **Figure 9**. The proposal along the Hume Highway and the M5 Motorway will improve general attractiveness and accessibility to cycle to the proposed site.

Figure 9: NSW Bike Plan

Source: TfNSW, 2010

4.0 Proposed site use

The current proposal is to rezone the 60ha site within the Campbelltown City Council LGA from its current 1(a) Rural A Zone to a 'IN1 General Industrial' Zone, which permits the site to be used for industrial purposes.

The existing operations at Glenfield Waste Services are to be retained at the existing level. Services and facilities within the site will be shifted to Glenfield Waste Services land immediately to the north (within the Liverpool City Council LGA) of the site where operations will be consolidated.

The proposed land use would also help to achieve the State Government's employment targets as outlined in the Draft South West Sub-regional Strategy and as discussed in **Section 3.1.1.**

4.1 Proposed development yield

Of the 60ha site considered, certain areas are considered not appropriate for future development including:

- Approximately 12ha of land south of Cambridge Avenue (due to the transmission easement).
- Approximately 3ha of land adjoining the Georges River.
- Approximately 15 hectares of land fill that includes the area between the East Hills Railway Line and Council's LGA boundary.
- Approximately 2 hectares for setbacks, buffers, open space and infrastructure including required setbacks to existing rail lines.

Therefore, the total amount of developable area on this site is approximately 28 ha. The land considered for rezoning is shown in **Figure 10**. The proposed land uses include large scale industrial warehouses, which are intended to capitalise on the excellent accessibility of the site to the regional transport network and its proximity to the proposed Moorebank Intermodal Terminal Facilities.

Figure 10 Indicative site layout (yet to be confirmed)

Source: EPS, 2012

The anticipated number of employees forecast to occupy the site depends upon the refined developable area, the final Floor Space Ratio approved in the master plan and the specific type of businesses operating on site. Since these are not yet known, the following lower and upper estimates of potential employment numbers have been made:

- Lower estimate: 780 employees. This is based upon 28 employees per developable hectare (RTA Guide to Traffic Generating Development 2002).
- Upper estimate: 1,250 employees. This is based upon an estimate of GFA and FSR on the site whereby:
    - The estimated GFA is approximately 200,000sqm with estimated FSR of 1:1 (other than 15ha which is 0.3:1).
    - The estimate of employee density at the site is 1 employee per 160sqm GFA (based on the typical warehouse employment densities expected at the site).

4.2 Proposed site access

The number and nature of vehicles entering the site in the future will result in additional access requirements, particularly as the number of heavy vehicles accessing the Glenfield Waste Site will be maintained at existing levels. In addition, it is unlikely that the secondary access from Railway Parade will be able to accommodate any significant increase in additional movements.

Therefore, it is proposed that an additional access to be provided at Cambridge Avenue (to the west of the existing access), as shown in **Figure 7**. This new access will be the primary access to the new industrial and warehouse site, which segregates from the existing heavy vehicle access to the Glenfield Waste Site. A new access point at Cambridge Avenue should be feasible given its straight horizontal alignment. The exact location and form of the access will be subject to further assessment and detailed design once the final land uses and development areas are confirmed at the development application stage.

4.3 Proposed car parking

Car parking spaces for future employees and visitors of the new industrial and warehouse development will be provided on-site based on the car parking requirements of the relevant Development Control Plan (DCP).

To provide an indicative assessment, it is currently estimated that on site car parking requirements will be in the order of 1, 300 total spaces. This is based upon an assumed floor area of 200,000 square metres with a ratio of 10% office use and 90% warehouse use.

5.0 Potential Impacts

This section provides a summary of potential impacts that may stem from the rezoning of the site for industrial type employment uses. At this preliminary stage, the assessment is strategic in nature and the findings of this section will require further analysis at a the development application stage to determine detailed traffic impacts of the site.

5.1 Potential trip generation

The RTA (RMS) Guide to Traffic Generating Developments (2002) notes that the amount of trips generated by industrial land use is highly variable depending upon the specific number and type of business operating on site. As the specific type of business is not known, general industrial land use trip generation guidelines have been followed as outlined within the document.

For the purpose of this review, the likely employment numbers of the site has been assumed to be ranging between 780 and 1,250.

Trip generation estimates have been determined based upon the number of employees as outlined above and Table 3.4 in the RTA Guide for Traffic Generating Developments (2002). Based on the trip generation distribution of industrial estates for a situation of 1000 employees in a wide range of factory types, the indicative trip generation rates are as follows:

- 0.318 total trips per employee during the AM peak hour of (8-9am).
- 0.365 total trips per employee during the PM peak hour of (5-6pm).
- 2.3 total trips per employee during a typical day (7am to 7pm).

The indicative trip rates suggested that approximately 14 per cent of the expected daily trips will be generated during the AM peak hour and approximately 16 per cent of the expected daily trips will be generated during the PM peak hour, with the rest of the trips spread out throughout the rest of the day.

The total likely trip generation for the overall (proposed industrial and existing use) use of the site is summarised below (**Table 4**):

Table 4: Likely Trip Generation

Time Period	Estimated Employment Number	Indicative Industrial Trip Rates	Additional Industrial Trips (Range)	Retained Waste Site Trips	Likely Total Trips (Range)
AM Peak (hr)	780 – 1,250	0.318	250 - 400	7*	260 - 410
PM Peak (hr)		0.365	280 - 460	15*	300 - 470
Standard Weekday (7am-7pm)		2.3	1,800 - 2,880	126*	1,920 – 2,880

*- Includes recorded visitor trips to the Glenfield Waste Site as well as staff trips.

Source: RTA (RMS) Guide to Traffic Generating Developments 2002

Based on the potential employment level of the site, it is estimated that the site could generate up to an additional 470 trips in the PM peak hour and 2,880 trips in a typical weekday.

5.2 Potential impacts and mitigation

5.2.1 Car

Given the estimated future trip generation represents an increase on the existing situation, there is likely to be some impact upon the local traffic network. Further work will be required to assess intersections at key locations likely to be impacted by the additional traffic generated under proposed future conditions. This includes traffic generated by both the site and neighbouring developments such as the Moorebank Intermodal Terminal Facilities.

However, intersection analysis undertaken in 2008 on the Cambridge Avenue / Canterbury Road / Glenfield Road intersection indicates that the intersection performs acceptably and with spare capacity in both peak hours. Further assessments are needed to ensure the road network and other transport infrastructure is able to accommodate future traffic demands.

Based on the potential employment level of the site, it is estimated that the site could generate up to an additional 470 trips in the PM peak hour and 2,880 trips in a typical weekday. It should be noted that the trip generation could be varied based on the refined developable area, the final Floor Space Ratio approved in the master plan and the specific type of businesses operating on site.

Of these likely additional trips to the future site, some of the key routes leading to the site would include:

- M5 / M7 Motorway – Camden Valley Way / Hume Highway – Campbelltown Road – Glenfield Road – Cambridge Avenue.
- Pembroke Road – Minto Road – Collins Promenade – Harold Street – Canterbury Road – Cambridge Avenue.
- Moorebank Avenue – Cambridge Avenue.

Considering the level of existing vehicle flows and the likely trip generation, further study will be required into the ability of Cambridge Avenue to accommodate future traffic demands expected to be generated by both the site and neighbouring developments such as the two proposed Moorebank Intermodal Terminal Facilities. Other potential constraints that should be further investigated include:

- Campbelltown Road / Glenfield Road signalised intersection.
- Glenfield Road roundabouts and railway bridge.
- Glenfield Road / Canterbury Road / Cambridge Avenue roundabout.
- Cambridge Avenue causeway over Georges River.

However, the trip generation for private vehicles is based on proposed floor area and number of employees. It does not take into full account the proximity of the site to Glenfield Station and frequent train and bus services that would service the station, which would potentially reduce the number of trips by private vehicle, as outlined in the Draft South West Sub-regional Strategy and South West Sector Bus Servicing Plan. These public transport infrastructure upgrades combined with improvements to the walking and cycling network in the study area would also help to reduce the amount of private vehicle trips, thus reducing the impact to the local road network.

Travel Demand Management (TDM) measures could also be implemented at the site including preparation of a Work Place Travel Plan for employees at the site. A Work Place Travel Plan includes iniatives and measures aimed at reducing the need to travel by private vehicle and encouraging travel by public and active transport, which in turn would also reduce the impact to the local road network.

5.2.2 Walking

Assuming (on the basis of current journey to work mode split proportions) that between two and five per cent of the employment population of the site would walk to work, this would be between 20 and 60 pedestrians. There will also be an additional five to eight per cent train commuters that could also walk between Glenfield Station and the proposed site. This could add up to another 100 pedestrians on the surrounding network.

Footpaths should be provided along Cambridge Avenue to provide connectivity between the site and the surrounding residential areas within the walking catchment of the site. A safe and efficient pedestrian connection to Glenfield Station should be encouraged to maximise the walking population to the site.

A pedestrian connection should be considered between Goodenough Street and Cambridge Avenue (connecting to the existing underpass beneath Cambridge Avenue that could link to the site) to reduce walking distances to Macquarie Fields and to provide an alternative route to Glenfield Station. The opportunity to create a pedestrian connection along Georges River adjacent to the site should also be considered. This may in future assist in the development of a leisure trail to connect adjacent communities.

The layout of the site should include footpaths on all roads, in accordance with relevant guidance including Planning Guidelines for Walking & Cycling Guidelines (Department of Planning, 2004) and Guide to Traffic Engineering Practice Part 13: Pedestrians (Austroads, 1995).

5.2.3 Cycling

As with walking trips, cycle access to the site would likely be in the order of two to five percent. This would equate to between 20 and 60 trips. All cycle facilities should be provided in accordance with the NSW Bicycle Guidelines (RTA, 2003).

Within the site, consideration should be given to cyclists. Due to the likely high proportion of heavy goods vehicles, off-street shared paths may be appropriate. Cycle connections would be required to connect local communities. This would likely include a cycleway on Cambridge Avenue, the form of which (on-street or off-street) would need to confirmed when likely vehicle numbers on Cambridge Avenue are known.

Further from the site, the opportunity exists to link the site to other regional cycleway including the M7 Cycleway. This will improve the attractiveness of future workers to cycle to and from work in a safe environment.

5.2.4 Bus

At current mode splits, bus use to the site would be minimal with some 10 to 20 passengers in the morning peak hour (or 6 passengers per bus at a 30 minute frequency).

A number of opportunities exist to improve bus mode share from current levels such as:

- Improving bus services (frequencies to existing bus routes) to Glenfield Station to match the potential increase train patronage due to the completion of Glenfield Transport Interchange and the South West Rail Link (consistent with the South West Bus Servicing Plan).
- Extending / diverting existing bus services to operate along Cambridge Avenue and Moorebank Avenue to service significant increase in employment population of the site and the Moorebank Intermodal Terminal Facilities, linking these new employment areas with Campbelltown, Liverpool and Glenfield.

These opportunities should be further discussed with Transport for NSW and local bus operators. They would encourage people working within the site to take public transport as an alternative to the private car, serving to alleviate trips generated by the site.

The internal road network should also be designed to accommodate bus operation such that a shuttle bus service can be operated between Glenfield Station and the site, prior to the warrant of the extension of a local public bus service.

5.2.5 Rail

Rail is likely to account for around five to eight percent of journeys to the site. These levels are similar to those for walking and cycling modes and could equate to up to 100 people travelling by train during the peak hours, depending on the employment projections.

This level of demand is likely to be accommodated within existing rail services as well as the expected service / capacity improvements due to the completion of South West Rail Link. Connectivity between the site and Glenfield Station will be important to maximise the rail potential of the site.

It should also be noted that the commission of the SWRL can potentially increase the amount of employees that live in the SWGC to travel to work by train. This will further reduce the amount of vehiclur trips generated on the surrounding road network.

6.0 Summary and Recommendations

AECOM has been engaged by L.A Kennett Enterprises to undertake a traffic and transport review of a 60ha site within the Glenfield Waste Services operational land area in support of a rezoning submission report for Campbelltown City Council (Council). This will form part of Council's preparation of a Standard Instrument Local Environmental Plan (SILEP) for the Campbelltown LGA.

Based on a desktop review of available information and site observations, a number of traffic and transport opportunities and constraints in the vicinity of the site are observed:

- Heavy reliance on cars in the North Campbelltown area, especially trips made to this area as a destination.
- Good connectivity and direct access to Sydney's Motorway Network and the surrounding sub-arterial road network.
- Capacity on the local road network with flexibility of upgrading the local road network such as Cambridge Avenue to cater for some future traffic growth.
- Spare capacity at the key intersection of Glenfield Road / Canterbury Road / Cambridge Avenue to cater for future traffic growth in the area.
- Good access to rail and bus services at Glenfield Station.
- Access to regional cycleway infrastructure that provides a sustainable alternative mode of travel.
- Low provision of walking facilities in the area.

The site occupies an area with good public transport access, with the Glenfield Rail Station and bus stops within practical walking distance of the site. It is also likely that public transport services will be enhanced in the future as SWRL is completed and a number of other major developments are being considered in the vicinity of the site, including the two Moorebank Intermodal Facilities that should be developed with a package of infrastructure upgrades and public and active transport measures to minimise the reliant of car trips and to reduce the impacts on the surrounding road network.

Based on assumptions regarding building densities and employment ratios, the site is likely to employ between 780 and 1,250 employees. This is expected to generate between 280 and 460 private vehicle trips during the evening peak hour. However this number is likely to be less in reality as it does not take into full account the site's high level of accessibility to public transport including the SWRL and improvements to bus services as Glenfield Station. The number of private vehicles trips is also likely to be reduced further due to the planned future public and active transport infrastructure and initiatives.

On the basis of the preliminary review, the site would appear to be appropriate for "IN1 General Industrial" from a transport perspective, subject to further detailed traffic impact assessment to determine the capacity of the existing road network and identify the extent of required infrastructure improvements. This includes:

- Obtaining detailed traffic data to ascertain the level of spare capacity on the existing road network.
- Refining detailed land uses and projections for site occupancy (employment, floor area).
- Focusing on improving public transport infrastructure to encourage a shift away from private car use.
- Reviewing bus operations in the vicinity of the site in conjunction with Transport for NSW and bus operators.
- An investigation into the opportunities for linking the site to walking and cycling networks in the area, particularly to Glenfield Rail Station.
- Detailed trip generation and trip distribution by all modes of transport.
- Understanding likely impacts of Moorebank Intermodal Facilities.
- An assessment of the intersections likely to be impacted by future traffic volumes.
- A detailed assessment of site access requirements.
- Consultation with all relevant transport stakeholders.

Aside from the potential impacts to the local road network the site might produce, it should be noted that the site would be contributing to the State Government's employment targets as outlined in the Draft South West Sub-regional Strategy. The fact that the site is located close to public transport and has the opportunity to increase active transport to and from the site strengthens its appropriateness for "IN1 General Industrial" land use.

EPS

Attachment 2.4

GLENFIELD ECOLOGICAL ASSESSMENT

Prepared for JC & FW Kennett Pty Limited & Figela Pty Limited (Glenfield Waste Services)

Prepared by Environmental Property Services

Cambridge Avenue, Glenfield NSW 2167

ENVIRONMENTAL PROPERTY SERVICES
Reference No: 11009/11012
May 2015

Contact Information and Declaration		
Declaration:	The declaration relates to the submission of this Ecological Assessment Report prepared for JC & FW Kennett Pty Limited & Figela Pty Limited (Glenfield Waste Services) in respect to the Glenfield Waste Services southern parcel of land. The opinions and declarations in this Ecological Assessment are ascribed to Environmental Property Services (EPS) and are made in good faith and trust that such statements are neither false nor misleading. In preparing this Ecological Assessment, EPS has considered and relied upon information obtained from the public domain, supplemented by discussions between key EPS staff, representatives from JC & FW Kennett Pty Limited & Figela Pty Limited and other consultants.	
Prepared by:	Toby Lambert Bachelor of Environmental Science Principal Ecologist Environmental Property Services PO Box 348 NELSON BAY NSW 2315 Ph: 02 4981 1600	 …….. Toby Lambert
Application subject land address:	Cambridge Avenue Glenfield , NSW Lot 91 DP1155962; Lot 3 DP735524; Lot 3 DP 736881; Lot 1 DP113201; Lot 2 DP 333578	
Licences:	*National Parks and Wildlife Act 1974* Scientific Licence number: SL100772	

Quality Assurance & Version Control Table				
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V02	07/5/2015	11012 GWS Ecological Assessment	T. Lambert	Steve McCall
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EXECUTIVE SUMMARY

Environmental Property Services (EPS) was engaged by landowners JC & FW Kennett P/L & Figela P/L to prepare an Ecological Assessment Report (EA) for Glenfield Waste Services (GWS). This EA was prepared to provide a detailed assessment of the ecological characteristics of the GWS's southern parcel of land located in the Campbelltown LGA including the presence and/or likelihood of occurrence of threatened flora and fauna and their habitat.

There have been a number of previous ecological assessments of the investigation area and a number of ecological assessments within the Local Government Areas of Campbelltown and Liverpool.

The Ecological Assessment revealed that:

- No threatened flora species or endangered flora populations were recorded on site during surveys;
- Some portions in the Southern Parcel of the GWS site are Cumberland Plain Woodland CEEC (under the TSC Act and EPBC Act) and River-Flat Eucalypt Forest EEC (under the TSC Act). The Cumberland Plain Woodland will be subject to impacts by the SSD and Rezoning components, while the River-Flat Eucalypt Forest will be retained and protected as part of the future management of the site;
- A majority of the threatened species initially considered likely to occur or to have suitable habitat were not identified during any surveys and this is considered to be related to the high level of historical disturbance on a majority of the site;
- The threatened species recorded during the targeted surveys were threatened microchiropteran and megachiropteran bats species, being *Pteropus poliocephalus* (Grey-headed Flying-fox), *Saccolaimus flaviventris (*Yellow-bellied Sheathtail-bat), *Mormopterus norfolkensis* (East-coast Freetail-bat), *Miniopterus australis* (Little Bentwing bat) and *Miniopterus schreibersii oceanensis* (Eastern Bentwing bat)
- No threatened frog, waterbird, arboreal mammal, or fish species were identified during surveys and are considered unlikely to occur on the investigation area;
- The investigation area supported a farm dam which provided an area of open, deep water for common waterbird species;
- The investigation area had been regularly slashed and managed such that there was a paucity of leaf litter and fallen timber across the site and was likely to provide some foraging habitat for only common bird species such as the Common Myna, Magpie Lark, Eastern Rosella, Common Starling etc;
- The investigation area supported a relatively high number of hollow bearing trees; and
- The investigation area was bound by a number of significant barriers to fauna movement.

The woodland vegetation in the southern parcel of land on the GWS site has been assessed in detail by a number of ecological consultancies over a period of eight years. The overall conclusion drawn from these previous studies and the more recent work by EPS has determined that this site provides only limited suitable habitat requirements for threatened flora and fauna species due to historical and ongoing disturbance. The site does support partial habitat requirements for a number of common native and exotic flora and fauna species. The habitat characteristic of most value within the area to be impact by the project is the occurrence of numerous hollow-bearing trees. These are considered likely to provide suitable roosting habitat for the recorded threatened bat species and as such nest boxes are proposed to offset the impacts to these species.

The detailed considerations of vegetation within the subject site by SLR have determined that some of the woodland vegetation in these areas would constitute an example of the CPW community – as listed both at State and Federal level.

In regards to the potential future development opportunities on the site and the potential removal of CPW vegetation within the GWS, these activities would not have a direct significant impact that is likely to:

- Result in an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction; or

- Substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

A biodiversity offset is proposed to provide compensation for the impacts to the Cumberland Plain Woodland.

Further consultation and liaison with the Department of Planning & Environment and the Office of Environment and Heritage is required to determine the best pathway for providing the best possible ecological outcomes whilst still enabling the State Significant Development – Recycling Facility and separate rezoning process to proceed.

An EPBC Referral will be required to be submitted to the Commonwealth Department of Environment to enable impacts to Matters of National Environmental Significance (particularly Cumberland Plain Woodland) to be considered at a Federal level.

Mitigation and compensation measures consist of the following:

1. Site inductions will occur to ensure site worker awareness of ecological sensitivities;
2. Any construction management plans will have an ecological section to highlight the relevant issues;
3. Vegetation disturbance will be limited to the minimum possible footprint;
4. Clearing protocols will be implemented to ensure that clearing of vegetation and in particular the hollow-bearing trees occurs in a sensitive manner;
5. Where possible, storage of construction materials will be limited to disturbed cleared areas on the site;
6. Hygiene and weed management protocols will be implemented during construction on site to avoid pathogen and exotic species spread into retained areas;
7. Disturbance of aquatic habitats will be minimised and erosion and sediment will be managed in accordance with industry standards;
8. Nest boxes will be installed at a compensatory ratio of 2:1 for each tree hollow impacted by the project;
9. The River-Flat Eucalypt Forest EEC will be fully retained and managed in perpetuity into the future for primarily ecological values; and
10. A biodiversity offset strategy will be implemented in relation to the project impacts upon the Cumberland Plain Woodland ecological community.

Combined, the above measures will ensure that ecological impacts of the project will be adequately addressed.

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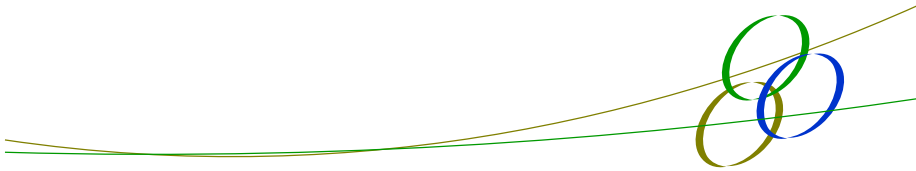

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1 BACKGROUND AND INTRODUCTION

1.1 Background

The Glenfield Waste Site straddles the Campbelltown City Council and Liverpool City Council's Local Government Area Boundary with the northern part of the site situated in the Liverpool Local Government Area (LGA) and the southern part of the site situated within Campbelltown LGA. Combined, the Glenfield Waste Site's northern and southern parcels of land function as the Glenfield Waste Services facility.

The primary land use on the Glenfield Waste Site's northern parcel of land are sandstone and sand extraction and non–putrescible solid waste landfill. To create the landfill cells, soil, sandstone and sand are extracted. The primary land use activity conducted on the Glenfield Waste Site southern parcel of land is recycling of waste.

Environmental Property Services (EPS) has been engaged by landowners JC & FW Kennett P/L & Figela P/L to prepare an Ecological Assessment Report (EA) for Glenfield Waste Services (GWS). This EA was prepared to provide a detailed assessment of the ecological characteristics of the GWS's southern parcel of land located in the Campbelltown LGA including the presence and/or likelihood of occurrence of threatened flora and fauna and their habitat.

The Campbelltown (Urban Area) Local Environmental Plan 2002 zoning map shows the majority of the Glenfield Waste Site's southern parcel of land is Zone 1(a) – Rural A Zone, a strip of land on the boundary of the Georges River is Zone 6(b) Regional Open Space Zone and part of the site adjoining Cambridge Avenue is Zone 5(b) Special Uses Arterial Roads Zone.

Detailed assessment of the likelihood of impacts of the proposal upon threatened species, populations and threatened ecological communities listed at a Commonwealth and State level is required. This EA outlines the results of this required assessment.

1.2 Licensing

Fieldwork was conducted in accordance with *National Parks and Wildlife Act 1974* (NP&W Act) Section 132 (c) Scientific Licence number SL100772. The licence permits the undertaking of biodiversity assessments, species impacts statements, ecological surveys and abiotic sampling as part of flora and fauna surveys.

1.3 Introduction, Local Context and Site Description

The GWS site is approximately 30km south west of the Sydney Central Business District. The Campbelltown LGA is situated within the Sydney Basin Bioregion which lies on the central east coast of NSW and covers an area of approximately 3,624,008 hectares. The bioregion occupies about 4.53% of NSW and is one of 17 bioregions contained within the state. The bioregion extends from just north of Batemans Bay to Nelson Bay, and almost as far west as Mudgee (OEH 2011).

Local Context

The local context has been examined at a radius of both 2km and 5km from the subject site (Figure 1-1). These areas form the boundary of the study area and are representative of the local occurrence of the Cumberland Plain Woodland and in particular the Shale Plains Woodland Critically Endangered Ecological Community (CEEC).

Within the 2km radius of the site the following vegetation areas occur:

- Shale Plains Woodland (CEEC) as mapped by OEH covers approximately 55ha; and
- Cumberland Plain Woodland Priority Recovery Areas cover approximately 256ha.

Within the 5km radius of the site the following vegetation areas occur:

- Shale Plains Woodland (CEEC) as mapped by OEH covers approximately 257ha; and
- Cumberland Plain Woodland Priority Recovery Areas cover approximately 1860ha.

The site is located adjacent to the North West corner of the Holsworthy Military Area. The Holsworthy Military Area is part of a contiguous vegetated area covering 18,000ha south of Sydney. The Georges River separates the Holsworthy Military Area from the GWS site, but likely still allows for the movement of some fauna species and the exchange of genetic material.

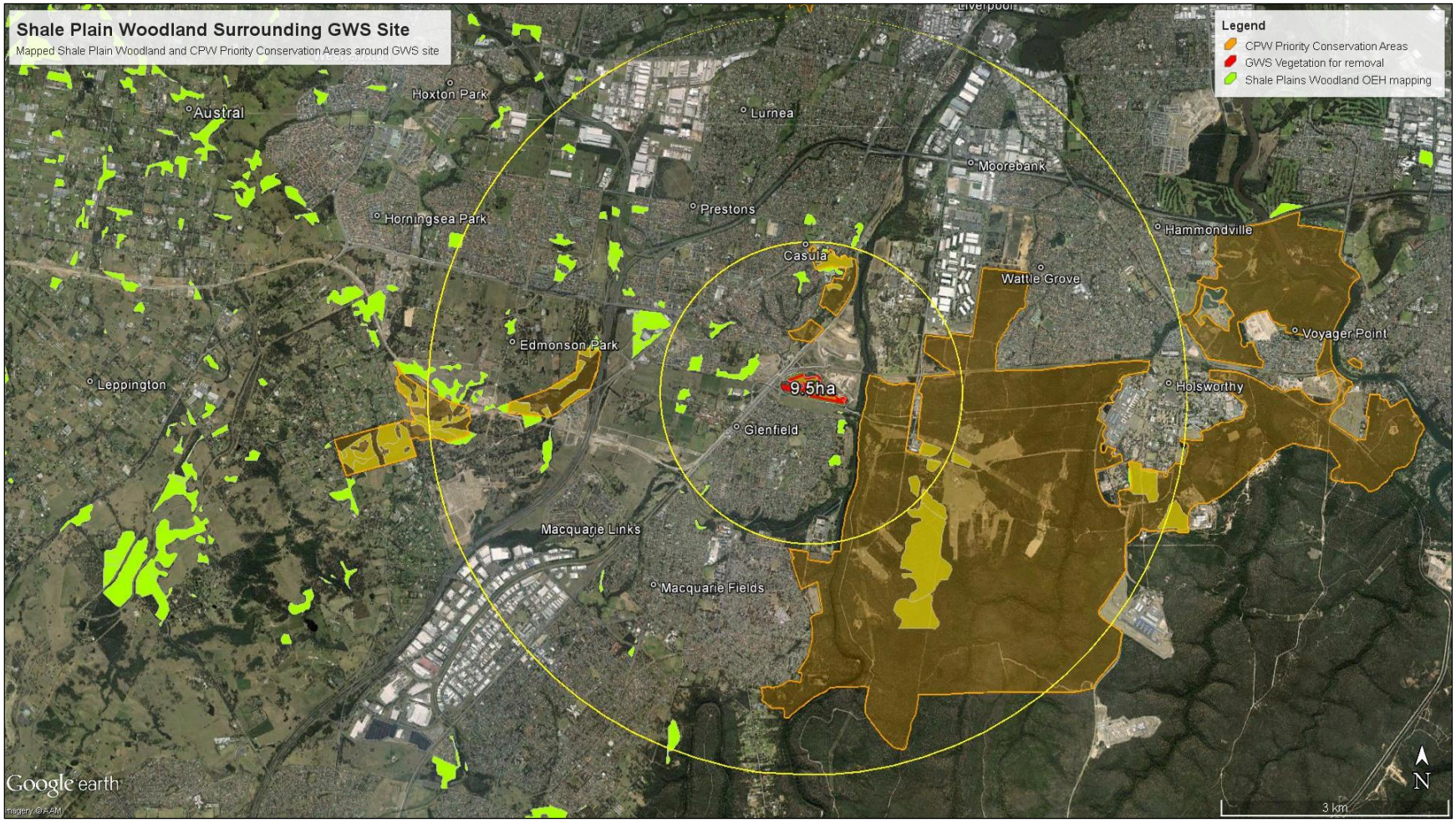

Figure 1-1: Study Area Covering 2km and 5km Radius
(Source: Google Earth Pro under Licence)

Site Description

The GWS southern parcel of land located within Campbelltown LGA, occupies an area of approximately 60 hectares (ha) bounded by the East Hills Railway Line, landfilling, sand and sandstone quarry to the north; the suburb of Glenfield to the south, Georges River to the east and the Southern Rail Line and Canterbury Road to the west.

The features of the southern parcel of land include significant electricity transmission lines and infrastructure impacting the whole of the land located south of Cambridge Avenue, forested riparian vegetation occurring along the river; the East Hills railway line, landfilled areas and non-landfilled areas and a stand of remnant woodland that is regularly underscrubbed for approved fire protection reasons.

A summary of the southern parcel of land details are shown in Table 1-1, while the aerial photograph in Figure 1-2 shows the southern parcel of land, the Glenfield Waste Site and the locality.

Table 1-1: Summary of the Southern Parcel of Land Details

Summary of southern parcel of land details	
Lot and Deposited Plans	Lot 91 DP1155962; Lot3 DP735524; Lot3 DP736881; Lot1 DP113201; Lot2 DP333578
Address	Cambridge Avenue, Glenfield NSW 2167
Topographic Map	1:25000 Campbelltown 9029-1N
Grid Reference	Zone 56, 306519E 6239570N
Local Government Area	Campbelltown
Catchment Management	Sydney Metropolitan
Primary existing Land Use	Landfill recycling of waste & rail and electricity infrastructure
Current Zoning	Zone1(a) Rural A Zone, Zone 6(b) Regional Open Space Zone & Zone 5(b) Special Uses Arterial Roads Zone

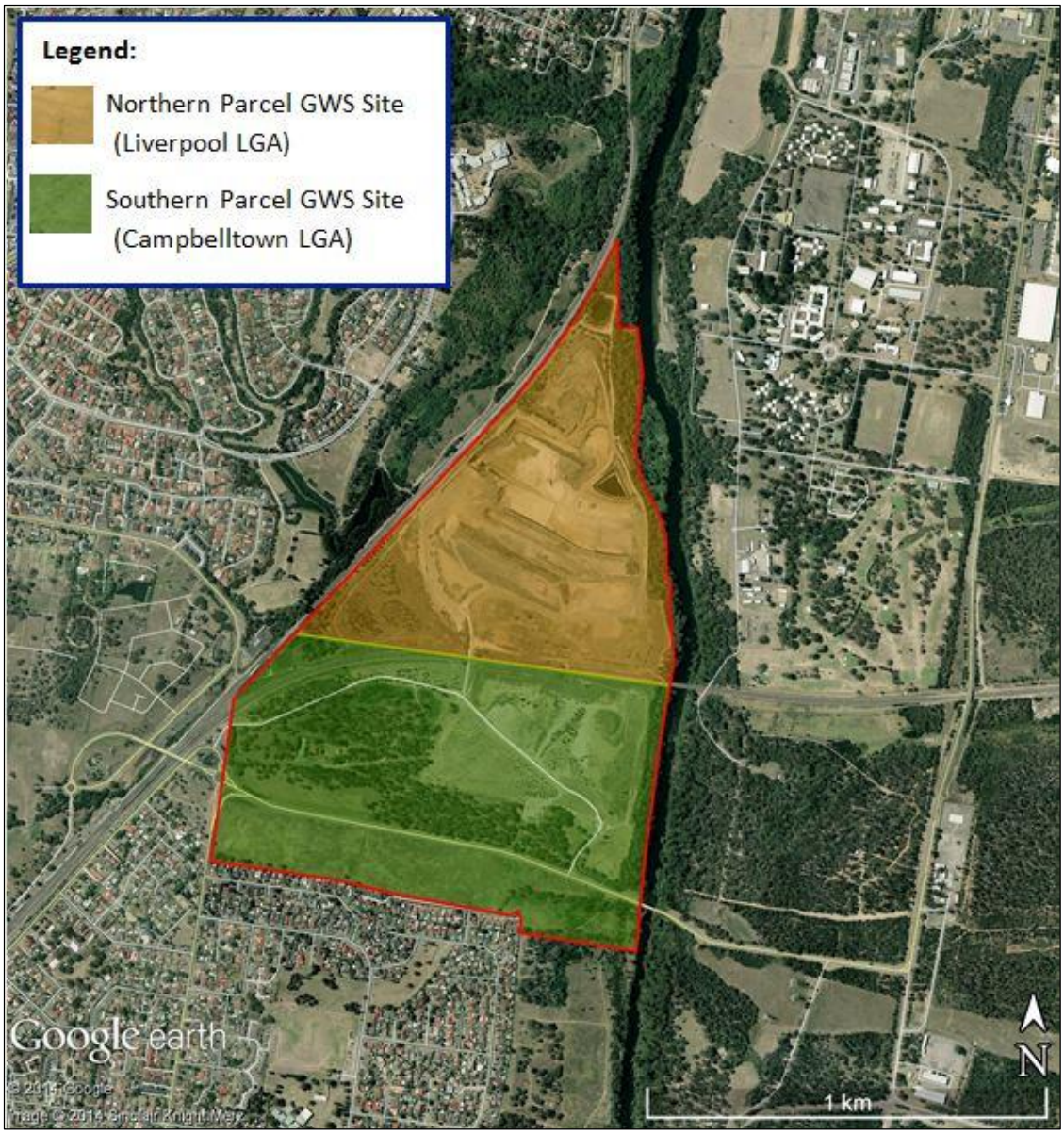

Figure 1-2: GWS site, showing northern and southern parcel of land and LGA boundaries.

The majority of the GWS site has been cleared of native vegetation. Native vegetation is primarily restricted to the Georges River riparian land and woodland on the southern parcel of land. An inspection of the historical aerial photographs (1951, 1961, 1970, 1978, 1986 and 1994) found that the woodland has been present since at least 1951. The understorey appears to have been disturbed by grazing and slashing throughout this period, with understorey clearing evident in 1978 (ACA 2006). Campbelltown City Council has directed the site owners through formal written advice on multiple occasions to maintain the understorey of the vegetation as an Asset Protection Zone to minimise bushfire risk.

1.4 Proposed Development

The proposed development of the GWS site consists of two concurrent projects consisting of firstly, the development of a portion of the site for the operation of a materials recycling facility and secondly, a Planning Proposal to Campbelltown Council to rezone the southern portion of the GWS site to facilitate industrial style employment-generating development. These two proposals are detailed as follows.

It should be noted that this EA assesses the likely impact of both the SSD and the rezoning aspects.

1.4.1 State Significant Development (SSD)

GWS is proposing to develop a materials recycling facility. The project is 'State Significant Development' (SSD) in accordance with Division 4.1 of Part 4 of the EP&A Act, as it is a type listed in Schedule 1 of the *State Environmental Planning Policy* (SEPP) - *State and Regional Development*. As such the proponent is seeking approval for the project under Section 89E of the EP&A Act.

The facility will have a capacity to process 450,000 tonnes per annum of non-putrescible waste, primarily commercial and industrial and construction and demolition waste for reuse in secondary markets. Figure 1-3 outlines the proposed SSD footprint.

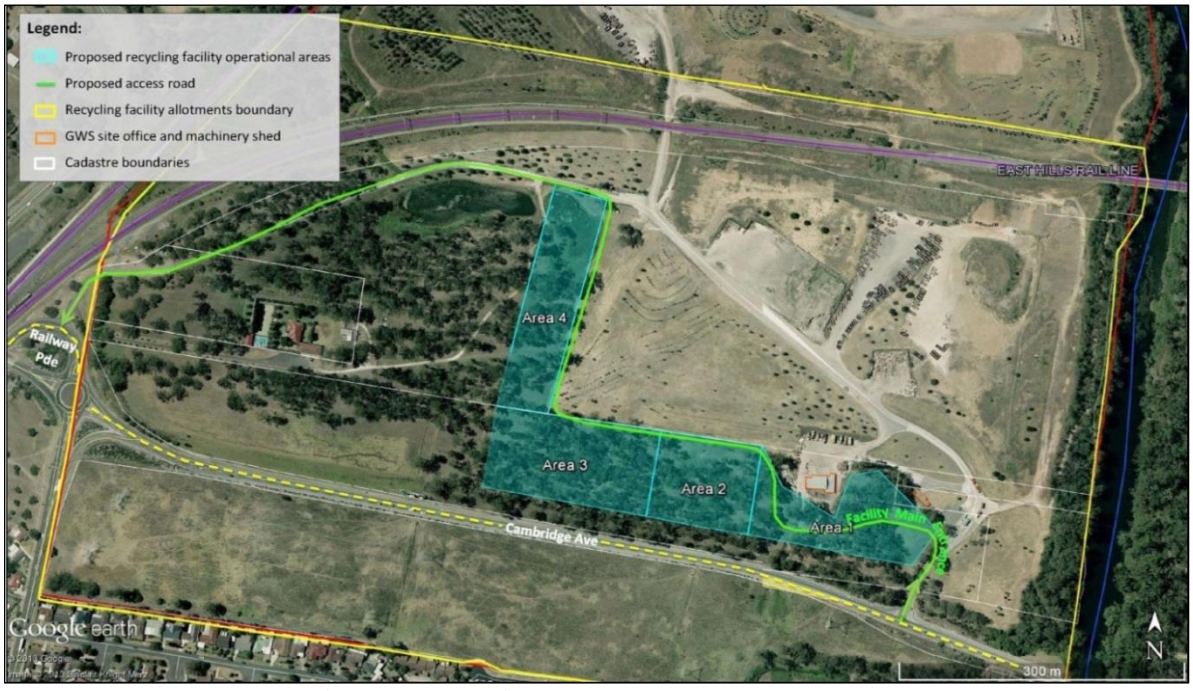

Figure 1-3: Recycling Facility area (approximately 5ha).

1.4.2 Rezoning

The majority of the southern parcel of Glenfield Waste Services land located in the Campbelltown City Council's Local Government Area is Zoned 1(a) – Rural, which reflects the historical rural land uses. The local area is now an established urban area comprising residential, industrial, commercial, education, open space and major public infrastructure land uses. A planning proposal has been produced in order to consider what the site's future function and role should be for the local and regional area. Figure 1-4 below shows the site area outlined in yellow that is intended for rezoning within the boundary of the GWS site.

The rezoning of the southern parcel of land for employment lands is consistent with the regional, subregional and local strategies which strategically guide the management of future population growth in the Sydney Metropolitan area, the South Western Region of Sydney and the Campbelltown LGA.

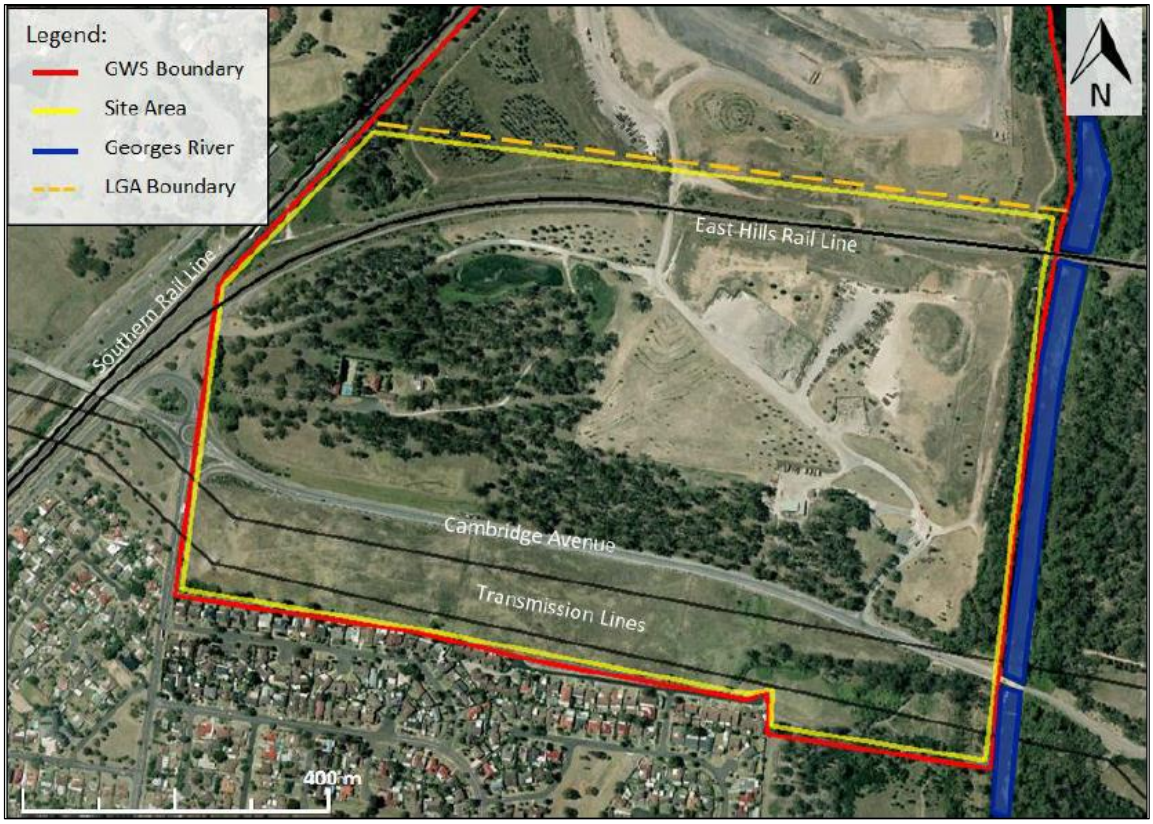

Figure 1-4: Southern parcel of GWS and proposed rezoning site area.

1.5 Consideration of SSD DGRs and Council input

Director-General's Requirements (DGRs) were provided by the Department of Planning in December 2013. Specifically in relation to ecological issues, the DGRs required the following under the heading of Key Issues:

"Biodiversity – including an assessment of any potential impacts on any threatened species, populations, endangered ecological communities, groundwater dependent ecosystems or their habitats in the region."

The DGRs also referred to a number of guidelines for biodiversity considerations.

This report has considered the DGRs for the SSD in terms of survey methodology and assessment approach as and where required.

The report has also been updated from previous versions to consider Campbelltown City Council comments on additional survey and assessment requirements.

2 GUIDELINES, POLICY AND LEGISLATION

This report has been prepared in consideration of the requirements of:

- NSW Office Environment Heritage (OEH) "Field survey methods" - http://www.environment.nsw.gov.au/threatenedspecies/
- OEH draft "Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities" – http://www.environment.nsw.gov.au/resources/nature/TBSAGuidelinesDraft.pdf
- "Threatened species survey and assessment guidelines - field survey methods for fauna: amphibians" – http://www.environment.nsw.gov.au/resources/threatenedspecies/09213amphibians.pdf
- Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);
- NSW *Environmental Planning and Assessment Act 1979* (EP&A Act);
- NSW *Threatened Species Conservation Act 1995* (TSC Act); and
- NSW *Fisheries Management Act 1994* (FM Act).

2.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Under an EPBC Act, an approval from the Commonwealth Department of Environment (DoE) is required for actions that are likely to have a significant impact on matters of national environmental significance. An action includes a project, development, undertaking, activity, or series of activities. When a proposal involves taking an action which may need approval under the EPBC Act, a referral for the proposal must be made to the Australian Government Minister for the Environment. The Act identifies the following matters of national environmental significance:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C)
- A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)

- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

2.2 NSW Environmental Planning and Assessment Act 1979 (EP&A Act)

Threatened species impact assessment is an integral part of environmental impact assessment. The objective established by Section 5A of the EP&A Act (herein referred as the 'Assessment of Significance') is to improve the standard of consideration afforded to threatened species, populations and ecological communities, and their habitats through the planning and assessment process, and to ensure that the consideration is transparent. The Assessment of Significance is the first step in considering potential impacts.

2.3 NSW Threatened Species Conservation Act 1995 (TSC Act)

Schedules 1 and 2 of the TSC Act contain lists of flora and fauna species and communities, which have been determined by the NSW Scientific Committee as being under threat of serious decline that could ultimately lead to extinction. Schedule 3 of the TSC Act contains a list of 'Key Threatening Processes' which threatens, or could potentially threaten, the survival or evolutionary development of a species, population or ecological community.

2.4 NSW Fisheries Management Act 1994 (FM Act)

The FM Act covers threatened fish and marine vegetation and associated threatening processes and is administered by the Department of Primary Industries. In 2004, the NSW Government amended the FM Act through the introduction of the Threatened Species Legislation Amendment Act 2004. This report considers any impacts that might occur to listed threatened species of fish or aquatic organisms.

3 BACKGROUND RESEARCH

The methods undertaken to complete the EA are divided into two stages, including preliminary/desktop investigations and field surveys and assessments. Preliminary investigations included literature and database reviews. Field surveys included site inspections and targeted sampling of flora, fauna and habitat.

3.1 Database Review

A list of threatened species, populations and ecological communities that had been previously reported or modelled to occur within a defined radius of the subject site (the 'investigation area'), was obtained by undertaking a search of the following online and publicly accessible databases.

3.1.1 NSW Government

The investigation area, or defined radius in which the state search was undertaken included an search of all 'known', 'predicted' and 'recorded' species in both the Liverpool and Campbelltown Local Government Areas. As a result, the 'recorded' species information includes sightings/records from this entire search area and not solely from the Site.

- NSW BioNet - http://www.bionet.nsw.gov.au/
- Threatened Species, Populations, and Ecological Communities of NSW - http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/index.aspx
- SIX Spatial Information Exchange - http://maps.six.nsw.gov.au/apps/channels_3.5/?config=vegetation

Appendix 1 contains the BioNet search results.

3.1.2 Australian Government

- The investigation area or defined radius in which the federal search was undertaken included a 10km radius of the site using the Commonwealth Department of Environment Protected Matters search tool http://www.environment.gov.au/epbc/pmst/index.html.

Appendix 2 contains the EPBC Protected Matters Search Tool Results.

3.2 Literature Review

A review of literature pertaining to the study area, the investigation area and the proposed activity was undertaken. This included internet searches and a review of relevant reports. In this instance, there were a number of previous ecological assessments in the investigation area and a number of ecological assessments undertaken more broadly within the Local Government Areas of Campbelltown and Liverpool.

The vegetation of the Campbelltown LGA was described by Benson and Howell (1990) as a mix of rugged Hawkesbury Sandstone country and rolling hills of woodlands of Grey Box *Eucalyptus moluccana*, Forest Red Gum *Eucalyptus tereticornis*, and Narrow-leaved Ironbark *Eucalyptus crebra*, on the clay soils of the Wianamatta Shale.

The vegetation communities of the Cumberland Plain were mapped by National Parks and Wildlife Services (NPWS) (2002) at a scale of 1:25,000 using aerial photograph interpretation and limited ground survey. Two vegetation communities were mapped on the GWS site, in particular, Shale Plains Woodland and Riparian Forest. The dominant overstorey species were *Eucalyptus moluccana, E. botryoides and E. botryoides/saligna* hybrid. The understorey vegetation was predominantly comprised of exotic grass and weeds (NPWS 2002).

Tozer (2003) identified 21 vascular plant communities on and adjacent to the Cumberland Plain and Hornsby Plateau. Vegetation communities were described using structural features, habitat characteristics and diagnostic species. Contemporary vegetation cover was estimated from 1:16000 scale aerial photography (1997/98) and sorted into six categories based on cover of *Eucalyptus* species. These categories are only approximately related to vegetation condition.

The 1:100 000 scale vegetation mapping accompanying Tozer (2003) was a larger scale version of the 1:25 000 digital maps released on CD Rom by NPWS (2002). The Tozer (2003) and NPWS (2002) communities mapped on the GWS site were equivalent to Endangered Ecological Communities (EECs) listed under the TSC Act (see Table 3-1).

Table 3-1: Previously Mapped Vegetation Communities and Endangered Ecological Communities

Tozer(2003)/NPWS(2002)Communities	Endangered Ecological Communities
10–Shale Plains Woodland	Cumberland Plain Woodland
12–Riparian Forest	River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions

3.2.1 Eco Logical Studies

In 2006, Eco Logical prepared a preliminary ecological assessment of the Glenfield Waste Site (Eco Logical 2006). The assessment involved a review of background literature and mapping and a field survey to validate the condition and recovery potential of the vegetation communities, followed by the application of an OEH (formerly the Department of Environment and Conservation (DEC)) approved ecological constraint analysis process and mapping of outcomes.

The review consisted of a consideration of the DEC Western Sydney Vegetation mapping, as described in NPWS (2002). The investigation area was inspected on 16 March 2006 and flora and fauna species were recorded. A total of 38 plant species were recorded in the forest and riparian vegetation, of which 20 were native and 18 exotic. A total of 23 fauna species (all birds) were recorded by Eco Logical during the March 2006 field survey, with no threatened species observed.

The Eco Logical 2006 report described the woodland vegetation in the western portion of the investigation area as containing more mature and dispersed trees than in the eastern portion, with tree hollows representing potential fauna habitat, a low level of leaf litter and high grass cover with evidence of grazing and slashing. The vegetation in the eastern portion of the investigation area was described as having younger trees with an understorey of scattered shrubs and ground cover, with less grass cover and deeper litter layers than in the west. The vegetation adjacent to the Georges River was described by Eco Logical as riparian forest with weedy banks and a mixed native understorey.

3.2.2 ACA Studies

A study conducted by ACA (2006) described the vegetation in the investigation area as woodland with three characteristic tree species, namely *Eucalyptus eugenioides, E. moluccana* and *E. tereticornis.*

It was concluded that the woodland vegetation recorded on the site meets the criteria for Cumberland Plain Woodland under both the EPBC Act and TSC Act. It was recommended that to come to a conclusive determination as to the classification of woodland vegetation on site further studies were required.

3.2.3 SLR Studies

As discussed in the ACA (2006) Report, further field studies were required in order to come to a conclusive determination as to the classification of woodland vegetation on site. As a result, SLR Consulting were engaged by EPS with the aim of producing a conclusive Cumberland Plain Woodland Assessment Report.

SLR Consulting were tasked with the following:

- To undertake background research regarding any existing vegetation mapping of the subject site;
- To undertake a site survey:
    - To verify the vegetation present;
    - To collect a detailed flora species list;
    - To undertake a series of flora survey quadrats; and
- To determine likely ecological constraints to future rezoning and development of the site.

From the survey work carried out in 2014, SLR has been able to determine the extent, nature and condition of native vegetation on the subject site. The SLR results concluded that significant portions of the subject site have long been cleared, modified and used as part of the existing recycling facility, however, the band of vegetation in the southern, central and western parts contain a canopy of eucalypts which are characteristic of the Cumberland Plain Woodland (CPW) community and would constitute an example of this community (SLR 2014).

As stated by SLR 2014 the CPW community is listed in the TSC Act as a "*critically endangered ecological community*" (CEEC), and is also listed as part of a CEEC in the EPBC Act.

SLR conducted a preliminary assessment on the condition state of the CPW community in accordance with the threshold levels under the EPBC Act. This preliminary assessment indicates that the subject site supports vegetation that meets the criteria for CPW which is listed as being a CEEC under Federal Legislation (SLR November 2014) (Appendix 16).

4 PRELIMINARY ECOLOGICAL INVESTIGATION

4.1 Overview

Preliminary studies and fieldwork were undertaken in the months of March through to July of 2012, refer to Appendix 14 for specific dates. Both flora and fauna surveys were conducted at varying times to assess the likelihood of any threatened flora, fauna or endangered ecological communities being present.

Field surveys were undertaken in consideration of OEH's: *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft, November 2004.*

Targeted field surveys were conducted for arboreal mammals, microchiropteran bats and birds (diurnal and nocturnal). The field surveys for diurnal birds were undertaken during the daylight hours (900hrs-1300hrs) on 30th May 2012 and 21st June 2012 (0800-1400hrs). Field surveys for arboreal mammals and microchiropteran bats were undertaken on the evenings of the 20th and 21st June 2012. General surveys included searches for the presence or signs of any fauna including the presence of tracks, scats (fecal pellets), hair, scratches etc.

4.2 Flora and Vegetation Community Survey

Preliminary floristic surveys of the site occurred on the 30th May and 12th July 2012. Vegetation was surveyed by using the targeted random meander method and by the collection of floristic data using quadrats and transects.

Floristic information was collected from 8 quadrats of 20 x 20 metres in size, distributed across the investigation area. The data recorded in the quadrats were consistent with the standards used by the Office of Environment and Heritage and the Royal Botanic Gardens for general survey as well as with the BioBanking/Biodiversity Certification methodology.

The data recorded included:

- Geographical information (MGA, location, topographic map);
- Physical features (topographic position, elevation, slope, aspect, general soil type);
- Disturbance history (including grazing, clearing/logging, weeds and fire);
- Structural features of the vegetation according to Specht *et al.* (1995) (numbers and types of layers present, their heights, canopy cover, and three most dominant species in each layer); and
- Species and their cover abundance using the following modified Braun-Blanquet seven point scale:
    - 1: <5% cover – rare, 3 or fewer individuals;
    - 2: <5% cover – uncommon, >3 individuals and sparsely scattered;
    - 3: <5% cover – common, individuals consistent throughout the plot;
    - 4a: <5% cover – abundant, many individuals throughout the plot;
    - 4b: 5%-25% cover;
    - 5: 25%-50% cover;
    - 6: 50%-75% cover; and
    - 7: 75%-100% cover.

Specimens of plants were collected for later identification if they were not readily identifiable in the field. Such specimens were identified according to Harden (1990, 1991, 1992, 1993) and the interactive flora (Flora Online) provided online by NSW National Herbarium of the Royal Botanic Gardens (http://plantnet.rbgsyd.nsw.gov.au/floraonline.htm).

4.3 Fauna Survey

Field surveys were undertaken to ascertain the presence, distribution and quality of fauna habitat and a range of fauna including arboreal and terrestrial mammals, bats, birds, amphibians and reptiles. The expectation of the types of animals (and habitats) potentially present on the site, and the design and implementation of field surveys, were based on the review of literature.

During an inspection on 28th March 2012 it was evident that the vegetation supported a disturbed understory comprised of predominantly native and exotic groundcover and grasses. There was no mid-storey nor logs, rocks or leaf litter. It was concluded that the investigation area was unlikely to provide habitat for ground dwelling/terrestrial mammals and as such targeted fauna trapping and reptile searches were not considered applicable or necessary.

Arboreal and Terrestrial Mammals

Mammal surveys were conducted in the evenings of 20th and 21st June 2012. The technique employed involved a person surveying on foot with a spotlight for two separate one hour searches over two consecutive nights. The transect walked during each period, was approximately one kilometre long (Figure 4-1). During the search, the spotlight was shone into the vegetative canopy with the light placed at eye height of the surveyor so that any eye-shine was detected. The weather on the evenings of the surveys was fine with little or no wind.

Bats

Microchiropteran bat surveys were conducted in the evenings of 20th and 21st June 2012 using a commercially available ultrasonic recorder (Anabat) situated within a number of locations, (Figure 4-2) in particular, potential roost sites or flyways as well as near the dam. Surveys were conducted during optimal conditions with little or no wind or rain. Any echolocation calls emitted by bats and detected by the Anabat microphone were recorded (Appendix 11) and sent for identification and interpretation.

Birds

Diurnal bird surveys were conducted on 30th May 2012 from 0900hrs-1300hrs and 21st June 2012 (0800-1400hrs) by an experienced ornithologist in the woodland. All birds were identified by observation or by call. Targeted surveys were undertaken during optimal conditions in the morning with little or no wind or rain. Other bird observations occurred as opportunistic sightings whilst undertaking other assessments.

Nocturnal bird surveys were conducted on evenings of 20th and 21st June 2012. Surveys were undertaken in conjunction with spotlighting and bat detection assessments whereby an ornithologist would detect the presence of any nocturnal birds by either observations or call. Surveys were only undertaken during optimal conditions, such as little or no rain.

Amphibians and Reptiles

Amphibian and reptile surveys were conducted on 30th May 2012 (0900hrs-1300hrs) and 21st June 2012 (0800-1400hrs) as well as on evenings of 20th and 21st June 2012. Surveys were conducted by an experienced ecologist undertaking an area search of the woodland and associated aquatic environs. Other observations occurred as opportunistic sightings whilst undertaking other assessments.

4.4 Habitat Assessment

Habitat is defined under the TSC Act, as an area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community and includes any biotic or abiotic component. The investigation area was surveyed on the 30th May and 21st June 2012 for the presence of fauna habitats, including:

- Nectar and seed producing trees and shrubs;
- Leaf litter and fallen timber;
- Open water, wetlands and soaks;
- Hollow bearing trees; and
- Cleared areas.

The survey for these habitat characteristics was conducted across the investigation area in order to ascertain the type, distribution and abundance of these resources. The location (coordinates) of all nectar and seed producing trees and shrubs, leaf litter and fallen timber, hollow-bearing trees and cleared areas was obtained using a hand-held Global Positioning System (GPS) and recorded on a data sheet. Other habitat data, such as the species of tree, the number and size of hollows, height/density (structure) of vegetation layers, leaf litter, fallen timber, stags, rock shelves, soil type, presence of water and any human-made habitats were also recorded.

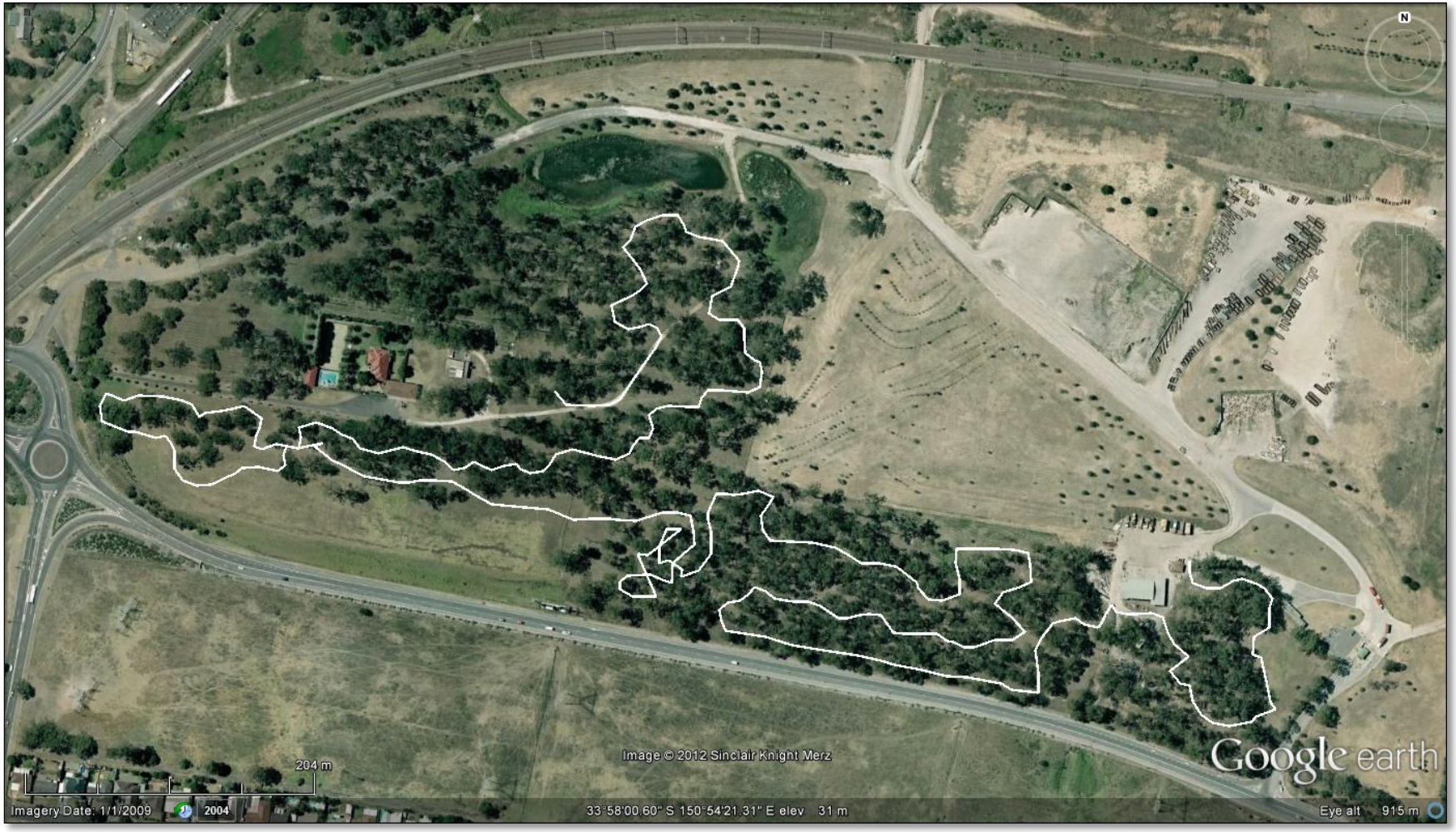

Figure 4-1: Aerial photo of investigation area showing spotlighting transect/survey route (20 June 2012).

Figure 4-2: Investigation area showing the two locations chosen for Anabat recordings on the nights of the 20 and 21 June 2012.

4.5 Results, Discussion and Conclusions from Preliminary Ecological Investigations

This section details the results of desktop assessments, database reviews, and field surveys and provides a brief interpretation and discussion of these results.

4.5.1 Vegetation Survey Results

Eighty six species of flora were observed in the investigation area. Of these, 47 were native and 39 exotic. They were represented by 38 families, the most species being within the Poaceae (15 species). No threatened species or endangered populations were recorded on site during the survey. The flora list can be found in Appendix 9.

The floristic pattern exhibited is typical of grassy woodland and the canopy trees are principally *Eucalyptus moluccana* (Grey Box) with *Eucalyptus tereticornis* (Forest Red Gum) being co-dominant. The canopy trees are in general of an even age and are regrowth estimated no older than 60 years. There were a total of 38 hollow bearing trees with hollows of various sizes present across the investigation area.

4.5.2 Fauna Survey Results

A total of 22 fauna species were recorded, which comprised 19 birds, two frogs and one mammal. In addition, Anabat recordings were undertaken with a number of microchiropteran bat species recorded including two species being the Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) listed as Vulnerable under the TSC Act.

All bird species recorded are common in urban/semi-urban habitats on the east coast of Australia and are of low conservation significance. Bird species were observed either in trees, on the ground and/or in flight either in or adjacent to the woodland vegetation. Other bird species, mostly waterbirds were observed either in or on the edge of the open water/dam north of the homestead. The fauna list can be found in Appendix 10.

4.5.3 Fauna Habitat

The investigation area supported woodland vegetation with an overstorey predominantly of one age class and strata, with no mid-storey and no juvenile understory or immature tree species present. There was no understory shrub layer present, and as such, the understory lacked any structural complexity, supporting only groundcover and grass species which had been subject to regular mowing and provided some minor foraging habitat for predominantly common fauna species only. The investigation area and study area did not support any declared critical habitat in NSW, listed under the TSC Act.

Nectar and Seed Resources

Fauna habitat comprised of nectar and seed producing Eucalypts, such as Grey Box *Eucalyptus moluccana* and to a lesser extent, Forest Red Gum *E. tereticornis* and Narrow-leaved Ironbark *E. crebra*. Other nectar and seed producing trees comprised White Feather Honey myrtle *Melaleuca decora* and one Broad-leaved Apple *Angophora subvelutina*. The investigation area was dominated by the occurrence of *E. moluccana* and consisted of scattered trees predominantly of one age and strata (canopy) with no mid-storey of juvenile species. As such, the vegetation lacked structural complexity. Other potential seed resources present were from native and exotic grasses as well as River She-Oak *Casuarina cunninghamiana*, which had been planted on the edges of the woodland.

Leaf Litter and Fallen Timber

The investigation area had been regularly slashed and managed and there was a paucity of leaf litter and fallen timber. Two piles of timber occurred at two locations within the woodland and appeared to provide habitat for the European Rabbit *Oryctolagus cuniculus*, with burrows and scats being observed in these areas.

Open Water, Wetlands and Soaks

The investigation area supported an area of open water, which was a farm dam situated directly north of the homestead. This open water provided suitable habitat for common waterbird species such as the Eurasian Coot, Australian White Ibis and Australian Wood Duck. A soak or wet area was observed on the northeast margin of the woodland. Some Common Eastern Froglets and Whistling Tree Frogs were heard calling from this location.

Hollow Bearing Trees

The investigation area supported a relatively high number of hollow bearing trees across most of the investigation area (Appendix 12). The location of these across the investigation area can be seen in Figure 4-3. The dominant hollow bearing tree was *E. moluccana* with hollows occurring either in dead horizontal branches, vertical spouts and dead trunks and/or dead branches or trunk hollows and live and/or dead trees. There was little evidence of these hollows being used by fauna, other than two trees which were supporting Galahs at the time of survey. Hollows were also present in five *E. tereticornis* and one *A. floribunda*.

Cleared Areas

The Glenfield Waste Site has been in single family ownership since the 1800's with the understorey and groundcover being continually maintained for a number of purposes over that period. From aerial photography dating back to the 1930's it is clear that the GWS site was previously used for orchards and farming. In photographs dating from the 1950's through to the 1970's it is evident that the vegetated portion of the site has had the understorey and groundcover managed throughout the woodland. Much of the site, including the woodland portion, has been used for grazing, general agricultural purposes and more recently, slashed for fire hazard reduction at Campbelltown City Council's request. As the investigation area has been regularly slashed and otherwise managed such that a predominantly cleared understorey comprised of native and exotic grasses and herbs occurs across the entire investigation area, the understorey was not likely to provide habitat for threatened bird or mammal species, moreover, the cleared understorey was likely to provide foraging habitat for common bird species such as Common Myna, Magpie Lark, Eastern Rosella, Common Starling etc.

4.5.4 Habitat Connectivity

The investigation area is bounded by a number of significant barriers to fauna movement, including Cambridge Avenue, the Main Southern Railway Line, the Southern Sydney Freight Line, East Hills Railway Line, internal roads, the Georges River and the operational quarry, landfill and recycling areas within the GWS precinct. Similarly, the study area (within 10km) is subject to disturbance and isolation of vegetative areas, thus reducing the potential movement of small and terrestrial mammals, reptiles, amphibians and birds and bats into and through the investigation area. Larger terrestrial mammals that may occur in the locality would be excluded from much of the study area as a result.

Habitat connectivity within the study area is greatest within the riparian vegetation associated with Georges River, which maintains connectivity with riparian vegetation to the north and south. This riparian corridor would facilitate the movement of less mobile species, including cover-dependent species, larger terrestrial mammals and arboreal mammals.

South east and east of the Georges River is the adjacent Holsworthy Military Area. Hyder Consulting (2012) reported that this site supports approximately 18,000 hectares of continuous native vegetation. The diversity of vegetation communities within the Military Area includes forests, woodlands, heath and swamp communities, which in turn provide important habitat to threatened flora and fauna. Highly mobile fauna such as birds and some mammals may predominantly reside within the Holsworthy Military Area and use the limited resources offered by the subject site on a transient basis.

Figure 4-3: Aerial photo of investigation area showing locations of hollow bearing trees.

4.6 Preliminary Study Conclusions

The preliminary studies revealed that:

- A total of 86 species of flora were observed in the investigation area. Of these, 47 were native and 39 exotic. They were represented by 38 families, the most species being within the Poaceae family (15 species);
- No threatened flora species or endangered flora populations were recorded on site during surveys;
- The abiotic characteristics of the investigation area revealed that the site could support some Cumberland Plain Woodland. These include the soil landscape, altitude, topographic position and geographic location;
- The site supports Grey Box and some areas of native understorey consistent with Cumberland Plain Woodland;
- Though none were identified, the investigation area was assessed as having suitable habitat for a total of 16 threatened and migratory fauna species. Of these, there were ten bird species (eight passerines/perching birds and two shorebirds) and six mammal species (bats);
- No threatened frog, threatened waterbird, threatened arboreal mammal, or threatened fish species were considered likely to have habitat within the investigation area or occur on the investigation area;
- Fauna habitat present comprised of nectar and seed producing Eucalypts, such as Grey Box *Eucalyptus moluccana* and to a lesser extent, Forest Red Gum *E. tereticornis* and Narrow-leaved Ironbark *E. crebra*;
- The investigation area supported a farm dam which provided an area of open, deep water for common waterbird species;
- The investigation area had been regularly slashed and managed such that there was a paucity of leaf litter and fallen timber across the site and was likely to provide some foraging habitat for only common bird species such as the Common Myna, Magpie Lark, Eastern Rosella, Common Starling etc;
- The investigation area (woodland) supported a relatively high number of hollow bearing trees; and
- The investigation area is bounded by a number of significant barriers to fauna movement, including Cambridge Avenue, the Main Southern and East Hills Railway Lines, internal roads, and the tip site within the GWS precinct, which would limit the potential use of and movement through the investigation area by threatened fauna.

5 RECENT ECOLOGICAL INVESTIGATIONS

5.1 Background

The following section outlines additional fieldwork undertaken to provide a complete and robust picture of the ecological values of the southern parcel of the GWS site.

Subsequent to the preliminary studies, further assessment has occurred that addresses the comments raised by the Office of Environment and Heritage (OEH) in their letter received November 2013. This has included addressing:

- The likelihood of Cumberland Plain Woodland, listed as a Critically Endangered Ecological Community under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environmental Protection and Biodiversity Conservation Act 1999* being present on site;
- The likelihood of two bat species Eastern Bentwing-bat (*Minioptera schreibersii*) and the Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) both listed as Vulnerable under the TSC Act being present on site;
- The likelihood of the site being suitable habitat for 16 threatened and migratory fauna species;
- The presence of koala food trees on site; and
- The likelihood of the threatened flora species *Pimelea spicata* (Spiked-rice flower) being present.

Additional surveys were also undertaken in 2015 to ensure that Campbelltown City Council's concerns about previous surveys occurring in cooler seasons were addressed. The 2015 surveys occurred in February and targeted:

- Green and Golden Bell Frog (in accordance with Commonwealth and State guidelines) over four nights;
- Additional microbat surveys over four nights; and
- Opportunistic surveys for all other species of flora and fauna in the surveyed areas, with a focus on threatened species.

These were also the species that Council considered warranted further surveys.

Appendix 14 includes the times and dates of all fieldworks undertaken for recent survey work.

Appendix 9 and 10 includes flora and fauna species respectively recorded during these and previous surveys.

5.2 Database Review

Raw data obtained from the more recent searches of NSW and Commonwealth databases are shown in Appendices 1 and 2 and are summarised below:

- A total of 87 threatened fauna species listed under TSC Act and / or EPBC Act had either been recorded, known or predicted to occur within the Liverpool/Campbelltown Local Government Area / EPBC 10km radius;
- A total of 90 threatened flora species listed under TSC Act and / or EPBC Act had either been recorded, known or predicted to occur within the Liverpool/Campbelltown Local Government Area/ EPBC 10km radius;
- A total of 27 Endangered Ecological Communities (EEC) listed under TSC Act and / or EPBC Act had either been recorded, known or predicted to occur within the Liverpool/Campbelltown Local Government Area/ EPBC 10km radius;
- A total of 34 Listed Migratory species, listed under EPBC Act may occur within the investigation area;
- No critical habitat listed under the TSC Act occurred within the investigation area;
- A total of 34 Key Threatening Processes (KTP's) listed under the TSC Act were predicted to occur within the investigation area;
- A total of 53 invasive species listed under the EPBC Act were predicted to occur within the investigation area; and
- No threatened species or communities as listed under the FM Act have been recorded in the Campbelltown LGA (Department of Primary Industries – Fishing and Aquaculture Threatened & protected species - records viewer).

Each of these species, EEC, KTPs and invasive species were thoroughly considered and assessed to ascertain whether they were likely to occur on the subject site and/or be impacted by the proposed activity (Appendices 3-6).

5.3 Targeted Flora and Vegetation Community Surveys

5.3.1 Plants

In addition to the previous numerous flora surveys, a targeted flora survey was conducted on the 17th (1000-1600) December 2013 to determine the presence or absence of the flora species *Pimelea spicata* (Spiked-rice flower) listed as Endangered under the EPBC Act and TSC Act. In accordance with the OEH *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft, November 2004* the random meander technique was conducted on the southern parcel of the GWS site to search for this particular species. All other threatened flora were also considered during this survey. The search area consisted of those areas primarily within the most suitable habitat. Survey efforts included one hour of targeted surveys per hectare of suitable habitat, or 12 hours for the entire 12 ha of suitable habitat. *Pimelea spicata* was not observed during the field survey. No other threatened flora species were recorded. Further detailed information can be obtained in the Threatened Species Survey Report in Appendix 8. No threatened flora species are therefore known to occur on the southern portion of the GWS site.

5.3.2 Vegetation Communities

SLR (refer to Appendices 15 and 16) undertook further assessments of the vegetation on the site, including vegetation community mapping, BioBanking plot field surveys and assessment of the status of the vegetation communities at a State and Federal level. Refer to these Appendices for detailed information.

Figure 7 in Appendix 15 provides a map of the vegetation communities on the site, including their condition. The occurrence of Cumberland Plain Woodland (EPBC Act CEEC and TSC Act CEEC) and River-Flat Eucalypt Forest (TSC Act EEC) is discussed in detail in those documents. This report includes as assessment of the likely impacts to occur to these vegetation communities as a result of the project.

5.4 Targeted Fauna Survey

Further detailed field surveys were undertaken in the southern portion of the GWS site to ascertain the presence of certain fauna species considered 'likely' to occur on site. This involved using a range of methods such as targeted random meander surveys and spotlighting. To determine which threatened fauna species to target during surveys, a map was created using recorded sightings from the OEH threatened species database. This provided EPS's ecologist with an indication as to those species considered likely to occur on the site. This map can be found in Appendix 18. The records on this map was used in conjunction with the known threatened species records from the locality.

5.4.1 Arboreal and Terrestrial Mammals

Arboreal mammal surveys were conducted on the evenings of 29th of April (1800-2000hrs) and 25th June 2014 (1730-2030hrs). The technique employed involved surveying on foot with a spotlight (for two separate one hour searches over two separate nights). The area walked during each searching period was approximately one kilometre. During the search, the spotlight was shone into the vegetative canopy with the light placed at eye height of the surveyor so that any eye-shine was detected. The weather on the evenings of the surveys was fine with no wind. Subsequent targeted Green and Golden Bell Frog and bat surveys in February 2015 also included some additional opportunistic spotlighting of trees within the woodland area.

5.4.2 Bats

Microchiropteran bat recordings were initially conducted on the evenings of 29th of April and 25th, 26th and 27th June 2014 using a commercially available ultrasonic recorder (Anabat). Surveys were conducted during optimal conditions, during times of little or no wind or rain and were for a period of dusk to dawn. Follow-up microbat surveys using an Anabat were undertaken on the nights of 24th, 25th, 26th and 27th February 2015. See Appendix 14 for details on these surveys.

Recorded echolocation calls were recorded and were sent to Dr Anna McConville at Echo Ecology for interpretation and identification. This Bat Call Identification Report is provided in Appendix 13.

The Bat Call Identification Report confirms that from the May 2014 survey a total of 303 call sequences were able to be analysed and of this number 106 call sequences (35%) were able to be confidently identified to species level. The February 2015 survey resulted in a total of 1,372 call sequences being able to be analysed. Of these bat calls, 326 call sequences (24%) were able to be confidently identified to species level.

The following microbat species were confidently recorded during the EPS surveys:

- *Chalinolobus gouldii* (Gould's wattled bat)
- *Chalinolobus morio* (Chocolate wattled bat)
- ***Miniopterus australis*** **(Little bentwing bat)**
- ***Miniopterus schreibersii oceanensis*** **(Eastern bentwing bat)**
- ***Mormopterus*** **(*Micronomus*)** ***norfolkensis*** **(East-coast freetail bat)**
- *Mormopterus* (*Ozimops*) *ridei* (Eastern freetail bat)
- ***Saccolaimus flaviventris*** **(Yellow-bellied sheathtail bat)**
- *Tadarida australis* (White-striped freetail bat)
- *Vespadelus pumilus* (Eastern forest bat)

Threatened bats recorded are those denoted by bold text in the list above.

Seven other microbat species were considered to potentially occur within the site, however could not be confidently identified. Three of the seven species potentially occurring are threatened species including the Eastern false pipistrelle (*Falsistrellus tasmaniensis*), Large-footed myotis (*Myotis macropus*) and Greater broad-nosed bat (*Scoteanax rueppellii*). These species have been assessed in Appendix 3 and if considered likely to occur on site, they were further assessed through the Seven-part test in Appendix 7.

5.4.3 Koala

The dominant tree species on site consist of Grey Box (*Eucalyptus moluccana*) and to a lesser extent, Forest Red Gum (*E. tereticornis*) and Narrow-leaved Ironbark (*E. crebra*). *Eucalyptus tereticornis* is listed under SEPP 44 Schedule 2 as being a Koala Feed Tree and *Eucalyptus moluccana* is determined to be a 'Secondary' Koala feed tree species as listed under the NSW OEH Koala Recovery Plan in the Sydney Metropolitan Catchment Management Area (DECC 2008). The City of Campbelltown Koala Habitat Planning Map shows the remnant woodland on the site that would be impacted by the projects to be Marginal Koala habitat quality, with proposed retained habitats along the Georges River being shown as Unknown habitat quality for Koalas.

The site is bound by a number of potential barriers to larger terrestrial mammal movement including Cambridge Avenue and Moorebank Avenue, the main south passenger and Southern Sydney Freight railway lines to the west, the East Hills railway line traversing the site and significant residential sprawl surrounding the GWS site. The site is also bounded by a combination of both chain mesh fencing and colourbond fencing that, in combination with the above roads, rail and residential areas, would severely limit Koala movement into the site. The site is exposed, on a daily basis, to considerable anthropogenic disturbance from the operation of the waste facility including noise and dust from truck movement. The site is considered highly degraded and partially fragmented from larger tracts of vegetation that may be used by this species as part of a larger home range.

No anecdotal records or indications of the presence of Koalas were recorded and it is considered unlikely that the remnant woodland on the site is important for the local Koala population.

5.4.4 Birds

Diurnal bird surveys were conducted on 29th April 2014 from 1430hrs-1630hrs and 30th April 2014 from 0800-1000hrs. Additional diurnal bird surveys were also completed on the 24th, 25th, 26th and 27th February 2015. See Appendix 14 for details on these surveys and refer to Appendix 10 for the recorded species list.

All birds were identified by observation or by call interpretation (**Error! Reference source not found.**). Targeted surveys were undertaken during the morning and afternoon period with little or no wind or rain, thus during optimal conditions for detecting the presence of bird species. Other bird observations occurred as opportunistic sightings whilst undertaking other assessments.

Nocturnal bird surveys were conducted on the evening of 29th April (1800-2000hrs) and 25th June 2014 (1730-2030hrs). Surveys were undertaken in conjunction with spotlighting and bat detection assessments by either visual observations or call interpretation. Surveys were only undertaken during optimal conditions, such as little or no rain.

Recorded diurnal and nocturnal bird species were species either highly tolerant to disturbance or those associated with the aquatic environs contained in the dam. No threatened bird species were recorded.

5.4.5 Amphibians and Reptiles

Additional amphibian and reptile surveys were conducted on 29th (1430hrs-1630hrs) and 30th (0800-1100hrs) of April 2014 as well as on the evening of 29th April (1800-2000hrs) and 25th June 2014 (1730-2030hrs). Surveys were conducted by the EPS ecologist in the woodland and adjoining dam. Other observations occurred as opportunistic sightings whilst undertaking other assessments.

A targeted survey was conducted on 29th (1430hrs-1630hrs) and 30th (0800-1100hrs) of April 2014 to determine the presence or absence of *Litoria aurea* (Green and Golden Bell Frog) which is listed as Endangered in the schedules of the TSC Act and Vulnerable under the EPBC Act. In accordance with the OEH *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft, November 2004* the random meander technique was conducted on the southern parcel of the GWS site to search for this species. The edges and surrounding area of the artificial dam/s were examined thoroughly for any evidence of the Green and Golden Bell Frog. Night time spotlighting surveys using call playback technique were also employed.

Due to Council comments on the previous surveys being undertaken in cooler month, follow-up targeted Green and Golden Bell Frog surveys were undertaken in February 2015. Refer to Appendix 14 for details, although surveys were undertaken over total of five days. Survey methodology was in accordance with the Commonwealth and State surveys guidelines for this species and included both diurnal and nocturnal searches, spotlighting, call playback and dip netting for tadpoles.

Figure 5-1 includes targeted fauna survey locations.

Results of all of these combined comprehensive surveys revealed no evidence of the presence of Green and Golden Bell Frog. Eastern Gambusia (*Gambusia holbrooki*) was recorded in high numbers in the main dam and it is a known predatory fish of Green and Golden Bell Frog eggs. The habitat quality was considered to be relatively low for Green and Golden Bell Frog, with limited fringing aquatic vegetation including Typha which covered about 5% of the dam water surface. Numerous surveys over a number of years and seasons have not recorded this species and it is considered unlikely that it is present on the site. Common frogs recorded during surveys included Common Eastern Froglet, Striped Marsh Frog and Whistling Tree Frog and these are generally known to be tolerant of disturbed aquatic habitats.

5.4.6 Cumberland Plain Land Snail

A targeted survey was conducted on 29th (1430hrs-1630hrs) and 30th (0800-1100hrs) of April 2014 to determine the presence or absence of *Meridolum corneovirens* (Cumberland Plain Land Snail), which is listed as Endangered in the schedule of the TSC Act. In accordance with the OEH *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft, November 2004* the random meander technique was conducted on the southern parcel of the GWS site to search for this species (Figure 5-1), particularly being focussed on the remanent woodland area.

Searches involved targeting habitat features likely to provide shelter for these two species such as in and around trees with focus on loose or shedding bark, under manmade objects such as tin sheets, old tyres and wood piles.

No evidence of Cumberland Plain Land Snail (including empty shells) was located during the targeted survey. This is likely linked to the ongoing underscrubbing of the woodland over a number of years for bushfire protection purposes, which has significantly reduced the microhabitat features (such as bark, logs etc) that would otherwise provide habitat for this species.

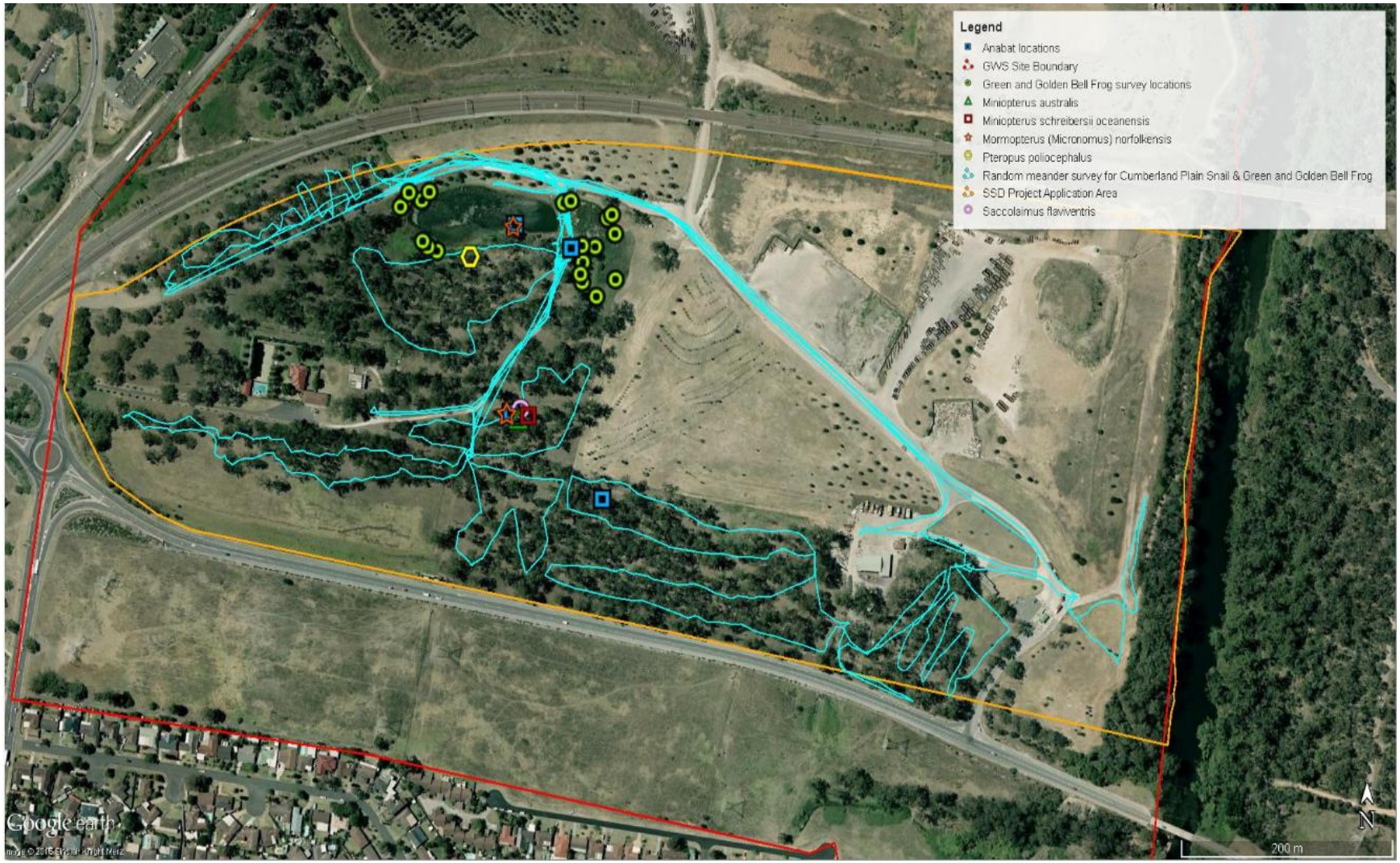

Figure 5-1: Targeted fauna surveys for the Threatened Species Locations.

5.4.7 Opportunistic Observations

A single Grey-headed Flying Fox was observed in a tree at the edge of the dam on the nights of the 24th and 25th February. This species is listed as Vulnerable under both the EPBC Act and TSC Act.

It is likely that this woodland forms part of this species greater foraging habitat in the region.

No permanent camp is known to occur on the site or considered likely. The nearest known camp is located approximately 3.5km to the south at Macquarie Fields and the Commonwealth DoE has identified that the Macquarie Fields camp is Nationally Important.

6 IMPACT ASSESSMENT

6.1 Threatened species assessment

Appendix 3 contains the threatened species assessment table. The table provides an analysis of all threatened species and populations recorded or considered likely, to determine those that require further assessment under a 7 part test or EPBC assessment. Similarly, Appendix 4 contains an assessment of likely threatened ecological communities to determine those that require further detailed impact assessment.

Detailed impact assessment was considered to be warranted for those species, populations and ecological communities known to be present, or with a moderate or higher chance of potential impact or those species that could not be discounted via the targeted surveys.

The following threatened species, populations or ecological communities were recorded on the site and required detailed assessments:

Species

- *Miniopterus australis* (Little bentwing bat) (TSC Act Vulnerable)
- *Miniopterus schreibersii oceanensis* (Eastern bentwing bat) (TSC Act Vulnerable)
- *Mormopterus* (*Micronomus*) *norfolkensis* (East-coast freetail bat) (TSC Act Vulnerable)
- *Saccolaimus flaviventris* (Yellow-bellied sheathtail bat) (TSC Act Vulnerable)
- *Pteropus poliocephalus* (Grey-headed Flying-fox) (TSC Act Vulnerable, EPBC Act Vulnerable)

Populations

- None

Threatened Ecological Communities

- Cumberland Plain Woodland (TSC Act Critically Endangered) / Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (EPBC Act Critically Endangered)
- River-Flat Eucalypt Forest on Coastal Floodplains (TSC Act Endangered)

In additional, as a precautionary measure, impact assessments have been completed for the following species that are considered to have some potential habitat on the site. It should be noted that none of these species were recorded during targeted surveys:

Species

- *Pimelea spicata* (Spiked Rice-flower) (TSC Act Endangered, EPBC Act Endangered)
- *Phascolarctos cinereus* (Koala) (TSC Act Vulnerable, EPBC Act Vulnerable)
- *Litoria aurea* (Green and Golden Bell Frog) (TSC Act Endangered, EPBC Act Vulnerable)
- *Meridolum corneovirens* (Cumberland Plain Land Snail) (TSC Act Endangered)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat) (TSC Act Vulnerable)
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) (TSC Act Vulnerable)
- *Myotis macropus* (Large-footed myotis) (TSC Act Vulnerable)

The following sections summarise the results of the detailed assessments under the TSC Act and EPBC Act, which are provided in Appendix 7.

6.2 Environmental Protection and Biodiversity Conservation Act 1999

It is considered that the Matters of National Environmental Significance are well understood on the site as a result of the numerous previous and current investigations. The investigations have revealed the following:

- The Critically Endangered ecological community Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is present within the subject site and is considered to be the main Matter of National Environmental Significance requiring consideration;
- Individual Grey-headed Flying Fox (Vulnerable under EPBC Act) were recorded at the edge of the woodland next to the dam;
- No other threatened species or truly migratory species were recorded; and
- Potentially occurring species such as Green and Golden Bell Frog, Koala and Spiked Rice Flower were not considered likely to actually occur following specific targeted surveys. The primary reason for this was the isolation of the habitats on the site combined with the high level of historical disturbance being evident in the habitats that do remain.

In terms of the Grey-headed Flying Fox, no camps are present on the site. A camp is known to occur 3.5km to the south at Macquarie Fields. It is likely that this species only uses the eucalypts on the site as part of a greater foraging range throughout the region. The expansive habitats throughout areas such as Holsworthy defence lands mean that it is unlikely that this species would be impacted to any significant degree by the proposals. Based on the EPBC Act guidelines for this species, an EPBC Referral would not be required as the proposal is unlikely to impact the viability of a camp.

Assessments of the occurrence of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community have been undertaken and are provided in Appendices 4, 7 and 15.

These assessments concluded that a Referral under the EPBC Act should be submitted in relation to the impacts upon the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community. This is primarily due to the total area of the community that is to be removed (despite the condition of the community being disturbed by underscrubbing).

6.3 Threatened Species Conservation Act 1995 & Environmental Planning & Assessment Act 1979

An assessment of the SSD and rezoning impacts has been completed under the TSC Act via seven-part tests for the following species and communities (those recorded on-site are in bold text):

Threatened Ecological Communities

Cumberland Plain Woodland
River-Flat Eucalypt Forest on Coastal Floodplains

Fauna

Phascolarctos cinereus	Koala
Litoria aurea	Green and Golden Bell Frog
Meridolum corneovirens	Cumberland Plain Land Snail
Pteropus poliocephalus	**Grey-headed Flying-fox**

Hollow/shelter dependent microbats

Saccolaimus flaviventris	**Yellow-bellied Sheathtail-bat**
Mormopterus norfolkensis	**East-coast Freetail-bat**
Scoteanax rueppellii	Greater Broad-nosed Bat
Falsistrellus tasmaniensis	Eastern False Pipistrelle
Miniopterus australis	**Little Bentwing bat**
Miniopterus schreibersii oceanensis	**Eastern Bentwing bat**
Myotis macropus	Large-footed myotis

Flora

Pimelea spicata	Spiked Rice-flower

It was considered unlikely that a significant impact on these threatened species and communities would occur (see Appendix 7).

Mitigation and compensatory measures for those threatened species to be impacted are outlined in Section 7.

6.4 Fisheries Management Act

The Department of Primary Industries (Fishing and Aquaculture) Records Viewer indicated that there were no know records of threatened species or ecological communities listed under the FM Act. It is considered unlikely that any species listed under the FM Act would be impacted by the proposal.

6.5 Key Threatening Processes

As outlined in Appendix 5 the proposal is likely to contribute to a number of key threatening processes (KTPs) listed under TSC Act in some form, however the KTPs of particular consideration are “clearing of native vegetation” and “loss of hollow-bearing trees”.

The contribution of the proposal to these KTPs is considered to be moderate and as a result, mitigation measures are proposed such as biodiversity offsets and installation of nest boxes.

In addition, equipment hygiene protocols will be enforced during construction and dead wood considered potential habitat will be moved to outside the impact zone to provide ongoing habitat to fauna. Additionally, provided the recommended equipment wash-down and hygiene protocols are followed to minimise weed spread, the proposed activity will not contribute to or enhance the presence of any invasive species listed under the EPBC Act. Refer to Appendix 6 for relevant considered species.

6.6 BioBanking Assessment

In 2014 SLR prepared two documents that inform the BioBanking and offsetting considerations for the site. These are:

- Proposed Rezoning and Expansion – Cumberland Plain Woodland Assessment Report
- BioBanking Credit Assessment (Field Work Report) EPBC Act Cumberland Plain Shale Woodlands Assessment

The earlier Cumberland Plain Woodland Assessment Report included a vegetation type and condition map and identified the classification of the vegetation on the site at a State level. This included identification of the Cumberland Plain Woodland CEEC and River-Flat Eucalypt Forest EEC.

The later report included detailed BioBanking plots being undertaken in the field to inform BioBanking calculations that outline biodiversity credit requirements. It also included an assessment of the presence of Cumberland Plain Shale Woodlands at a Commonwealth level and concluded that it was present and that an EPBC Referral should be made to the DoE.

This information will be considered in developing a biodiversity offset approach for the GWS project.

7 MITIGATION AND COMPENSATION MEASURES

As the SSD and Rezoning projects will result in unavoidable impacts to ecological values, a number of mitigation and compensation measures are proposed.

These measures consist of the following:

- Site inductions will occur to ensure site worker awareness of ecological sensitivities;
- Any construction management plans will have an ecological section to highlight the relevant issues;
- Vegetation disturbance will be limited to the minimum possible footprint;
- Clearing protocols will be implemented to ensure that clearing of vegetation and in particular the hollow-bearing trees occurs in a sensitive manner;
- Where possible, storage of construction materials will be limited to disturbed cleared areas on the site;
- Hygiene and weed management protocols will be implemented during construction on site to avoid pathogen and exotic species spread into retained areas;
- Disturbance of aquatic habitats will be minimised and erosion and sediment will be managed in accordance with industry standards;
- Nest boxes will be installed at a compensatory ratio of 2:1 for each tree hollow impacted by the project;
- The River-Flat Eucalypt Forest EEC will be fully retained and managed in perpetuity into the future for primarily ecological values; and
- A biodiversity offset strategy will be implemented in relation to the project impacts upon the Cumberland Plain Woodland ecological community.

Combined, the above measures will ensure that ecological impacts of the project will be adequately addressed.

8 CONCLUSION

The Ecological Assessment has assessed the ecological attributes of the Glenfield Waste Site, Glenfield NSW and revealed that:

- No threatened flora species or endangered flora populations were recorded on site during surveys;
- Some portions in the Southern Parcel of the GWS site are Cumberland Plain Woodland CEEC (under the TSC Act and EPBC Act) and River-Flat Eucalypt Forest EEC (under the TSC Act). The Cumberland Plain Woodland will be subject to impacts by the SSD and Rezoning components, while the River-Flat Eucalypt Forest will be retained and protected as part of the future management of the site;
- A majority of the threatened species initially considered likely to occur or to have suitable habitat were not identified during any surveys and this is considered to be related to the high level of historical disturbance on a majority of the site;
- The threatened species recorded during the targeted surveys were threatened microchiropteran and megachiropteran bats species, being *Pteropus poliocephalus* (Grey-headed Flying-fox), *Saccolaimus flaviventris (*Yellow-bellied Sheathtail-bat), *Mormopterus norfolkensis* (East-coast Freetail-bat), *Miniopterus australis* (Little Bentwing bat) and *Miniopterus schreibersii oceanensis* (Eastern Bentwing bat)
- No threatened frog, waterbird, arboreal mammal, or fish species were identified during surveys and are considered unlikely to occur on the investigation area;
- The investigation area supported a farm dam which provided an area of open, deep water for common waterbird species;
- The investigation area had been regularly slashed and managed such that there was a paucity of leaf litter and fallen timber across the site and was likely to provide some foraging habitat for only common bird species such as the Common Myna, Magpie Lark, Eastern Rosella, Common Starling etc;
- The investigation area supported a relatively high number of hollow bearing trees; and
- The investigation area was bound by a number of significant barriers to fauna movement.

The woodland vegetation in the southern parcel of land on the GWS site has been assessed in detail by a number of ecological consultancies over a period of eight years. The overall conclusion drawn from these previous studies and the more recent work by EPS has determined that this site provides only limited suitable habitat requirements for threatened flora and fauna species due to historical and ongoing disturbance. The site does support partial habitat requirements for a number of common native and exotic flora and fauna species. The habitat characteristic of most value within the area to be impact by the project is the occurrence of numerous hollow-bearing trees. These are considered likely to provide suitable roosting habitat for the recorded threatened bat species and as such nest boxes are proposed to offset the impacts to these species.

The detailed considerations of vegetation within the subject site by SLR have determined that some of the woodland vegetation in these areas would constitute an example of the CPW community – as listed both at State and Federal level.

In regards to the potential future development opportunities on the site and the potential removal of CPW vegetation within the GWS, these activities would not have a direct significant impact that is likely to:

- Result in an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction; or

- Substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

A biodiversity offset is proposed to provide compensation for the impacts to the Cumberland Plain Woodland.

Further consultation and liaison with the Department of Planning & Environment and the Office of Environment and Heritage is required to determine the best pathway for providing the best possible ecological outcomes whilst still enabling the State Significant Development – Recycling Facility and separate rezoning process to proceed.

An EPBC Referral will be required to be submitted to the Commonwealth DoE to enable impacts to Matters of National Environmental Significance (particularly Cumberland Plain Woodland) to be considered at a Federal level.

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Appendix 1

Raw Data from the BioNet Atlas of NSW Wildlife Website

Campbelltown LGA

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions.

Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded to 0.01°).

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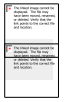
Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) or Commonwealth listed Entities in CAMPBELLTOWN LGA returned a total of 1,708 records of 204 species.

Report generated on 10/02/2014 11:48 AM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3042	*Heleioporus australiacus*		Giant Burrowing Frog	V,P	V	21	
Animalia	Amphibia	Myobatrachidae	3073	*^Mixophyes balbus*		Stuttering Frog	E1,P,2	V	P	
Animalia	Amphibia	Myobatrachidae	3116	*Pseudophryne australis*		Red-crowned Toadlet	V,P		21	
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P	V	K	
Animalia	Amphibia	Hylidae	3039	*Litoria littlejohni*		Littlejohn's Tree Frog	V,P	V	K	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	P	
Animalia	Reptilia	Dermochelyidae	2013	*Dermochelys coriacea*		Leatherback Turtle	E1,P	E	P	
Animalia	Reptilia	Varanidae	2287	*Varanus rosenbergi*		Rosenberg's Goanna	V,P		4	
Animalia	Reptilia	Elapidae	2676	*^Hoplocephalus bungaroides*		Broad-headed Snake	E1,P,2	V	7	
Animalia	Aves	Anatidae	0214	*Stictonetta naevosa*		Freckled Duck	V,P		K	
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P		K	

Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1,P		1	
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	K	
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*	Black Bittern	V,P		K	
Animalia	Aves	Accipitridae	0218	*Circus assimilis*	Spotted Harrier	V,P		1	
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		10	
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*	Square-tailed Kite	V,P,3		K	
Animalia	Aves	Accipitridae	8739	*^^Pandion cristatus*	Eastern Osprey	V,P,3		K	
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*	Bush Stone-curlew	E1,P		1	
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*	Beach Stone-curlew	E4A,P		K	
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P		K	
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P		K	
Animalia	Aves	Jacanidae	0171	*Irediparra gallinacea*	Comb-crested Jacana	V,P		K	
Animalia	Aves	Rostratulidae	0170	*Rostratula australis*	Australian Painted Snipe	E1,P	E	K	
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*	Curlew Sandpiper	E1,P	C,J,K	K	
Animalia	Aves	Scolopacidae	0167	*Limicola falcinellus*	Broad-billed Sandpiper	V,P	C,J,K	K	
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*	Black-tailed Godwit	V,P	C,J,K	K	
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P	C,J,K	K	
Animalia	Aves	Cacatuidae	0268	*^^Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3		8	
Animalia	Aves	Cacatuidae	0265	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2		4	
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*	Little Lorikeet	V,P		14	

Animalia	Aves	Psittacidae	0309	^^*Lathamus discolor*	Swift Parrot	E1,P,3	E	2	
Animalia	Aves	Psittacidae	0302	^^*Neophema pulchella*	Turquoise Parrot	V,P,3		K	
Animalia	Aves	Psittacidae	8913	^^*Pezoporus wallicus wallicus*	Eastern Ground Parrot	V,P,3		K	
Animalia	Aves	Strigidae	0246	^^*Ninox connivens*	Barking Owl	V,P,3		K	
Animalia	Aves	Strigidae	0248	^^*Ninox strenua*	Powerful Owl	V,P,3		9	
Animalia	Aves	Tytonidae	0250	^^*Tyto novaehollandiae*	Masked Owl	V,P,3		K	
Animalia	Aves	Tytonidae	9924	^^*Tyto tenebricosa*	Sooty Owl	V,P,3		K	
Animalia	Aves	Climacteridae	8127	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P		5	
Animalia	Aves	Dasyornithidae	0519	*Dasyornis brachypterus*	Eastern Bristlebird	E1,P	E	P	
Animalia	Aves	Acanthizidae	0504	*Chthonicola sagittata*	Speckled Warbler	V,P		K	
Animalia	Aves	Meliphagidae	0603	*Anthochaera phrygia*	Regent Honeyeater	E4A,P	E	2	
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P		K	
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat	V,P		P	
Animalia	Aves	Meliphagidae	0598	*Grantiella picta*	Painted Honeyeater	V,P		K	
Animalia	Aves	Meliphagidae	8303	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		3	

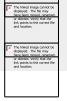
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P		50	
Animalia	Aves	Petroicidae	8367	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V,P		K	
Animalia	Aves	Petroicidae	0380	*Petroica boodang*	Scarlet Robin	V,P		8	
Animalia	Aves	Petroicidae	0382	*Petroica phoenicea*	Flame Robin	V,P		K	
Animalia	Aves	Estrildidae	0652	*Stagonopleura guttata*	Diamond Firetail	V,P		K	
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	5	
Animalia	Mammalia	Peramelidae	1710	*Isoodon obesulus obesulus*	Southern Brown Bandicoot (eastern)	E1,P	E	K	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	V,P	V	959	
Animalia	Mammalia	Burramyidae	1150	*Cercartetus nanus*	Eastern Pygmy-possum	V,P		6	
Animalia	Mammalia	Petauridae	1136	*Petaurus australis*	Yellow-bellied Glider	V,P		3	
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P		3	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	22	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		2	
Animalia	Mammalia	Molossidae	1329	*Mormopterus norfolkensis*	Eastern Freetail-bat	V,P		7	
Animalia	Mammalia	Vespertilionidae	1353	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	V	4	
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P		5	

Animalia	Mammalia	Vespertilionidae	1369	*Kerivoula papuensis*	Golden-tipped Bat	V,P		K	
Animalia	Mammalia	Vespertilionidae	1346	*Miniopterus australis*	Little Bentwing-bat	V,P		K	
Animalia	Mammalia	Vespertilionidae	1834	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V,P		17	
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P		299	
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		15	
Animalia	Mammalia	Muridae	1455	*Pseudomys novaehollandiae*	New Holland Mouse	P	V	K	
Animalia	Insecta	Chrysomelidae	I008	*Menippus darcyi*	Menippus darcyi population in the Sutherland Shire	E2		K	
Animalia	Gastropoda	Camaenidae	I006	*Meridolum corneovirens*	Cumberland Plain Land Snail	E1		40	
Plantae	Flora	Anthericaceae	7501	*Caesia parviflora var. minor*	Small Pale Grass-lily	E1,P		K	
Plantae	Flora	Apocynaceae	1226	*Cynanchum elegans*	White-flowered Wax Plant	E1,P	E	1	
Plantae	Flora	Apocynaceae	10896	*Marsdenia viridiflora subsp. viridiflora*	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	E2		K	

Plantae	Flora	Araliaceae	1200	*Astrotricha crassifolia*	Thick-leaf Star-hair	V,P	V	1	
Plantae	Flora	Casuarinaceae	8320	*Allocasuarina glareicola*		E1,P	E	K	
Plantae	Flora	Convolvulaceae	2234	*Wilsonia backhousei*	Narrow-leafed Wilsonia	V,P		K	
Plantae	Flora	Convolvulaceae	2235	*Wilsonia rotundifolia*	Round-leafed Wilsonia	E1,P		K	
Plantae	Flora	Cupressaceae	2279	*Callitris endlicheri*	Black Cypress Pine, Woronora Plateau population	E2		K	
Plantae	Flora	Dilleniaceae	11422	*Hibbertia puberula*		E1,P		K	
Plantae	Flora	Dilleniaceae	13902	*Hibbertia sp. Bankstown*		E4A,P	CE	K	
Plantae	Flora	Dilleniaceae	14564	*Hibbertia stricta subsp. furcatula*		E1,P		K	
Plantae	Flora	Dilleniaceae	11250	*Hibbertia superans*		E1,P		K	
Plantae	Flora	Elaeocarpaceae	6205	*Tetratheca glandulosa*		V,P		K	
Plantae	Flora	Ericaceae	7752	*Epacris purpurascens var. purpurascens*		V,P		K	
Plantae	Flora	Ericaceae	2618	*Leucopogon exolasius*	Woronora Beard-heath	V,P	V	13	
Plantae	Flora	Ericaceae	9569	*Leucopogon fletcheri subsp. fletcheri*		E1,P		K	
Plantae	Flora	Euphorbiaceae	9851	*Chamaesyce psammogeton*	Sand Spurge	E1,P		P	

Plantae	Flora	Fabaceae (Faboideae)	2853	*Dillwynia tenuifolia*		V,P		K	
Plantae	Flora	Fabaceae (Faboideae)	2974	*Pultenaea aristata*	Prickly Bush-pea	V,P	V	40	
Plantae	Flora	Fabaceae (Faboideae)	3007	*Pultenaea parviflora*		E1,P	V	K	
Plantae	Flora	Fabaceae (Faboideae)	3008	*Pultenaea pedunculata*	Matted Bush-pea	E1,P		9	
Plantae	Flora	Fabaceae (Mimosoideae)	6577	*Acacia baueri subsp. aspera*		V,P		K	
Plantae	Flora	Fabaceae (Mimosoideae)	3728	*Acacia bynoeana*	Bynoe's Wattle	E1,P	V	1	
Plantae	Flora	Fabaceae (Mimosoideae)	7229	*Acacia gordonii*		E1,P	E	K	
Plantae	Flora	Fabaceae (Mimosoideae)	3860	*Acacia pubescens*	Downy Wattle	V,P	V	3	
Plantae	Flora	Grammitidaceae	9471	*^^Grammitis stenophylla*	Narrow-leaf Finger Fern	E1,P,3		K	
Plantae	Flora	Gyrostemonaceae	9411	*^^Gyrostemon thesioides*		E1,P,3		15	
Plantae	Flora	Haloragaceae	9512	*Haloragis exalata subsp. exalata*	Square Raspwort	V,P	V	K	
Plantae	Flora	Haloragaceae	3257	*Haloragodendron lucasii*		E1,P	E	K	
Fungi	Flora	Hygrophoraceae	F006	*Camarophyllopsis kearneyi*		E1,P		K	

Fungi	Flora	Hygrophoraceae	F003	*Hygrocybe anomala var. ianthinomarginata*		V,P		K	
Fungi	Flora	Hygrophoraceae	F004	*Hygrocybe aurantipes*		V,P		K	
Fungi	Flora	Hygrophoraceae	F001	*Hygrocybe austropratensis*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F007	*Hygrocybe collucera*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F008	*Hygrocybe griseoramosa*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F005	*Hygrocybe lanecovensis*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F002	*Hygrocybe reesiae*		V,P		K	
Fungi	Flora	Hygrophoraceae	F015	*Hygrocybe rubronivea*		V,P		K	
Plantae	Flora	Juncaginaceae	3363	*Maundia triglochinoides*		V,P		K	
Plantae	Flora	Lamiaceae	3404	*Prostanthera densa*	Villous Mint-bush	V,P	V	K	
Plantae	Flora	Lobeliaceae	1911	*^^Hypsela sessiliflora*		E1,P,3	X	K	
Plantae	Flora	Marsileaceae	8140	*^^Pilularia novae-hollandiae*	Austral Pillwort	E1,P,3		K	
Plantae	Flora	Myrtaceae	4007	*^^Callistemon linearifolius*	Netted Bottle Brush	V,P,3		2	
Plantae	Flora	Myrtaceae	4024	*Darwinia biflora*		V,P	V	K	
Plantae	Flora	Myrtaceae	4031	*Darwinia*		V,P		K	

				peduncularis					
Plantae	Flora	Myrtaceae	4055	*Eucalyptus benthamii*	Camden White Gum	V,P	V	K	
Plantae	Flora	Myrtaceae	4067	*Eucalyptus camfieldii*	Camfield's Stringybark	V,P	V	K	
Plantae	Flora	Myrtaceae	11892	*Eucalyptus sp. Cattai*		E1,P		P	
Plantae	Flora	Myrtaceae	6809	*Melaleuca biconvexa*	Biconvex Paperbark	V,P	V	K	
Plantae	Flora	Myrtaceae	4248	*Melaleuca deanei*	Deane's Paperbark	V,P	V	17	
Plantae	Flora	Myrtaceae	4274	*Micromyrtus minutiflora*		E1,P	V	K	
Plantae	Flora	Myrtaceae	4293	*Syzygium paniculatum*	Magenta Lilly Pilly	E1,P	V	K	
Plantae	Flora	Orchidaceae	4386	*^Caladenia tessellata*	Thick Lip Spider Orchid	E1,P, 2	V	K	
Plantae	Flora	Orchidaceae	4464	*^Genoplesium baueri*	Bauer's Midge Orchid	E1,P, 2		1	
Plantae	Flora	Orchidaceae	9615	*^Pterostylis saxicola*	Sydney Plains Greenhood	E1,P, 2	E	5	
Plantae	Flora	Poaceae	4875	*Deyeuxia appressa*		E1,P	E	P	
Plantae	Flora	Polygonaceae	5280	*Persicaria elatior*	Tall Knotweed	V,P	V	K	
Plantae	Flora	Proteaceae	10917	*Grevillea juniperina subsp. juniperina*	Juniper-leaved Grevillea	V,P		K	
Plantae	Flora	Proteaceae	10009	*Grevillea parviflora subsp. parviflora*	Small-flower Grevillea	V,P	V	15	
Plantae	Flora	Proteaceae	10777	*Grevillea parviflora subsp. supplicans*		E1,P		K	
Plantae	Flora	Proteaceae	9527	*Persoonia bargoensis*	Bargo Geebung	E1,P	V	K	
Plantae	Flora	Proteaceae	7677	*Persoonia glaucescens*	Mittagong Geebung	E1,P	V	K	
Plantae	Flora	Proteaceae	5458	*^^Persoonia hirsuta*	Hairy Geebung	E1,P, 3	E	7	

Plantae	Flora	Proteaceae	8995	*Persoonia mollis subsp. maxima*		E1,P	E	K	
Plantae	Flora	Proteaceae	5467	*Persoonia nutans*	Nodding Geebung	E1,P	E	8	
Plantae	Flora	Rhamnaceae	5573	*Pomaderris brunnea*	Brown Pomaderris	V,P	V	2	
Plantae	Flora	Rubiaceae	5680	*Galium australe*	Tangled Bedstraw	E1,P		K	
Plantae	Flora	Rutaceae	5840	*Zieria involucrata*		E1,P	V	K	
Plantae	Flora	Santalaceae	5871	*Thesium australe*	Austral Toadflax	V,P	V	K	
Plantae	Flora	Sterculiaceae	6140	*Lasiopetalum joyceae*		V,P	V	K	
Plantae	Flora	Sterculiaceae	6148	*Rulingia prostrata*	Dwarf Kerrawang	E1,P	E	P	
Plantae	Flora	Thymelaeaceae	6965	*Pimelea curviflora var. curviflora*		V,P	V	K	
Plantae	Flora	Thymelaeaceae	6190	*Pimelea spicata*	Spiked Rice-flower	E1,P	E	10	
Plantae	Flora	Zannichelliaceae	6339	*Zannichellia palustris*		E1,P		K	
Community				*Agnes Banks Woodland in the Sydney Basin Bioregion*	Agnes Banks Woodland in the Sydney Basin Bioregion	E3		K	
Community				*Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions*	Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions	E3		K	
Community				*Blue Gum High Forest in the Sydney Basin Bioregion*	Blue Gum High Forest in the Sydney Basin Bioregion	E4B	CE	K	

Community	*Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion*	Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	E3	CE	K	
Community	*Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion*	Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V2		K	
Community	*Castlereagh Swamp Woodland Community*	Castlereagh Swamp Woodland Community	E3		K	
Community	*Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	V	P	
Community	*Coastal Upland Swamp in the Sydney Basin Bioregion*	Coastal Upland Swamp in the Sydney Basin Bioregion	E3		K	
Community	*Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion*	Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E3		K	
Community	*Cumberland Plain Woodland in the Sydney Basin Bioregion*	Cumberland Plain Woodland in the Sydney Basin Bioregion	E4B	CE	K	
Community	*Elderslie Banksia Scrub Forest*	Elderslie Banksia Scrub Forest	E3		K	

Community	*Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Kurnell Dune Forest in the Sutherland Shire and City of Rockdale*	Kurnell Dune Forest in the Sutherland Shire and City of Rockdale	E3		K	
Community	*Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	CE	P	
Community	*Moist Shale Woodland in the Sydney Basin Bioregion*	Moist Shale Woodland in the Sydney Basin Bioregion	E3	CE	K	
Community	*O'Hares Creek Shale Forest*	O'Hares Creek Shale Forest	E3		K	
Community	*River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	

Community	*Shale gravel Transition Forest in the Sydney Basin Bioregion*	Shale gravel Transition Forest in the Sydney Basin Bioregion	E3	CE	K	
Community	*Shale/Sandstone Transition Forest*	Shale/Sandstone Transition Forest	E3	E	K	
Community	*Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion*	Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	E3		K	
Community	*Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Sydney Freshwater Wetlands in the Sydney Basin Bioregion*	Sydney Freshwater Wetlands in the Sydney Basin Bioregion	E3		K	
Community	*Sydney Turpentine-Ironbark Forest*	Sydney Turpentine-Ironbark Forest	E3	CE	K	

Community	*Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions*	Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Western Sydney Dry Rainforest in the Sydney Basin Bioregion*	Western Sydney Dry Rainforest in the Sydney Basin Bioregion	E3	CE	K	
Threat	*Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala*	Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala	KTP		P	
Threat	*Alteration of habitat following subsidence due to longwall mining*	Alteration of habitat following subsidence due to longwall mining	KTP		P	
Threat	*Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands*	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP		P	
Threat	*Anthropogenic Climate Change*	Anthropogenic Climate Change	KTP	KTP	P	
Threat	*Bushrock removal*	Bushrock removal	KTP		P	

Threat	*Clearing of native vegetation*	Clearing of native vegetation	KTP	KTP	P	
Threat	*Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)*	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	KTP	KTP	P	
Threat	*Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758*	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	KTP	KTP	P	
Threat	*Competition from feral honey bees, Apis mellifera L.*	Competition from feral honey bees, Apis mellifera L.	KTP		P	
Threat	*Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners*	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP		P	
Threat	*Herbivory and environmental degradation caused by feral deer*	Herbivory and environmental degradation caused by feral deer	KTP		P	

Threat	*High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP		P	
Threat	*Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972*	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	KTP	KTP	P	
Threat	*Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations*	Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP	KTP	P	
Threat	*Infection of frogs by amphibian chytrid causing the disease chytridiomycosis*	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP	P	
Threat	*Infection of native plants by Phytophthora cinnamomi*	Infection of native plants by Phytophthora cinnamomi	KTP	KTP	P	
Threat	*Introduction of the Large Earth Bumblebee Bombus terrestris (L.)*	Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	KTP		P	

Threat	*Invasion and establishment of exotic vines and scramblers*	Invasion and establishment of exotic vines and scramblers	KTP		P	
Threat	*Invasion and establishment of Scotch Broom (Cytisus scoparius)*	Invasion and establishment of Scotch Broom (Cytisus scoparius)	KTP		P	
Threat	*Invasion and establishment of the Cane Toad (Bufo marinus)*	Invasion and establishment of the Cane Toad (Bufo marinus)	KTP	KTP	P	
Threat	*Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.*	Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	KTP		P	
Threat	*Invasion of native plant communities by Chrysanthemoides monilifera*	Invasion of native plant communities by Chrysanthemoides monilifera	KTP		P	
Threat	*Invasion of native plant communities by exotic perennial grasses*	Invasion of native plant communities by exotic perennial grasses	KTP		P	
Threat	*Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW*	Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	KTP		P	

Threat	*Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)*	Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	KTP		P	
Threat	*Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants*	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP	P	
Threat	*Loss of Hollow-bearing Trees*	Loss of Hollow-bearing Trees	KTP		P	
Threat	*Loss or degradation (or both) of sites used for hill-topping by butterflies*	Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP		P	
Threat	*Predation and hybridisation by Feral Dogs, Canis lupus familiaris*	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	KTP		P	
Threat	*Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)*	Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP		P	

Threat	*Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)*	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	KTP	KTP	P	
Threat	*Predation by the Feral Cat Felis catus (Linnaeus, 1758)*	Predation by the Feral Cat Felis catus (Linnaeus, 1758)	KTP	KTP	P	
Threat	*Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758*	Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	KTP	KTP	P	
Threat	*Removal of dead wood and dead trees*	Removal of dead wood and dead trees	KTP		P	

Raw Data from the BioNet Atlas of NSW Wildlife Website
Liverpool LGA

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions.

Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded to 0.01°).

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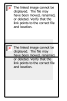
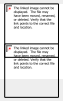
Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) or Commonwealth listed Entities in LIVERPOOL LGA returned a total of 836 records of 211 species.

Report generated on 10/02/2014 11:51 AM

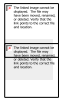
Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3042	*Heleioporus australiacus*		Giant Burrowing Frog	V,P	V	4	
Animalia	Amphibia	Myobatrachidae	3073	*^Mixophyes balbus*		Stuttering Frog	E1,P,2	V	P	
Animalia	Amphibia	Myobatrachidae	3116	*Pseudophryne australis*		Red-crowned Toadlet	V,P		6	
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P	V	14	
Animalia	Amphibia	Hylidae	3039	*Litoria littlejohni*		Littlejohn's Tree Frog	V,P	V	K	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	P	
Animalia	Reptilia	Dermochelyidae	2013	*Dermochelys coriacea*		Leatherback Turtle	E1,P	E	P	
Animalia	Reptilia	Varanidae	2287	*Varanus rosenbergi*		Rosenberg's Goanna	V,P		K	
Animalia	Reptilia	Elapidae	2676	*^Hoplocephalus bungaroides*		Broad-headed Snake	E1,P,2	V	K	
Animalia	Aves	Anatidae	0214	*Stictonetta naevosa*		Freckled Duck	V,P		K	
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P		K	

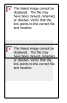
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1,P		K
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	K
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*	Black Bittern	V,P		K
Animalia	Aves	Accipitridae	0218	*Circus assimilis*	Spotted Harrier	V,P		1
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		13
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*	Square-tailed Kite	V,P,3		2
Animalia	Aves	Accipitridae	8739	*^^Pandion cristatus*	Eastern Osprey	V,P,3		K
Animalia	Aves	Falconidae	0238	*Falco subniger*	Black Falcon	V,P		2
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*	Bush Stone-curlew	E1,P		2
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*	Beach Stone-curlew	E4A,P		K
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P		K
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P		K
Animalia	Aves	Jacanidae	0171	*Irediparra gallinacea*	Comb-crested Jacana	V,P		K
Animalia	Aves	Rostratulidae	0170	*Rostratula australis*	Australian Painted Snipe	E1,P	E	K
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*	Curlew Sandpiper	E1,P	C,J,K	K
Animalia	Aves	Scolopacidae	0167	*Limicola falcinellus*	Broad-billed Sandpiper	V,P	C,J,K	K
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*	Black-tailed Godwit	V,P	C,J,K	K
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P	C,J,K	K
Animalia	Aves	Cacatuidae	0268	*^^Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3		2
Animalia	Aves	Cacatuidae	0265	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2		11
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*	Little Lorikeet	V,P		8

Animalia	Aves	Psittacidae	0309	^^*Lathamus discolor*	Swift Parrot	E1,P,3	E	7	
Animalia	Aves	Psittacidae	0302	^^*Neophema pulchella*	Turquoise Parrot	V,P,3		K	
Animalia	Aves	Psittacidae	8913	^^*Pezoporus wallicus wallicus*	Eastern Ground Parrot	V,P,3		K	
Animalia	Aves	Strigidae	0246	^^*Ninox connivens*	Barking Owl	V,P,3		1	
Animalia	Aves	Strigidae	0248	^^*Ninox strenua*	Powerful Owl	V,P,3		17	
Animalia	Aves	Tytonidae	0250	^^*Tyto novaehollandiae*	Masked Owl	V,P,3		K	
Animalia	Aves	Tytonidae	9924	^^*Tyto tenebricosa*	Sooty Owl	V,P,3		K	
Animalia	Aves	Climacteridae	8127	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P		K	
Animalia	Aves	Dasyornithidae	0519	*Dasyornis brachypterus*	Eastern Bristlebird	E1,P	E	P	
Animalia	Aves	Acanthizidae	0504	*Chthonicola sagittata*	Speckled Warbler	V,P		6	
Animalia	Aves	Meliphagidae	0603	*Anthochaera phrygia*	Regent Honeyeater	E4A,P	E	6	
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P		1	
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat	V,P		1	
Animalia	Aves	Meliphagidae	0598	*Grantiella picta*	Painted Honeyeater	V,P		K	

Animalia	Aves	Meliphagidae	8303	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		4	
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P		22	
Animalia	Aves	Petroicidae	8367	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V,P		2	
Animalia	Aves	Petroicidae	0380	*Petroica boodang*	Scarlet Robin	V,P		4	
Animalia	Aves	Petroicidae	0382	*Petroica phoenicea*	Flame Robin	V,P		3	
Animalia	Aves	Estrildidae	0652	*Stagonopleura guttata*	Diamond Firetail	V,P		K	
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	2	
Animalia	Mammalia	Peramelidae	1710	*Isoodon obesulus obesulus*	Southern Brown Bandicoot (eastern)	E1,P	E	K	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	V,P	V	26	
Animalia	Mammalia	Burramyidae	1150	*Cercartetus nanus*	Eastern Pygmy-possum	V,P		1	
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P		1	
Animalia	Mammalia	Macropodidae	1215	*Petrogale penicillata*	Brush-tailed Rock-wallaby	E1,P	V	1	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	55	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		3	
Animalia	Mammalia	Molossidae	1329	*Mormopterus norfolkensis*	Eastern Freetail-bat	V,P		30	

Animalia	Mammalia	Vespertilionidae	1353	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	V	4	
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P		5	
Animalia	Mammalia	Vespertilionidae	1369	*Kerivoula papuensis*	Golden-tipped Bat	V,P		K	
Animalia	Mammalia	Vespertilionidae	1346	*Miniopterus australis*	Little Bentwing-bat	V,P		K	
Animalia	Mammalia	Vespertilionidae	1834	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V,P		22	
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P		12	
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		14	
Animalia	Mammalia	Muridae	1455	*Pseudomys novaehollandiae*	New Holland Mouse	P	V	K	
Animalia	Insecta	Chrysomelidae	I008	*Menippus darcyi*	Menippus darcyi population in the Sutherland Shire	E2		K	
Animalia	Gastropoda	Camaenidae	I006	*Meridolum corneovirens*	Cumberland Plain Land Snail	E1		233	
Plantae	Flora	Anthericaceae	7501	*Caesia parviflora var. minor*	Small Pale Grass-lily	E1,P		K	
Plantae	Flora	Apocynaceae	1226	*Cynanchum elegans*	White-flowered Wax Plant	E1,P	E	K	

Plantae	Flora	Apocynaceae	10896	*Marsdenia viridiflora subsp. viridiflora*	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	E2		6	
Plantae	Flora	Araliaceae	1200	*Astrotricha crassifolia*	Thick-leaf Star-hair	V,P	V	K	
Plantae	Flora	Campanulaceae	1937	*Wahlenbergia multicaulis*	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2		K	
Plantae	Flora	Casuarinaceae	8320	*Allocasuarina glareicola*		E1,P	E	1	
Plantae	Flora	Convolvulaceae	2234	*Wilsonia backhousei*	Narrow-leafed Wilsonia	V,P		K	
Plantae	Flora	Convolvulaceae	2235	*Wilsonia rotundifolia*	Round-leafed Wilsonia	E1,P		K	
Plantae	Flora	Dilleniaceae	11422	*Hibbertia puberula*		E1,P		K	
Plantae	Flora	Dilleniaceae	13902	*Hibbertia sp. Bankstown*		E4A,P	CE	K	
Plantae	Flora	Dilleniaceae	14564	*Hibbertia stricta subsp. furcatula*		E1,P		K	
Plantae	Flora	Dilleniaceae	11250	*Hibbertia superans*		E1,P		K	

Plantae	Flora	Elaeocarpaceae	6205	*Tetratheca glandulosa*		V,P		K	
Plantae	Flora	Ericaceae	7752	*Epacris purpurascens var. purpurascens*		V,P		K	
Plantae	Flora	Ericaceae	2618	*Leucopogon exolasius*	Woronora Beard-heath	V,P	V	3	
Plantae	Flora	Ericaceae	9569	*Leucopogon fletcheri subsp. fletcheri*		E1,P		1	
Plantae	Flora	Euphorbiaceae	9851	*Chamaesyce psammogeton*	Sand Spurge	E1,P		P	
Plantae	Flora	Fabaceae (Faboideae)	2853	*Dillwynia tenuifolia*	Dillwynia tenuifolia, Kemps Creek	E2,V,P		18	
Plantae	Flora	Fabaceae (Faboideae)	2853	*Dillwynia tenuifolia*		V,P		25	
Plantae	Flora	Fabaceae (Faboideae)	2974	*Pultenaea aristata*	Prickly Bush-pea	V,P	V	K	
Plantae	Flora	Fabaceae (Faboideae)	3007	*Pultenaea parviflora*		E1,P	V	85	
Plantae	Flora	Fabaceae (Faboideae)	3008	*Pultenaea pedunculata*	Matted Bush-pea	E1,P		12	
Plantae	Flora	Fabaceae (Mimosoideae)	6577	*Acacia baueri subsp. aspera*		V,P		K	
Plantae	Flora	Fabaceae (Mimosoideae)	3728	*Acacia bynoeana*	Bynoe's Wattle	E1,P	V	K	
Plantae	Flora	Fabaceae (Mimosoideae)	7229	*Acacia gordonii*		E1,P	E	K	

Plantae	Flora	Fabaceae (Mimosoideae)	3860	*Acacia pubescens*	Downy Wattle	V,P	V	53	
Plantae	Flora	Grammitidaceae	9471	*^^Grammitis stenophylla*	Narrow-leaf Finger Fern	E1,P,3		K	
Plantae	Flora	Gyrostemonaceae	9411	*^^Gyrostemon thesioides*		E1,P,3		16	
Plantae	Flora	Haloragaceae	9512	*Haloragis exalata subsp. exalata*	Square Raspwort	V,P	V	K	
Plantae	Flora	Haloragaceae	3257	*Haloragodendron lucasii*		E1,P	E	K	
Fungi	Flora	Hygrophoraceae	F006	*Camarophyllopsis kearneyi*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F003	*Hygrocybe anomala var. ianthinomarginata*		V,P		K	
Fungi	Flora	Hygrophoraceae	F004	*Hygrocybe aurantipes*		V,P		K	
Fungi	Flora	Hygrophoraceae	F001	*Hygrocybe austropratensis*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F007	*Hygrocybe collucera*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F008	*Hygrocybe griseoramosa*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F005	*Hygrocybe lanecovensis*		E1,P		K	
Fungi	Flora	Hygrophoraceae	F002	*Hygrocybe reesiae*		V,P		K	
Fungi	Flora	Hygrophoraceae	F015	*Hygrocybe rubronivea*		V,P		K	

Plantae	Flora	Juncaginaceae	3363	*Maundia triglochinoides*		V,P		K	
Plantae	Flora	Lamiaceae	3404	*Prostanthera densa*	Villous Mint-bush	V,P	V	K	
Plantae	Flora	Lobeliaceae	1911	*^^Hypsela sessiliflora*		E1,P,3	X	K	
Plantae	Flora	Marsileaceae	8140	*^^Pilularia novae-hollandiae*	Austral Pillwort	E1,P,3		K	
Plantae	Flora	Myrtaceae	4007	*^^Callistemon linearifolius*	Netted Bottle Brush	V,P,3		3	
Plantae	Flora	Myrtaceae	4024	*Darwinia biflora*		V,P	V	K	
Plantae	Flora	Myrtaceae	4031	*Darwinia peduncularis*		V,P		K	
Plantae	Flora	Myrtaceae	4055	*Eucalyptus benthamii*	Camden White Gum	V,P	V	5	
Plantae	Flora	Myrtaceae	4067	*Eucalyptus camfieldii*	Camfield's Stringybark	V,P	V	K	
Plantae	Flora	Myrtaceae	4134	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	V,P	V	1	
Plantae	Flora	Myrtaceae	8907	*Eucalyptus scoparia*	Wallangarra White Gum	E1,P	V	1	
Plantae	Flora	Myrtaceae	11892	*Eucalyptus sp. Cattai*		E1,P		P	
Plantae	Flora	Myrtaceae	6809	*Melaleuca biconvexa*	Biconvex Paperbark	V,P	V	K	
Plantae	Flora	Myrtaceae	4248	*Melaleuca deanei*	Deane's Paperbark	V,P	V	9	
Plantae	Flora	Myrtaceae	4274	*Micromyrtus minutiflora*		E1,P	V	K	
Plantae	Flora	Myrtaceae	4293	*Syzygium paniculatum*	Magenta Lilly Pilly	E1,P	V	K	
Plantae	Flora	Orchidaceae	4386	*^Caladenia tessellata*	Thick Lip Spider Orchid	E1,P,2	V	K	
Plantae	Flora	Orchidaceae	4439	*^Diuris aequalis*	Buttercup Doubletail	E1,P,2	V	1	

Plantae	Flora	Orchidaceae	4464	^*Genoplesium baueri*	Bauer's Midge Orchid	E1,P,2		K	
Plantae	Flora	Orchidaceae	7324	^*Pterostylis nigricans*	Dark Greenhood	V,P,2		1	
Plantae	Flora	Orchidaceae	9615	^*Pterostylis saxicola*	Sydney Plains Greenhood	E1,P,2	E	2	
Plantae	Flora	Poaceae	4875	*Deyeuxia appressa*		E1,P	E	P	
Plantae	Flora	Polygonaceae	5280	*Persicaria elatior*	Tall Knotweed	V,P	V	K	
Plantae	Flora	Proteaceae	10917	*Grevillea juniperina subsp. juniperina*	Juniper-leaved Grevillea	V,P		1	
Plantae	Flora	Proteaceae	10009	*Grevillea parviflora subsp. parviflora*	Small-flower Grevillea	V,P	V	15	
Plantae	Flora	Proteaceae	10777	*Grevillea parviflora subsp. supplicans*		E1,P		K	
Plantae	Flora	Proteaceae	9527	*Persoonia bargoensis*	Bargo Geebung	E1,P	V	K	
Plantae	Flora	Proteaceae	7677	*Persoonia glaucescens*	Mittagong Geebung	E1,P	V	K	
Plantae	Flora	Proteaceae	5458	^^*Persoonia hirsuta*	Hairy Geebung	E1,P,3	E	1	
Plantae	Flora	Proteaceae	8995	*Persoonia mollis subsp. maxima*		E1,P	E	K	
Plantae	Flora	Proteaceae	5467	*Persoonia nutans*	Nodding Geebung	E1,P	E	19	
Plantae	Flora	Rhamnaceae	5573	*Pomaderris brunnea*	Brown Pomaderris	V,P	V	K	
Plantae	Flora	Rhamnaceae	5591	*Pomaderris prunifolia*	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2		K	
Plantae	Flora	Rubiaceae	5680	*Galium australe*	Tangled Bedstraw	E1,P		K	

Plantae	Flora	Rutaceae	5840	*Zieria involucrata*		E1,P	V	K	
Plantae	Flora	Santalaceae	5871	*Thesium australe*	Austral Toadflax	V,P	V	K	
Plantae	Flora	Sterculiaceae	6140	*Lasiopetalum joyceae*		V,P	V	K	
Plantae	Flora	Sterculiaceae	6148	*Rulingia prostrata*	Dwarf Kerrawang	E1,P	E	P	
Plantae	Flora	Thymelaeaceae	6965	*Pimelea curviflora var. curviflora*		V,P	V	K	
Plantae	Flora	Thymelaeaceae	6190	*Pimelea spicata*	Spiked Rice-flower	E1,P	E	9	
Plantae	Flora	Zannichelliaceae	6339	*Zannichellia palustris*		E1,P		K	
Community				*Agnes Banks Woodland in the Sydney Basin Bioregion*	Agnes Banks Woodland in the Sydney Basin Bioregion	E3		K	
Community				*Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions*	Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions	E3		K	
Community				*Blue Gum High Forest in the Sydney Basin Bioregion*	Blue Gum High Forest in the Sydney Basin Bioregion	E4B	CE	K	
Community				*Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion*	Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	E3	CE	K	
Community				*Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion*	Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V2		K	

Community	*Castlereagh Swamp Woodland Community*	Castlereagh Swamp Woodland Community	E3		K	
Community	*Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	V	P	
Community	*Coastal Upland Swamp in the Sydney Basin Bioregion*	Coastal Upland Swamp in the Sydney Basin Bioregion	E3		K	
Community	*Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion*	Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E3		K	
Community	*Cumberland Plain Woodland in the Sydney Basin Bioregion*	Cumberland Plain Woodland in the Sydney Basin Bioregion	E4B	CE	K	
Community	*Elderslie Banksia Scrub Forest*	Elderslie Banksia Scrub Forest	E3		K	
Community	*Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	

Community	*Kurnell Dune Forest in the Sutherland Shire and City of Rockdale*	Kurnell Dune Forest in the Sutherland Shire and City of Rockdale	E3		K	
Community	*Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	CE	P	
Community	*Moist Shale Woodland in the Sydney Basin Bioregion*	Moist Shale Woodland in the Sydney Basin Bioregion	E3	CE	K	
Community	*O'Hares Creek Shale Forest*	O'Hares Creek Shale Forest	E3		K	
Community	*River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Shale gravel Transition Forest in the Sydney Basin Bioregion*	Shale gravel Transition Forest in the Sydney Basin Bioregion	E3	CE	K	
Community	*Shale/Sandstone Transition Forest*	Shale/Sandstone Transition Forest	E3	E	K	

Community	*Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion*	Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	E3		K	
Community	*Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Sydney Freshwater Wetlands in the Sydney Basin Bioregion*	Sydney Freshwater Wetlands in the Sydney Basin Bioregion	E3		K	
Community	*Sydney Turpentine-Ironbark Forest*	Sydney Turpentine-Ironbark Forest	E3	CE	K	

Community	*Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions*	Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Western Sydney Dry Rainforest in the Sydney Basin Bioregion*	Western Sydney Dry Rainforest in the Sydney Basin Bioregion	E3	CE	K	
Threat	*Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala*	Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala	KTP		P	
Threat	*Alteration of habitat following subsidence due to longwall mining*	Alteration of habitat following subsidence due to longwall mining	KTP		P	
Threat	*Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands*	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP		P	
Threat	*Anthropogenic Climate Change*	Anthropogenic Climate Change	KTP	KTP	P	
Threat	*Bushrock removal*	Bushrock removal	KTP		P	

Threat	*Clearing of native vegetation*	Clearing of native vegetation	KTP	KTP	P	
Threat	*Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)*	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	KTP	KTP	P	
Threat	*Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758*	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	KTP	KTP	P	
Threat	*Competition from feral honey bees, Apis mellifera L.*	Competition from feral honey bees, Apis mellifera L.	KTP		P	
Threat	*Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners*	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP		P	
Threat	*Herbivory and environmental degradation caused by feral deer*	Herbivory and environmental degradation caused by feral deer	KTP		P	

Threat	*High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP		P	
Threat	*Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972*	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	KTP	KTP	P	
Threat	*Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations*	Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP	KTP	P	
Threat	*Infection of frogs by amphibian chytrid causing the disease chytridiomycosis*	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP	P	
Threat	*Infection of native plants by Phytophthora cinnamomi*	Infection of native plants by Phytophthora cinnamomi	KTP	KTP	P	
Threat	*Introduction of the Large Earth Bumblebee Bombus terrestris (L.)*	Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	KTP		P	

Threat	*Invasion and establishment of exotic vines and scramblers*	Invasion and establishment of exotic vines and scramblers	KTP		P	
Threat	*Invasion and establishment of Scotch Broom (Cytisus scoparius)*	Invasion and establishment of Scotch Broom (Cytisus scoparius)	KTP		P	
Threat	*Invasion and establishment of the Cane Toad (Bufo marinus)*	Invasion and establishment of the Cane Toad (Bufo marinus)	KTP	KTP	P	
Threat	*Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.*	Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	KTP		P	
Threat	*Invasion of native plant communities by Chrysanthemoides monilifera*	Invasion of native plant communities by Chrysanthemoides monilifera	KTP		P	
Threat	*Invasion of native plant communities by exotic perennial grasses*	Invasion of native plant communities by exotic perennial grasses	KTP		P	
Threat	*Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW*	Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	KTP		P	

Threat	*Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)*	Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	KTP		P	
Threat	*Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants*	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP	P	
Threat	*Loss of Hollow-bearing Trees*	Loss of Hollow-bearing Trees	KTP		P	
Threat	*Loss or degradation (or both) of sites used for hill-topping by butterflies*	Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP		P	
Threat	*Predation and hybridisation by Feral Dogs, Canis lupus familiaris*	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	KTP		P	
Threat	*Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)*	Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP		P	

Threat	*Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)*	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	KTP	KTP	P	
Threat	*Predation by the Feral Cat Felis catus (Linnaeus, 1758)*	Predation by the Feral Cat Felis catus (Linnaeus, 1758)	KTP	KTP	P	
Threat	*Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758*	Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	KTP	KTP	P	
Threat	*Removal of dead wood and dead trees*	Removal of dead wood and dead trees	KTP		P	

Appendix 2

Raw Data EPBC Act Protected Matters Search Tool Results

Australian Government

Department of the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 31/01/14 09:56:18

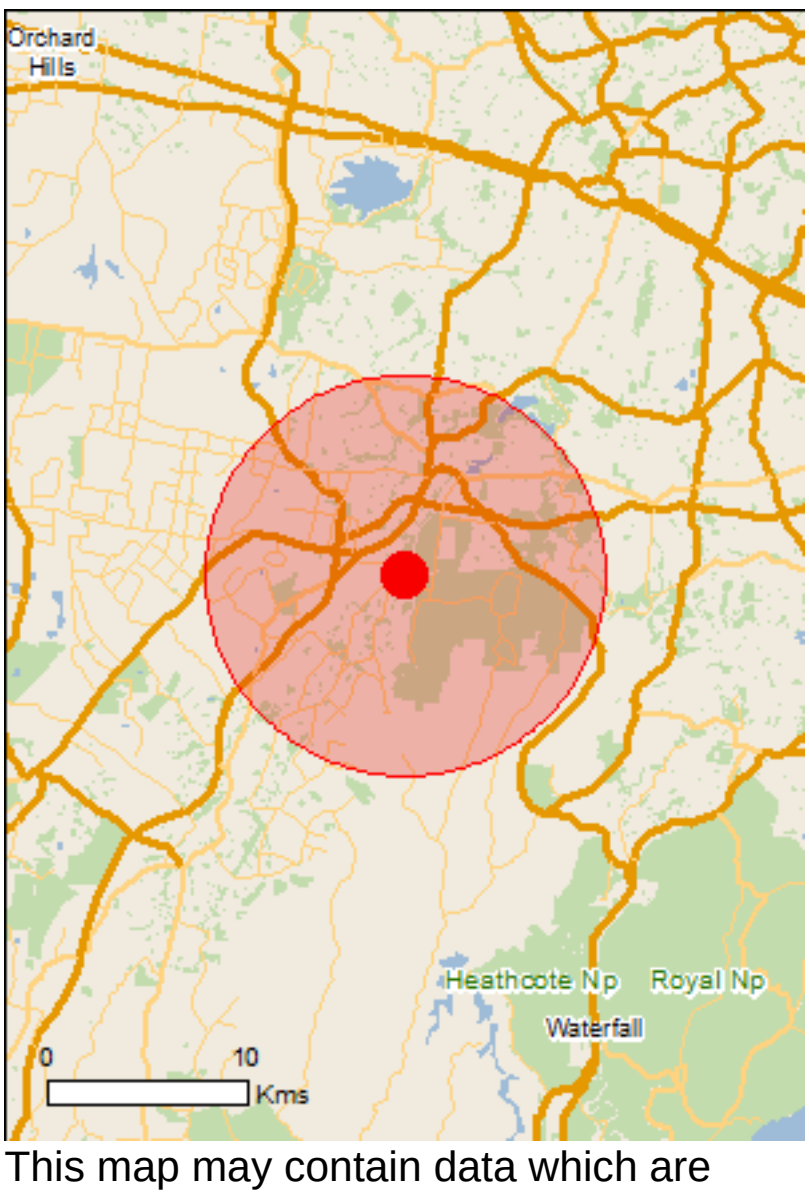
Summary

Details

- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat

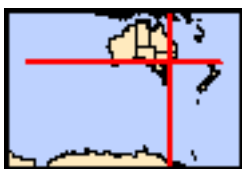
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 10.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	66
Listed Migratory Species:	34

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	17
Commonwealth Heritage Places:	3
Listed Marine Species:	34
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	27
State and Territory Reserves:	3
Regional Forest Agreements:	None
Invasive Species:	55
Nationally Important Wetlands:	2
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties [Resource Information]

Name	State	Status
Historic		
Vietnam War Comradeship Memorial	NSW	Nominated place

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area
Shale/Sandstone Transition Forest	Endangered	Community likely to occur within area
Turpentine-Ironbark Forest in the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora epomophora Southern Royal Albatross [25996]	Vulnerable	Species or species habitat likely to occur within area
Diomedea epomophora sanfordi Northern Royal Albatross [82331]	Endangered	Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Diomedea exulans antipodensis Antipodean Albatross [82269]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans exulans Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area
Diomedea exulans gibsoni Gibson's Albatross [82271]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta salvini Salvin's Albatross [82343]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris impavida Campbell Albatross [82449]	Vulnerable	Species or species habitat may occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Frogs		
Heleioporus australiacus		
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
Litoria littlejohni		
Littlejohn's Tree Frog, Heath Frog [64733]	Vulnerable	Species or species habitat may occur within area
Litoria raniformis		
Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat may occur within area
Mixophyes balbus		
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus		
Southern Brown Bandicoot (Eastern) [68050]	Endangered	Species or species habitat may occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Acacia pubescens		
Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat likely to occur within area
Allocasuarina glareicola		
[21932]	Endangered	Migration route known to occur within area
Asterolasia elegans		
[56780]	Endangered	Species or species habitat likely to occur within area
Caladenia tessellata		
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat likely to occur within area
Grevillea parviflora subsp. parviflora Small-flower Grevillea [64910]	Vulnerable	Species or species habitat likely to occur within area
Hibbertia puberula subsp. glabrescens [86645]	Critically Endangered	Species or species habitat likely to occur within area
Leucopogon exolasius Woronora Beard-heath [14251]	Vulnerable	Species or species habitat likely to occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat likely to occur within area
Pelargonium sp. Striatellum (G.W.Carr 10345) Omeo Stork's-bill [84065]	Endangered	Species or species habitat may occur within area
Persoonia hirsuta Hairy Persoonia [19006]	Endangered	Species or species habitat likely to occur within area
Persoonia nutans Nodding Geebung [18119]	Endangered	Species or species habitat likely to occur within area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat likely to occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat known to occur within area
Pomaderris brunnea Rufous Pomaderris [16845]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat known to occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat known to occur within area
Pultenaea parviflora [19380]	Vulnerable	Species or species habitat likely to occur within area
Streblus pendulinus Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Thelymitra sp. Kangaloon (D.L.Jones 18108)		
Kangaloon Sun-orchid [81971]	Critically Endangered	Species or species habitat may occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hoplocephalus bungaroides		
Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Diomedea antipodensis		
Antipodean Albatross [64458]	Vulnerable*	Species or species habitat likely to occur within area
Diomedea dabbenena		
Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto)		
Southern Royal Albatross [1072]	Vulnerable*	Species or species habitat likely to occur within area
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Vulnerable	Species or species habitat likely to occur within area
Diomedea gibsoni		
Gibson's Albatross [64466]	Vulnerable*	Species or species habitat likely to occur within area
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered*	Species or species habitat likely to occur within area
Macronectes giganteus		
Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli		
Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri		
Buller's Albatross [64460]	Vulnerable	Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat likely to occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat likely to occur within area
Migratory Marine Species		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Xanthomyza phrygia Regent Honeyeater [430]	Endangered*	Species or species habitat known to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Postal Corporation
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Australian Telecommunications Corporation
Commonwealth Land - Commonwealth Bank of Australia
Commonwealth Land - Commonwealth Trading Bank of Australia
Commonwealth Land - Defence Housing Authority
Commonwealth Land - Defence Service Homes Corporation
Commonwealth Land - Director of War Service Homes
Commonwealth Land - Telstra Corporation Limited
Defence - CAMP SAPPER-EAST HILLS (Lot 2) : CAMP SAPPER TRAINING AREA (Lot 1)
Defence - EAST HILLS BARRACKS - OP SAFE HAVEN
Defence - INGLEBURN AREA (Bardia Barracks)
Defence - MOOREBANK AREA INC SME
Defence - Suite 8, Library Plaza
Defence - WET BRIDGING SITE - CASULA

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Indigenous		
Cubbitch Barta National Estate Area	NSW	Listed place
Historic		
Defence National Storage and Distribution Centre	NSW	Listed place
Old Army / Internment Camp Group Holsworthy	NSW	Listed place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Species or species habitat likely to occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable*	Species or species habitat likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered*	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat likely to occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Georges River Wetlands	NSW	Indicative Place
Voyager Point	NSW	Registered
Indigenous		
Cubbitch Barta National Estate Area	NSW	Registered
Historic		
Bankstown Airport	NSW	Indicative Place
Liverpool Fire Station	NSW	Indicative Place
The 13th Jyotirlinga (icon)	NSW	Indicative Place
Defence National Storage and Distribution Centre	NSW	Interim List
Bernera including Site and Knoll	NSW	Registered
Collingwood	NSW	Registered
Denham Court and St Marys Anglican Chapel	NSW	Registered
Glenfield Farm	NSW	Registered
Horningsea Park	NSW	Registered
Hoxton Park Airport	NSW	Registered
Ingleburn Army Camp	NSW	Registered
Kitchener House	NSW	Registered
Liverpool Courthouse (former)	NSW	Registered
Liverpool Dam	NSW	Registered
Liverpool Hospital (former)	NSW	Registered
Macquarie Field Garden	NSW	Registered
Macquarie Field House	NSW	Registered
Old Army / Internment Camp Group Holsworthy	NSW	Registered
Prefabricated Cottages Ingleburn Village	NSW	Registered
Robin Hood Farm	NSW	Registered
St Lukes Anglican Church	NSW	Registered
The Homestead	NSW	Registered
Varro Ville	NSW	Registered

State and Territory Reserves [Resource Information]

Name	State
Gandangara	NSW
Georges River	NSW
Leacock	NSW

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Carduelis chloris European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
[Rattus norvegicus](#) Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
[Rattus rattus](#) Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
[Vulpes vulpes](#) Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
[Alternanthera philoxeroides](#) Alligator Weed [11620]		Species or species habitat likely to occur within area
[Anredera cordifolia](#) Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
[Asparagus aethiopicus](#) Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
[Asparagus asparagoides](#) Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
[Asparagus plumosus](#) Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
[Asparagus scandens](#) Asparagus Fern, Climbing Asparagus Fern [23255]		Species or species habitat likely to occur within area
[Cabomba caroliniana](#) Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
[Chrysanthemoides monilifera](#) Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
[Chrysanthemoides monilifera subsp. monilifera](#) Boneseed [16905]		Species or species habitat likely to occur within area
[Chrysanthemoides monilifera subsp. rotundata](#) Bitou Bush [16332]		Species or species habitat likely to occur within area
[Cytisus scoparius](#) Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
[Dolichandra unguis-cati](#) Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
[Eichhornia crassipes](#) Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
[Genista linifolia](#) Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
[Genista monspessulana](#) Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom		Species or species habitat likely to occur

Name	Status	Type of Presence
[20126]		within area
Genista sp. X Genista monspessulana		
Broom [67538]		Species or species habitat may occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum		
African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana		
Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma		
Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Opuntia spp.		
Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata		
Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Protasparagus plumosus		
Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate		
Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla		
Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Ulex europaeus		
Gorse, Furze [7693]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus		
Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Liverpool Military Training Area	NSW
Voyager Point	NSW

Coordinates

-33.9661 150.90721

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix 3

Threatened Flora and Fauna Assessment – Species Assessment Table

Species, populations and communities with a likelihood of occurrence of Moderate or greater have had potential impacts formally assessed using a 7-part test under the *Environmental Planning and Assessment Act 1979* or EPBC Assessment (see Appendix 7).

Species recorded on the site during surveys are denoted by bold text.

E1 - Endangered; E2 - Endangered Population; E3 - Endangered ecological community; E4 Critically endangered; P - Protected; K - Known occurrence; PR - Predicted occurrence; V - Vulnerable; E4 critically endangered

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Amphibians							
Heleioporus australiacus	Giant Burrowing Frog	V, P	V	Distributed in south eastern NSW and Victoria, a northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except clay based. With a preference to Ridgetop, headwater and slow-flowing or intermittent streams. They have also been observed occupying artificial ponded structures that are still surrounded by other undisturbed habitat. Breeding habitat is generally soaks or pools within first or second order streams.	25	Low. Site is highly disturbed No headwaters or permanent water/streams in close proximity to the subject site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Mixophyes balbus	Stuttering Frog, Southern Barred Frog	E1, P, 2	V	Stuttering Frogs occur along the east coast of Australia from southern Qld to north-eastern Victoria. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor.	P	Low. No wet forests or streams.	Low.
Pseudophryne australis	Red-crowned Toadlet	V,P	-	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings. Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter.	27	Low. Site is highly disturbed with an absence of low growing dense vegetation, leaf litter or rocky shelter.	Low.
Litoria aurea	Green and Golden Bell Frog	E1, P	V	Distributed from NSW north coast near Brunswick Heads, southwards along NSW coast to Victoria where it extends into east Gippsland. Inhabits marshes, dams and stream-sides, particularly those containing bulrushes or spikerushes. Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (Gambusia holbrooki), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.	14	Moderate. Site may provide limited suitable habitat for this species.	Low. Extensive targeted seasonal surveys indicated that it is unlikely that this species is actually present on the site.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Litoria littlejohni	Littlejohn's Tree Frog, Heath Frog	V, P	V	Distribution includes the plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest south to Buchan in Victoria. This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation.	K	Low. No permanent streams, swamps or heath-based forests within the subject site. Site is highly disturbed with an absence of low growing dense vegetation or leaf litter.	Low.
Litoria raniformis	Growling Grass Frog	E	V	Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. Found mostly amongst emergent vegetation, including Typha sp. (bullrush), Phragmites sp. (reeds) and Eleocharis sp. (sedges), in or at the edges of still or slow-flowing water bodies such as lagoons, swamps, lakes, ponds and farm dams.	-	Low. Subject site is not within the known range for this species. Site is highly disturbed with little suitable habitat for this species. This species was not identified during targeted amphibian surveys.	Low.
Reptiles							

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Caretta caretta	Loggerhead Turtle	E1,P	E	Occur in coral reefs, bays and estuaries in tropical and warm temperate waters off the coast of Queensland, Northern Territory, Western Australia and New South Wales.	P	Low. Subject site is not suitable for this species.	Low.
Dermochelys coriacea	Leatherback Turtle	E1,P	E	Most commonly reported feeding in coastal waters in central eastern Australia.	P	Low. Subject site is not suitable for this species.	Low.
Varanus rosenbergi	Rosenberg's Goanna	V,P	-	Occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. Found in heath, open forest and woodland.	4	Low. Generally known from sandstone environments. Subject site is highly disturbed and fragmented from larger tracts of vegetation. This species was not observed on site during surveys nor was any visual signs of this species observed.	Low.
Hoplocephalus bungaroides	Broad-headed Snake	E1, P, 2	V	The Broad-headed Snake is largely confined to Triassic and Permian sandstones. Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges. Moves from the sandstone rocks to shelters in hollows in large trees within 200m of escarpments in summer.	7	Low. Generally known from sandstone environments. Subject site is not suitable for the presence of this species. No rocky shelters available on site.	Low.
Birds							

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Stictonetta naevosa	Freckled Duck	V,P	-	Found primarily in south-eastern and south-western Australia. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	K	Low. The site does not provide suitable habitat requirements for the presence of this species. This species was not observed on site.	Low.
Ptilinopus superbus	Superb Fruit-Dove	V, P		Occurs primarily from north-eastern Qld to north-eastern NSW. It is much less common further south. Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	K	Low. The site does not provide suitable habitat requirements for the presence of this species. This species was not observed on site.	Low.
Ephippiorhynchus asiaticus	Black-necked Stork	E1, P	-	Widespread in coastal and sub-coastal northern and eastern Australia, south to central-eastern NSW. Mainly found on shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands.	1	Low-moderate. Site does contain a small artificial dam that may provide suitable habitat conditions as part of a larger home range. It is unlikely that this dam provides significant habitat value to this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Botaurus poiciloptilus	Australasian Bittern	E1, P	E	Inhabits terrestrial and estuarine wetlands, generally where there is permanent water. The species prefers wetlands with dense vegetation, including sedges, rushes and reeds.	K	Low. No wetlands or permanent water/wetlands suitable for this species. Little to no vegetation surrounds this artificial dam.	Low.
Ixobrychus flavicollis	Black Bittern	V, P	-	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	K	Low. No wetlands or permanent water/wetlands suitable for this species. Little to no vegetation surrounds this artificial dam.	Low.
Circus assimilis	Spotted Harrier	V,P	-	Grassy open woodland, inland riparian woodland, grassland and shrub steppe. Most commonly found in native grassland but also in agricultural areas.	2	Low. The site may form part of a larger home range however is highly disturbed with very little to no native grasses present.	Low.
Hieraaetus morphnoides	Little Eagle	V,P	-	Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used	23	Low-Moderate. Suitable habitat for the presence of this species. This species may use the site as part of a larger home range. Site is highly disturbed with little foraging potential. This species was not identified during field surveys.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Lophoictinia isura	Square-tailed Kite	V,P,3	-	Timbered habitats including dry woodlands and open forests. Prefers timbered watercourses. Specialist hunter of passerines and insects.	2	Low-Moderate. Suitable habitat for the presence of this species. This species may use the site as part of a larger home range. Site is highly disturbed with little foraging potential. This species was not identified during field surveys.	Low.
Pandion cristatus	Eastern Osprey	V,P,3	-	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes	K	Low. Site is not suitable habitat for the presence of this species.	Low.
Falco subniger	Black Falcon	V,P	-	Widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions.	2	Low-moderate. Suitable habitat for the presence of this species. This species may use the site as part of a larger home range. Site is highly disturbed with little foraging potential. This species was not identified during field surveys.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Burhinus grallarius	Bush Stone-curlew	E1,P	-	Wader-like bird that can be difficult to see in its lightly timbered, open forest or woodland habitat. Dry, open grassland and cropland, with cover nearby, may also provide habitat for the species.	3	Low-moderate. Site may provide some suitable habitat requirements for the presence of this species. Site is highly disturbed with only one artificial dam available for use. This species was not identified during field surveys.	Low.
Esacus magnirostris	Beach Stone-curlew	E4A,P	-	Found exclusively along the coast, on a wide range of beaches, islands, reefs and in estuaries, and may often be seen at the edges of or near mangroves.	K	Low. Site is not suitable habitat for the presence of this species.	Low.
Haematopus fuliginosus	Sooty Oystercatcher	V, P	-	Sooty Oystercatchers are found around the entire Australian coast. Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	K	Low. Site is not suitable habitat for the presence of this species.	Low.
Haematopus longirostris	Pied Oystercatcher	E1, P	-	The species is distributed around the entire Australian coastline. Favours intertidal flats of inlets and bays, open beaches and sandbanks. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas.	K	Low. Site is not suitable habitat for the presence of this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Irediparra gallinacea	Comb-crested Jacana	V,P	-	Occurs on freshwater wetlands in northern and eastern Australia, mainly in coastal and subcoastal regions. Inhabit permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	K	Low. Site may provide some suitable habitat requirements for the presence of this species. Site is highly disturbed with only one artificial dam available for use. This species was not identified during field surveys.	Low.
Rostratula Australia	Australian Painted Snipe	E1,P	E	Restricted to Australia. Most records are from the south east, particularly the Murray Darling Basin. In NSW many records are from the Murray-Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	K	Low. Site is not suitable habitat for the presence of this species. Site is highly disturbed with only one artificial dam available for use. This species was not identified during field surveys.	Low.
Calidris ferruginea	Curlew Sandpiper	E1, P	C, J, K	This species is distributed around most of the coastline of Australia. Generally occupies littoral and estuarine habitats, and in NSW is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes the inland.	K	Low. Site is not suitable habitat for the presence of this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Limicola falcinellus	Broad-billed Sandpiper	V, P	C, J, K	Occurs in sheltered coastal areas, favouring estuarine mudflats and occasionally saltmarshes, shallow freshwater lagoons, saltworks and sewage farms, and in areas with large soft intertidal mudflats, which may have shell or sandbanks nearby.	K	Low. Site is not suitable habitat for the presence of this species.	Low.
Limosa limosa	Black-tailed Godwit	V, P	C, J, K	This species is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, can be found on mudflats and in water less than 10cm deep, around muddy lakes and swamps.	K	Low. Site is not suitable habitat for the presence of this species.	Low.
Sterna albifrons	Little Tern	E1, P	C, J, K	Found on the north, east and south-east Australian coasts. Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers. Nests in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands.	K	Low. Site is not suitable habitat for the presence of this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Callocephalon fimbriatum	Gang-gang Cockatoo	V, P, 3	-	Distributed from southern Victoria through south- and central-eastern New South Wales. In summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas	10	Low-Moderate. Site may provide suitable habitat and may be used as part of a larger home range. Site is highly disturbed very open woodland. This species was not identified during field surveys.	Low.
Calyptorhynchus lathami	Glossy Black-Cockatoo	V,P,2	-	Feeds almost exclusively on the seeds of Casuarina sp. and Allocasuarina sp. Open forest and woodlands up to 1000m with feed trees present.	15	Low. No mature feed trees suitable on the site. Site is highly disturbed very open woodland. This species was not identified during field surveys.	Low.
Glossopsitta pusilla	Little Lorikeet	V,P	-	Forages in flowering eucalypts and Melaleuca sp. Riparian habitats are particularly used, due to higher soil fertility and greater productivity. Nests in tree hollows.	22	Low-Moderate. This highly mobile species may forage on flowering Eucalyptus sp. within the subject site as part of a larger home range. Site is highly disturbed very open woodland. This species was not identified during field surveys.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Lathamus discolor	Swift Parrot	E1,P,3	E	Migrates to south-eastern mainland Mar-Oct. Winter-flowering trees such as Eucalyptus robusta, Corymbia maculata, C. gummifera, E. sideroxylon and E. albens are important. Breeds in Tasmania.	9	Low-moderate. Preferred winter-flowering tree species absent from the site. This species may use the site as part of a larger home foraging range. Site is highly disturbed very open woodland. This species was not identified during field surveys.	Low.
Neophema pulchella	Turquoise Parrot	V,P,3	-	Range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	K	Low-Moderate. This highly mobile species may use the subject site as part of a larger home range. Site is highly disturbed very open woodland. This species was not identified during field surveys.	Low.
Pezoporus wallicus	Eastern Ground Parrot	V, P, 3	-	This species inhabits south-eastern Australia from southern Queensland through NSW to western Victoria. The Ground Parrot occurs in high rainfall coastal and near coastal low heathlands and sedgelands, generally below one metre in height and very dense (up to 90% projected foliage cover).	K	Low. Site is not suitable habitat for the presence of this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Ninox connivens	Barking Owl	V,P,3	-	Woodland and open forest including fragmented remnants and partly cleared farmland. Preferentially hunts small arboreal mammals such as squirrel gliders and ringtail possums. But as prey decreases becomes reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Large tree hollows are used for nesting.	1	Low-Moderate. Potential foraging habitat is present. This is a highly mobile species. Hollow trees are present on site but not of a size required by this species. This species may use the site as part of a larger home range. Site is highly disturbed with little potential for prey to forage on.	Low.
Ninox strenua	Powerful Owl	V,P,3	-	Endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range. Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.	26	Low-Moderate. Potential foraging habitat is present. This is a highly mobile species. Hollow trees are present on site but not of a size required by this species. This species may use the site as part of a larger home range. Site is highly disturbed with little potential for prey to forage on.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Tyto novaehollandiae	Masked Owl	V,P,3	-	Extends from the coast where it is most abundant to the western plains. Lives in dry eucalypt forests and woodlands from sea level to 1100m.	K	Low-Moderate. Potential foraging habitat is present. This is a highly mobile species. This species may use the site as part of a larger home range. Site is highly disturbed with little potential for prey to forage on.	Low.
Tyto tenebricosa	Sooty Owl	V, P, 3	-	Occurring on the coast, coastal escarpment and eastern tablelands. There is no seasonal variation in its distribution. Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosts by day in the hollow of a tall forest tree or in heavy vegetation.	K	Low. Site is not suitable habitat for the presence of this species.	Low.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V,P	-	Eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. Mainly inhabits woodlands dominated by rough-barked eucalypts, usually with a grassy or sparse shrub understorey. Fallen timber is an important habitat component for foraging. Nests in tree hollows.	5	Low-Moderate. Site may provide suitable habitat for the presence of this species. This is a highly mobile species. This species may use the site as part of a larger home range, although it is considered unlikely.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Dasyornis brachypterus	Eastern Bristlebird	E1, P	E	Habitat is characterised by dense, low vegetation including heath and open woodland with a heathy understorey. Age of habitat since fires (fire-age) is of paramount importance to this species; Illawarra and southern populations reach maximum densities in habitat that has not been burnt for at least 15 years.	P	Low. Site is not suitable habitat for the presence of this species.	Low.
Chthonicola sagittata	Speckled Warbler	V,P	-	Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies.Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.	6	Low. Site is not suitable habitat for the presence of this species. Site is highly disturbed with little native grass/shrub understorey.	Low.
Anthochaera phrygia	Regent Honeyeater	E4A,P	E	Dry open forest and woodland. Particularly box-ironbark woodland and riparian forests of river sheoak. Feeds on the nectar from a wide range of eucalypts and mistletoes.	8	Low-Moderate. Potential foraging habitat occurs within the subject site. Site is highly disturbed with a degraded riparian habitat. This species may use the site as part of a larger home foraging range. This species was not identified during field surveys.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Epthianura albifrons	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P	-	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.	1	Low. Site is not suitable habitat for the presence of this species.	Low.
Epthianura albifrons	White Fronted chat	V,P	-	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.	1	Low. Site is not suitable habitat for the presence of this species.	Low.
Grantiella picta	Painted Honeyeater	V,P	-	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. Feeds on fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	K	Low-Moderate. Site may provide some suitable foraging habitat. This species may use the site as part of a larger home range. Site is highly disturbed and fragmented from larger tracks of vegetation. This species was not identified during field surveys.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V,P	-	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark, White Box, Inland Grey Box, Yellow Box, Blakely's Red Gum and Forest Red Gum. Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.	7	Low-Moderate. Site may provide some suitable foraging habitat. This species may use the site as part of a larger home range. Site is highly disturbed and fragmented from larger tracks of vegetation. This species was not identified during field surveys.	Low.
Daphoenositta chrysoptera	Varied Sittella	V,P	-	Eucalypt forests and woodlands, particularly those with rough-barked species, mature smooth-barked gums with dead branches, mallee and Acacia woodland.	72	Low-Moderate. Site may provide some suitable foraging habitat. This species may use the site as part of a larger home range for foraging. Site is highly disturbed and fragmented from larger tracks of vegetation. This species was not identified during field surveys.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V,P	-	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches.	2	Low. The site does not provide the structural diversity of shrubs/native grasses required for the presence of this species. Site is highly disturbed and fragmented.	Low.
Petroica boodang	Scarlet Robin	V,P	-	Dry eucalypt forests and woodland with open grassy understorey with few scattered shrubs. Occurs in both mature and regrowth forests and occasionally occurs in mallee, wet forests, wetlands and tea-tree swamps.	12	Low. The site does not provide the structural diversity of shrubs/native grasses required for the presence of this species. Site is highly disturbed and fragmented.	Low.
Petroica phoenicea	Flame Robin	V,P	-	Prefers clearings or areas with open understorey. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. In winter birds migrate to drier more open habitats in the lowlands (valleys and western slopes and plains).	3	Low-Moderate. Suitable habitat for the presence of this species. The site may provide certain habitat components for the presence of this species as part of a larger home range. This species was not observed during field surveys.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Stagonopleura guttata	Diamond Firetail	V,P	-	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland. Often found in riparian areas and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects.	K	Low. The site is highly disturbed with little native grass cover required for feeding.	Low.
Sternula nereis nereis	Australian Fairy Tern	-	V	Occurs along the coasts of Victoria, Tasmania, SA and WA. The subspecies has been known from NSW in the past, but it is unknown if it persists there. Nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. Has been found in embayments including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline.	-	Low. Site is not suitable habitat for the presence of this species.	Low.
Apus pacidicus	Fork-tailed Swift	-	Migratory Marine	In NSW, the species is recorded in all regions. Many records occur east of the Great Divide. The Fork-tailed Swift is almost exclusively aerial with them foraging and roosting aerially.	Likely to occur within the area	Low-moderate. This species may use the site occasionally as part of a larger home foraging range. Site is highly disturbed with limited foraging potential.	Low

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Ardea alba	Great Egret, White Egret	-	Migratory Wetland	The Eastern Great Egret has been reported in a wide range of wetland habitats. The species usually frequents shallow waters. May potentially occur at wetlands that also support a range of other waterbirds or shorebirds, such as the Australian Painted Snipe	Known to occur within the area	Low-moderate. The site does contain an artificial dam that may provide some suitable habitat for this species. However, the dam is not of a size that is likely to support any population of this species. Site is highly disturbed and fragmented.	Low.
Ardea ibis	Cattle Egret	-	Migratory Wetland	Two major distributions have been located; from north-east WA to the Top End of the Northern Territory and around south-east Australia. The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. Observed in moist, low-lying poorly drained pastures with an abundance of high grass; it avoids low grass pastures.	Likely to occur within the area	Low-moderate. The site does contain an artificial dam that may provide some suitable habitat for this species. However, the dam is not of a size that is likely to support any population of this species. Site is not the preferred grassland habitat. Site is highly disturbed and fragmented.	Low.
Gallinago hardwickii	Latham's Snip, Japanese Snipe	-	Migratory Wetland	Latham's Snipe is a non-breeding visitor to south-eastern Australia. This species occurs in permanent and ephemeral wetlands up to 2000m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation.	May occur within the area	Low. Site does not provide suitable conditions for the presence of this species. Site is highly disturbed and fragmented.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Rostratula benghalensis	Painted Snipe	-	E Migratory Wetland	Generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	Likely to occur within the area	Low. Site does not provide suitable conditions for the presence of this species. Site is highly disturbed and fragmented.	Low.
Haliaeetus leucogaster	White-bellied Sea-Eagle	-	Migratory Terrestrial	Distributed along the coastline of Australia, also extending inland along some larger waterways. Habitat includes large areas of open water. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest. Breeding territories are close to water, mainly in tall open forest or woodland, although nests are sometimes located in other habitats such as dense forest, closed scrub or in remnant trees on cleared land.	Known to occur in the area	Low-moderate. Site may provide some suitable habitat for the presence of this species. The site may form part of a larger home foraging range, however is unlikely to form a critical component of habitat for this species. Site is highly disturbed and fragmented.	Low.
Hirundapus caudacutus	White-throated Needletail	-	Migratory Terrestrial	Recorded in all coastal regions of Qld and NSW. In Australia, this species is almost exclusively aerial, almost always foraging aerially. Although it has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. Probably recorded most often above wooded areas, including open forest and rainforest.	Known to occur in the area	Low-moderate. Site may provide some suitable habitat for the presence of this species. The site may form part of a larger home foraging range, however is unlikely to form a critical component of habitat for this species. Site is highly disturbed and fragmented.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Merops ornatus	Rainbow Bee-eater	-	Migratory Terrestrial	The Rainbow Bee-eater is distributed across much of mainland Australia occurring mainly in open forests (usually dominated by eucalypts) and woodlands, shrublands, and in various cleared or semi-cleared habitats.	May occur within the area	Low-moderate. Site may provide some suitable habitat for the presence of this species. The site may form part of a larger home foraging range, however is unlikely to form a critical component of habitat for this species. Site is highly disturbed and fragmented.	Low.
Monarcha melanopsis	Black-faced Monarch	-	Migratory Terrestrial	The Black-faced Monarch is widespread in eastern Australia. Mainly occurs in rainforest ecosystems although it can be found in gullies in mountain areas or coastal foothills, softwood scrub dominated by Brigalow (Acacia harpophylla), coastal scrub dominated by Coast Banksia (Banksia integrifolia) and Southern Mahogany.	Known to occur in the area	Low. Site does not provide suitable conditions for the presence of this species. Site is highly disturbed and fragmented.	Low.
Monarcha trivirgatus	Spectacled Monarch	-	Migratory Terrestrial	Occurs in dense rainforests and moist eucalypt forests of eastern and north-eastern Australia, the Spectacled Monarch sometimes also inhabits mangroves and other densely vegetated habitats.	Known to occur in the area	Low. Site does not provide suitable conditions for the presence of this species. Site is highly disturbed open woodland.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Myiagra cyanoleuca	Satin Flycatcher	-	Migratory Terrestrial	The Satin Flycatcher is widespread in eastern Australia. Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	Known to occur in the area	Low. Site does not provide suitable conditions for the presence of this species. Site is highly disturbed open woodland.	Low.
Rhipidura rufifrons	Rufous Fantail	-	Migratory Terrestrial	The Rufous Fantail occurs in coastal and near coastal districts of northern and eastern Australia. In east and south-east Australia, this species mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood, Mountain Grey Gum, Narrow-leaved Peppermint, Mountain Ash, Alpine Ash, Blackbutt or Red Mahogany; usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; for example near Bega in south-east NSW, where they are recorded in temperate Lilly Pilly rainforest, with Grey Myrtle, Sassafras and Sweet Pittosporum subdominants.	Known to occur in the area	Low. Site does not provide suitable conditions for the presence of this species. Site is highly disturbed open woodland with no shrub understorey.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Mammals							
Dasyurus maculatus	Spotted-tailed Quoll	V,P	E	A variety of vegetation such as rainforest, open forest, woodland, coastal heath, inland riparian forest. Have home ranges 750 - 3500 ha. Den sites may be located in hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky cliffs.	7	Low-Moderate. Due to the highly disturbed and fragmented nature of the site, it is unlikely that this species would use the site as part of a larger home range. No evidence of den or latrine sites were found within the subject site. Hollow bearing trees were present but not suitable for this species	Low.
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E1,P	E	Species is largely crepuscular (active mainly after dusk and/or before dawn). They are generally only found in heath or open forest with a heathy understorey on sandy or friable soils.	K	Low-Moderate. Due to the highly disturbed and fragmented nature of the site, it is unlikely that this species would use the site as part of a larger home range. No shrub understorey is present. No evidence of this species was observed within the subject site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Phascolarctos cinereus	Koala	V,P	V	Found in eucalypt woodlands and forest foraging on preferred food trees.	985	Moderate. Records of koalas within close proximity to the subject site, koala may potentially be present as part of a larger home range. The fragmentation of the site, adjoining rail lines, river & roadways indicate an unlikely use of this site by this species. There was no evidence of this species observed during the field surveys.	Low. The potential for impact on this species is further assessed in Appendix 7
Cercartetus nanus	Eastern Pygmy-possum	V,P	-	Variety of habitats from rainforest to dry sclerophyll forest and woodland to heath. In most areas they prefer woodlands and heath. Feeds on nectar and pollen from banksias, eucalypts and Callistemon sp., with insects also taken.	7	Low. The exposed, isolated and disturbed nature of the site means that it is unlikely that this species occurs on the site. There was no evidence of this species observed during the field surveys.	Low.
Petaurus australis	Yellow-bellied Glider	V,P	-	Tall mature eucalypt forest, generally in areas with high rainfall and nutrient rich soils. Feed primarily on nectar, sap, honeydew and manna with pollen and insects also taken. Often leave a distinctive V-shaped feeding scar on tree trunks. Den in tree hollows of large trees.	3	Low. Site is generally not suitable habitat for the presence of this species. Site is a highly disturbed fragmented open woodland. No evidence of feeding scars were recorded.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Petaurus norfolcensis	Squirrel Glider	V,P	-	Inhabits mature or old growth box, box-ironbark woodlands and river red gum forest west of the Great Dividing Range. Prefers mixed species stands with a shrub or Acacia midstorey. Uses tree hollows as den sites.	4	Low. Site is generally not suitable habitat for the presence of this species. Site is a highly disturbed fragmented open woodland with no shrub understorey.	Low.
Petrogale penicillata	Brush-tailed Rock-wallaby	E1, P	V	Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges often facing north.	1	Low. Site is not suitable habitat for the presence of this species.	Low.
Pteropus poliocephalus	**Grey-headed Flying-fox**	**V, P**	**V**	**This species is generally found within 200 km of Australia's eastern coast. Generally occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are commonly found in gullies, close to water, in vegetation with a dense canopy.**	**77**	**High (recorded on-site). Site provides some foraging potential as part of a much larger home range. The site does not contain any known or identifiable permanent roosting sites (camps).**	**Moderate. The potential for impact on this species is further assessed in Appendix 7**

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P	-	Wide-ranging species found across northern and eastern Australia. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows	5	Moderate. Highly mobile species that may forage within the subject site at some stage. Site may provide suitable habitat in the form of tree hollows. There was no evidence of this species observed during the field surveys.	Moderate. The potential for impact on this species is further assessed through a seven part test in Appendix 7
Mormopterus norfolkensis	East-coast Freetail-bat	V, P	-	The Eastern Freetail-bat is found along the east coast from south QLD to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark.	37	Moderate. Highly mobile species that may forage within the subject site at some stage. Site may provide suitable habitat in the form of tree hollows. There was no evidence of this species observed during the field surveys.	Moderate. The potential for impact on this species is further assessed through a seven part test in Appendix 7

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	V, P	V	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these features. Also found in well-timbered areas containing gullies.	8	Low. Site may provide some foraging potential as part of a much larger home range. The site does not contain any caves for roost sites.	Low.
Falsistrellus tasmaniensis	Eastern False Pipistrelle Eastern falsistrelle	V,P	-	Found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	10	Moderate. Highly mobile species that may forage within the subject site at some stage. Site may provide suitable habitat in the form of tree hollows. There was no evidence of this species observed during the field surveys.	Moderate. The potential for impact on this species is further assessed through a seven part test in Appendix 7
Kerivoula papuensis	Golden-tipped Bat	V, P	-	Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests. Roost mainly in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests, also in tree hollows, dense foliage and epiphytes; located in rainforest gullies on small first- and second-order streams.	K	Low. Site is not suitable habitat for the presence of this species. Site is open degraded woodland.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Miniopterus australis	Little Bentwing-bat	V,P	-	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas.Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	K	High (recorded on-site). Highly mobile species that has been recorded foraging within the subject site. Site may provide suitable habitat in the form of tree hollows.	Moderate. The potential for impact on this species is further assessed through a seven part test in Appendix 7
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V,P	-	Forages in a range of habitat types. Roosts in caves, derelict mines, culverts and other man-made structures. Form maternity colonies that are faithful to particular caves.	39	High (recorded on-site). Highly mobile species that has been recorded foraging within the subject site. Site may provide suitable habitat in the form of tree hollows.	Moderate. The potential for impact on this species is further assessed through a seven part test in Appendix 7

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Myotis macropus	Southern Myotis, Large footed Myotis	V,P	-	Forages over streams and pools catching insects and small fish by raking their feet across the water surface. Roost close to water in caves, mine shafts, tree hollows and man-made structures.	311	Moderate. Highly mobile species that may forage within the subject site at some stage. Site may provide suitable habitat in the form of tree hollows. There was no evidence of this species observed during the field surveys.	Moderate. The potential for impact on this species is further assessed through a seven part test in Appendix 7
Scoteanax rueppellii	Greater Broad-nosed Bat	V, P	-	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. This species usually roosts in tree hollows.	29	Moderate. Highly mobile species that may forage within the subject site at some stage. Site may provide suitable habitat in the form of tree hollows. There was no evidence of this species observed during the field surveys.	Moderate. The potential for impact on this species is further assessed through a seven part test in Appendix 7
Potorous tridactylus	Long-nosed Potoroo (SE mainland)	V, P	V	Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	May occur within the area	Low. Site does not provide the required habitat features for the presence of this species. Site is heavily degraded cleared open woodland with no shrub understorey present.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pseudomys novaehollandiae	New Holland Mouse, Pookila	P	V	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.	K	Low. Site does not provide the required habitat features for the presence of this species. Site is heavily degraded cleared open woodland with no shrub understorey present.	Low.
Menippus darcyi	Menippus darcyi population in the Sutherland Shire	E2	-	Confined to Grays Point Reserves, Grays Point, and Sutherland Shire. This species has been recorded from only three locations in Australia: Lord Howe Island, coastal North Queensland and Grays Point Reserve. Little is known of ecology. Larvae graze on Celtis paniculata, which grow in littoral rainforest.	K	Low. Site does not provide the required conditions for the presence of this species.	Low.
Meridolum corneovirens	Cumberland Plain Land Snail	E1	-	Primarily inhabits Cumberland Plain Woodland. This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish.	273	Moderate. Site is highly disturbed and fragmented, however, may provide suitable conditions for the presence of this species. There was no evidence of this species observed during the field surveys.	Low. The potential for impact on this species is further assessed through a seven part test in Appendix 7

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Plants							
Caesia parviflora var. minor	Small Pale Grass-lily	E1,P	-	Found in damp places in open forest on sandstone.	K	Low. Site is not suitable for the presence of this species. Site is highly disturbed and modified. This species was not identified at the site.	Low.
Cynanchum elegans	White-flowered Wax Plant	E1,P	E	Occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree *Leptospermum laevigatum* – Coastal Banksia *integrifolia* subsp. *integrifolia* coastal scrub; Forest Red Gum *Eucalyptus tereticornis* aligned open forest and woodland; Spotted Gum *Corymbia maculata* aligned open forest and woodland; and Bracelet Honeymyrtle *Melaleuca armillaris* scrub to open scrub. Flowering occurs between August and May, with a peak in November. Flower abundance on individual plants varies from sparse to prolific.	1	Low. Site is not suitable for the presence of this species. Site is highly disturbed and modified. This species was not identified at the site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Marsdenia viridiflora subsp. viridiflora	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown Fairfield, Holroyd, Liverpool and Penrith local government areas	E2	-	Grows in vine thickets and open shale woodland.	6	Low. Site is not suitable for the presence of this species. Site is highly disturbed and modified. This species was not identified at the site.	Low.
Astrotricha crassifolia	Thick-leaf Star-hair	V,P	V	Occurs in dry sclerophyll woodland on sandstone.	1	Low-moderate. Site may provide suitable conditions for the presence of this species. However, site is highly disturbed. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Wahlenbergia multicaulis	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2	-	Found in disturbed sites and grows in a variety of habitats including forest, woodland, scrub, grassland and the edges of watercourses and wetlands. Typically occurs in damp, disturbed sites (with natural or human disturbance of various forms), typically amongst other herbs rather than in the open. Usually flowers throughout the year, although a late spring/early summer peak has been observed at some locations Creek.	K	Low-moderate. Site may provide suitable conditions for the presence of this endangered population, however Campbelltown LGA is not included in the listing. Site is generally a dry environment. This species was not identified on site during surveys.	Low.
Allocasuarina glareicola	-	E1,P	E	Found in open woodland with Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla and Melaleuca decora. Common associated understorey species include Melaleuca nodosa, Hakea dactyloides, Hakea sericea, Dillwynia tenuifolia, Micromyrtus minutiflora, Acacia elongata, Acacia brownei, Themeda australis and Xanthorrhoea minor.	1	Low. This tree species was not identified on site. Associated species are generally absent from the site.	Low.
Wilsonia backhousei	Narrow-leafed Wilsonia	V,P	-	Found on the coast between Mimosa Rocks National Park and Wamberal north of Sydney This is a species of the margins of salt marshes and lakes.	K	Low. Site is not suitable for the presence of this species. Site is highly disturbed and modified. This species was not identified at the site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Wilsonia rotundifolia	Round-leafed Wilsonia	E1,P	-	Known from several sites in the Jervis Bay area, Royal National Park, near Deniliquin and on the lakebeds of Lake George and Lake Bathurst when these are exposed during droughts. Grows in mud in coastal saltmarsh and inland saline or brackish lake beds.	K	Low. Site is not suitable for the presence of this species. Site is highly disturbed and modified. This species was not identified at the site.	Low.
Callitris endlicheri	Black Cypress Pine,Woronora Plateau population	E2	-	The population of Callitris endlicheri on Woronora Plateau, in the local government area of Wollongong, represents the coastal limit of the species' range and is disjunct from other known populations of the species. Throughout its range, the species is usually found on stony hills or ridges, common, from the plains to the coastal ranges.	K	Low. Site is not suitable for the presence of this species. This species was not identified at the site.	Low.
Hibbertia puberula	-	E1,P	-	Occurs on sandy soil often associated with sandstone, or on clay. Habitats are typically dry sclerophyll woodland communities, although heaths are also occupied.	K	Low-moderate. Site may provide suitable conditions for the presence of this species. Site is highly disturbed with a degraded groundcover assemblage. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Hibbertia sp. Bankstown		E4A,P	CE	This species is endemic to New South Wales and is currently known to occur in only one population at Bankstown Airport in Sydney's southern suburbs, in the Bankstown local government area. The airport site is very heavily modified from the natural state, lacks canopy species and is currently a low grass/shrub association with many pasture grasses and other introduced herbaceous weeds.	K	Low-moderate. The site may provide suitable conditions for the presence of this species. This species was not identified on site.	Low.
Hibbertia stricta subsp. furcatula		E1,P	-	Known to occur in two populations, one in the southern outskirts of Sydney, and one near Nowra on the mid-South Coast of NSW. Habitat of the South Coast population is poorly recorded, but appears to be dry sclerophyll forest or woodland associations in sandy soils over sandstone.	K	Low-moderate. The site may provide suitable conditions for the presence of this species. This species was not identified on site.	Low.
Hibbertia superans		E1,P	-	Occurs on sandstone ridgetops often near the shale/sandstone boundary in both open woodland and heathland, and appears to prefer open disturbed areas, such as tracksides.	K	Low-moderate. The site may provide suitable conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Tetratheca glandulosa		V,P	-	Associated with shale-sandstone transition habitats. Vegetation structure varies from heaths and scrub to woodlands/open woodlands, and open forest. Vegetation communities. Common woodland tree species include: Corymbia gummifera, C. eximia, Eucalyptus haemastoma, E. punctata, E. racemosa, and/or E. sparsifolia, with an understorey dominated by species from the families Proteaceae, Fabaceae, and Epacridaceae.	K	Low. Associated shrub / groundcover species are absent from the site. This species was not identified on site.	Low.
Epacris purpurascens var. purpurascens		V,P	-	Found in a range of habitat types, most of which have a strong shale soil influence.	K	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Leucopogon exolasius	Woronora Beard-heath	V,P	V	Woronora Beard-heath is found along the upper Georges River area and in Heathcote National Park. The plant occurs in woodland on sandstone.	16	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Leucopogon fletcheri subsp. fletcheri		E1,P	-	Occurs in dry eucalypt woodland or in shrubland on clayey lateritic soils, generally on flat to gently sloping terrain along ridges and spurs.	1	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Chamaesyce psammogeton	Sand Spurge	E1,P		Grows on fore-dunes, pebbly strandlines and exposed headlands, often with Spinifex (Spinifex sericeus) and Prickly Couch (Zoysia macrantha).	P	Low. Site does not provide suitable conditions for the presence of this species.	Low.
Dillwynia tenuifolia	Dillwynia tenuifolia, Kemps Creek	E2,V,P	-	The endangered population occurs in the area bounded by Western Road, Elizabeth Drive, Devonshire Road and Cross Street, Kemps Creek in the Liverpool Local Government Area. The population occurs on a small outlier of the Berkshire Park Soil Landscape. The site supports a transition from Castlereagh Ironbark Forest to Castlereagh Scribbly Gum Woodland. Portions of the site contain a form of Shale Gravel Transition Forest	18	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Dillwynia tenuifolia		V,P	-	May be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	25	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Pultenaea aristata	Prickly Bush-pea	V,P	V	The species occurs in either dry sclerophyll woodland or wet heath on sandstone.	40	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Pultenaea parviflora		E1,P	V	May be locally abundant, particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays.	85	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Pultenaea pedunculata	Matted Bush-pea	E1,P	-	The Matted Bush-pea occurs in a range of habitats. NSW populations are generally among woodland vegetation but plants have also been found on road batters and coastal cliffs. It is largely confined to loamy soils in dry gullies in populations in the Windellama area.	9	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Acacia baueri subsp. aspera		V,P		Occurs in low, damp heathlands, often on exposed rocky outcrops over a wide range of climatic and topographical conditions.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Acacia bynoeana	Bynoe's Wattle	E1,P	V	Occurs in heath or dry sclerophyll forest on sandy soils. Prefer opens, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	K	Low-moderate. The site may provide suitable conditions for the presence of this species. This species was not identified on site. Associated overstorey species assemblage is not consistent with the canopy species present on the GWS Site.	Low.
Acacia gordonii		E1,P	E	Grows in dry sclerophyll forest and heathlands amongst or within rock platforms on sandstone outcrops.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Acacia pubescens	Downy Wattle	V,P	V	Occurs on alluviums, shales and at the intergrade between shales and sandstones. Occurs in open woodland and forest, in a variety of plant communities, including Cooks River / Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland.	56	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Grammitis stenophylla	Narrow-leaf Finger Fern	E1,P,3	-	Moist places, usually near streams, on rocks or in trees, in rainforest and moist eucalypt forest.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Gyrostemon thesioides		E1,P,3	-	Only ever been recorded at three sites, to the west of Sydney, near the Colo, Georges and Nepean Rivers. Grows on hillsides and riverbanks and may be restricted to fine sandy soils.	31	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Haloragis exalata subsp. exalata	Square Raspwort	V,P	V	Square Raspwort occurs in 4 widely scattered localities in eastern NSW, distributed in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW. It appears to require protected and shaded damp situations in riparian habitats.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Haloragodendron lucasii		E1,P	E	The known locations of this species are confined to a very narrow distribution on the north shore of Sydney. Associated with dry sclerophyll forest. Reported to grow in moist sandy loam soils in sheltered aspects, and on gentle slopes below cliff-lines near creeks in low open woodland.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Camarophyllopsis kearneyi		E1,P	-	Its occurrence appears to be limited to the Lane Cove Bushland Park. Surveys in potentially suitable habitats elsewhere in the Sydney Basin Bioregion have failed to find Camarophyllopsis kearneyi.	K	Low-moderate. The site may provide suitable conditions for the presence of this species though there is limited detail as to its specific requirements. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Hygrocybe anomala var. ianthinomarginata		V,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Hygrocybe aurantipes		V,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Hygrocybe austropratensis		E1,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Hygrocybe collucera		E1,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Hygrocybe griseoramosa		E1,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Hygrocybe lanecovensis		E1,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Hygrocybe reesiae		V,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Hygrocybe rubronivea		V,P	-	Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum).	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Maundia triglochinoides		V,P	-	Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Prostanthera densa	Villous Mint-bush	V,P	V	Villous Mintbush is generally grows in sclerophyll forest and shrubland on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Hypsela sessiliflora		E1,P,3	X	Known to grow in damp places, on the Cumberland Plain, including freshwater wetland, grassland/alluvial woodland and an alluvial woodland/shale plains woodland (Cumberland Plain Woodland) ecotone	K	Low-moderate. The site may provide suitable conditions for the presence of this species; however site is very dry with the exception of the small artificial dam. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pilularia novae-hollandiae	Austral Pillwort	E1,P,3	-	Grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous.	K	Low. Site does not provide suitable habitat conditions for the presence of this species.	Low.
Callistemon linearifolius	Netted Bottle Brush	V,P,3	-	Grows in dry sclerophyll forest on the coast and adjacent ranges.	5	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Darwinia biflora		V,P	V	Occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. Associated overstorey species include Eucalyptus haemastoma, Corymbia gummifera and/or E. squamosa. The vegetation structure is usually woodland, open forest or scrub-heath.	K	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site.	Low.
Darwinia peduncularis		V,P		Usually grows on or near rocky outcrops on sandy, well drained, low nutrient soil over sandstone.	K	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Eucalyptus benthamii	Camden White Gum	V,P	V	Requires a combination of deep alluvial sands and a flooding regime that permits seedling establishment. Recruitment of juveniles appears to be most successful on bare silt deposits in rivers and streams.	5	Low. Site does not provide suitable habitat conditions for the presence of this species. Excepting the Georges River location, a natural riverine environment and associated flooding regime required by this species does not occur. This species was not identified on site.	Low.
Eucalyptus camfieldii	Camfield's Stringybark	V,P	V	Poor coastal country in shallow sandy soils overlying Hawkesbury sandstone. Coastal heath mostly on exposed sandy ridges.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V,P	V	Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock.	1	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Eucalyptus scoparia	Wallangarra White Gum	E1,P	V	In NSW it is known from only three locations near Tenterfield, including Bald Rock National Park. In Queensland it is equally rare, occurring at three sites of which only one has more than a dozen trees. Found in open eucalypt forest and woodland on well-drained granite hilltops, slopes and rocky outcrops, typically at high altitudes.	1	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Eucalyptus sp. Cattai		E1,P	-	Occurs as a rare emergent tree in scrub, heath and low woodland on sandy soils, usually as isolated individuals or occasionally in small clustered groups. The sites at which it occurs are generally flat and on ridge tops.	P	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Melaleuca biconvexa	Biconvex Paperbark	V, P	V	Biconvex Paperbark generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Melaleuca deanei	Deane's Paperbark	V, P	V	Occurs in two distinct areas, in the Ku-ring-gai/Berowra and Holsworthy/Wedderburn areas respectively. There are also more isolated occurrences at Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas. The species grows in heath on sandstone.	26	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pelargonium sp. Striatellum	Omeo Stork's-bill	E	E	It has a narrow habitat that is usually just above the high-water level of irregularly inundated or ephemeral lakes, in the transition zone between surrounding grasslands or pasture and the wetland or aquatic communities.	May occur within area	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Micromyrtus minutiflora		E1,P	V	Grows in Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open forest on tertiary alluvium and consolidated river sediments.	K	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Syzygium paniculatum	Magenta Lilly Pilly	E1, P	V	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Caladenia tessellata	Thick Lip Spider Orchid	E1,P,2	V	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	K	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Diuris aequalis	Buttercup Doubletail	E1,P,2	V	Recorded in forest, low open woodland with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range).	1	Low. Site does not provide suitable habitat conditions for the presence of this species. The site is highly degraded open woodland with little shrub/native grass cover. This species was not identified on site.	Low.
Genoplesium baueri	Bauer's Midge Orchid	E1,P,2	-	The species has been recorded at locations now likely to be within the following conservation reserves: Berowra Valley Regional Park, Royal National Park and Lane Cove National Park. May occur in the Woronora, O'Hares, Metropolitan and Warragamba Catchments. Grows in dry sclerophyll forest and moss gardens over sandstone.	1	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Pterostylis nigricans	Dark Greenhood	V,P,2	-	Coastal heathland with Heath Banksia (Banksia ericifolia), and lower-growing heath with lichen-encrusted and relatively undisturbed soil surfaces, on sandy soils.	1	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pterostylis saxicola	Sydney Plains Greenhood	E1,P,2	E	Most commonly found growing in small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines. The vegetation communities above the shelves where Pterostylis saxicola occurs are sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	7	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Deyeuxia appressa		E1,P	E	A highly restricted NSW endemic known only from two pre-1942 records in the Sydney area. Was first collected in 1930 at Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown. Was then collected in 1941 from Killara, near Hornsby. Given that D. appressa hasn't been seen in over 60 years, almost nothing is known of the species' habitat and ecology.	P	Low. As the conditions for the presence of this species are highly unknown it is difficult to assess whether the site is suitable habitat This species was not identified on site.	Low.
Persicaria elatior	Tall Knotweed	V,P	V	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	V,P	-	Recorded from Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest. Associated canopy species within Cumberland Plain Woodland and Shale/Gravel Transition Forest includeEucalyptus tereticornis, E. moluccana, E. crebra, E. fibrosa and E. eugenioides. Understorey species include Bursaria spinosa, Dillwynia sieberi, Ozothamnus diosmifolius, Daviesia ulicifolia, Acacia falcata, Acacia parramattensis, Themeda australis, Aristida ramosa, Cymbopogon refractus, Eragrostis brownii, Cheilanthes sieberi, Dianella revoluta and Goodenia hederacea.	1	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V,P	V	Occurs in a range of vegetation types from heath and shrubby woodland to open forest. In Sydney it has been recorded from Shale Sandstone Transition Forest and in the Hunter in Kurri Sand Swamp Woodland. However, other communities occupied include Corymbia maculata - Angophora costata open forest in the Dooralong area, in Sydney Sandstone Ridgetop Woodland at Wedderburn and in Cooks River / Castlereagh Ironbark Forest at Kemps Creek.	30	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site.	Low.
Hibbertia puberula subsp. glabrescens		CE	CE	Known only from Tertiary alluvial soil along Airport Creek on Bankstown Airport. The plant assemblage is attributable to Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion.	Likely to occur within area	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Grevillea parviflora subsp. supplicans		E1,P	-	Occurs in heathy woodland associations on skeletal sandy soils over massive sandstones. Has a very restricted known distribution (approximately 8 by 10 km) and is confined to the north-west of Sydney near Arcadia and the Maroota–Marramarra Creek area, in Hornsby and Baulkham Hills local government areas	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Persoonia bargoensis	Bargo Geebung	E1,P	V	Occurs in woodland or dry sclerophyll forest on sandstone and on heavier, well drained, loamy, gravelly soils of the Wianamatta Shale and .Hawkesbury Sandstone. Restricted to a small area south-west of Sydney on the western edge of the Woronora Plateau and the northern edge of the Southern Highlands.	K	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Persoonia glaucescens	Mittagong Geebung	E1,P	V	Grows in woodland to dry sclerophyll forest on clayey and gravely laterite. The preferred topography is ridge-tops, plateaux and upper slopes.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Persoonia hirsuta	Hairy Geebung	E1,P,3	E	Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	8	Low-moderate. The site may provide suitable conditions for the presence of this species. The site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Persoonia mollis subsp. maxima		E1,P	E	Occurs in sheltered aspects of deep gullies or on the steep upper hillsides of narrow gullies on Hawkesbury Sandstone. These habitats support relatively moist, tall forest vegetation communities, often with warm temperate rainforest influences.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Persoonia nutans	Nodding Geebung	E1,P	E	Northern populations are confined to aeolian and alluvial sediments and occur in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland and some in Cooks River / Castlereagh Ironbark Forests. Southern populations also occupy tertiary alluvium, but extend onto shale sandstone transition communities and into Cooks River / Castlereagh Ironbark Forest.	27	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Pomaderris brunnea	Brown Pomaderris	V,P	V	Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines. Flowers appear in September and October. Has been found in association with Eucalyptus amplifolia, Angophora floribunda, Acacia parramattensis, Bursaria spinosa and Kunzea ambigua.	2	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2	-	Known from only three sites within the listed local government areas, at Rydalmere, within Rookwood Cemetery and at The Crest of Bankstown. At Rydalmere it occurs along a road reserve near a creek, among grass species on sandstone. At Rookwood Cemetery it occurs in a small gully of degraded Cooks River / Castlereagh Ironbark Forest on shale soils.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Galium australe	Tangled Bedstraw	E1,P	-	In NSW (and ACT Territory in Jervis Bay), Tangled Bedstraw has been recorded in Turpentine forest and coastal Acacia shrubland.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Zieria involucrata		E1,P	V	Occurs primarily on Hawkesbury sandstone. Also occurs on Narrabeen Group sandstone and on Quaternary alluvium. Found primarily in sheltered forests on mid- to lower slopes and valleys, e.g. in or adjacent to gullies which support sheltered forest, although some populations extend upslope into drier vegetation. The canopy typically includes Turpentine, Smooth-barked Apple, Blue-leaved Stringybark and Forest Oak.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Thesium australe	Austral Toadflax	V,P	V	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Grows in association with *Themeda australis.*	K	Low-moderate. *Thesium australe* is a parasitic plant that grows in association with *Themeda australis. T australis* was identified within a small portion of the site. However, the area and condition of *T. australis* was not sufficient to support a population of this parasitic species. This species was not identified on site.	Low.
Lasiopetalum joyceae		V,P	V	Has a restricted range occurring on lateritic to shaley ridgetops on the Hornsby Plateau south of the Hawkesbury River. Grows in heath on sandstone.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Rulingia prostrata	Dwarf Kerrawang	E1,P	E	Occurs on sandy, sometimes peaty soils in a wide variety of habitats: Snow Gum Woodland and Ephemeral Wetland floor at Rowes Lagoon; Blue leaved Stringybark Open Forest at Tallong; and in Brittle Gum Low Open Woodland at Penrose; Scribbly Gum/ Swamp Mahogany Ecotonal Forest at Tomago. Associated native species may include Imperata cylindrica, Empodisma minus and Leptospermum continentale.	P	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pimelea curviflora var. curviflora		V,P	V	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Also recorded in Illawarra Lowland Grassy Woodland habitat at Albion Park on the Illawaraa coastal plain. Flowers October to May. Often grows amongst dense grasses and sedges. It can survive for some time without any foliage after fire or grazing.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Pimelea spicata	Spiked Rice-flower	E1,P	E	Found on well-structured clay soils. On the Cumberland Plain sites it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark. The co-occurring species in the Cumberland Plain sites are grey box, forest red gum and narrow-leaved ironbark. Blackthorn is often present at sites (and may be important in protection from grazing) and kangaroo grass is usually present in the groundcover.	19	Moderate. Site may provide suitable conditions for the presence of this species. Notwithstanding the targeted meander survey, there was no evidence of this species observed during the field surveys.	Low – not recorded on-site. The potential for impact on this species is further assessed through a seven part test in Appendix 7 See Appendix 8 for full species target report.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pomaderris brunnea	Rufous Pomaderris		V	Grows in open forest. Has been found in association with Eucalyptus amplifolia, Angophora floribunda, Acacia parramattensis, Bursaria spinosa and Kunzea ambigua. In the Sydney region this species is found typically near the coast, on Sydney Sandstones. In this area is grows in woodland and semi-cleared scrub, on clay and alluvial soils of floodplains and creek lines.	Likely to occur within area	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Zannichellia palustris		E1,P	-	Known from the lower Hunter and in Sydney Olympic Park. Grows in fresh or slightly saline stationary or slowly flowing water. Flowers during warmer months. NSW populations behave as annuals, dying back completely every summer.	K	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Asterolasia elegans		E	-	Occurs on Hawkesbury sandstone. Found in sheltered forests on mid- to lower slopes and valleys, e.g. in or adjacent to gullies which support sheltered forest. The canopy at known sites includes Turpentine, Smooth-barked Apple), Sydney Peppermint, Forest Oak and Christmas Bush.	Likely to occur within area	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Caladenia tessellate	Thick-lipped Spider-orchid, Daddy Long-legs	E1, P, 2	V	This species is endemic to mainland south-east Australia. Favours low, dry sclerophyll woodland with a heathy or sometimes grassy understorey on clay loams or sandy soils.	May occur within area	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered with very little shrub/native grass understorey. This species was not identified on site.	Low.
Cryptostylis hunteriana	Leafless Tongue-orchid	V, P, 2	V	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum, Silvertop Ash, Red Bloodwood and Black Sheoak; appears to prefer open areas in the understorey and is often found in association with the Large Tongue Orchid and the Tartan Tongue Orchid.	May occur within area	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site.	Low.

Scientific Name	Common Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Pterostylis gibbosa	Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood	E1, P, 2	E	In the Illawarra region, grows in woodland dominated by Forest Red Gum Eucalyptus tereticornis, Woollybutt E. longifolia and White Feather Honey-myrtle Melaleuca decora. Near Nowra, grows in an open forest of Spotted Gum Corymbia maculata, Forest Red Gum and Grey Ironbark E. paniculata. In the Hunter region, grows in open woodland dominated by Narrow-leaved Ironbark E. crebra, Forest Red Gum and Black Cypress Pine Callitris endlicheri.	Known to occur within area	Low-moderate. The site may provide suitable conditions for the presence of this species though the site is highly disturbed and vegetation greatly altered. This species was not identified on site	Low.
Streblus pendulinus	Siah's Backbone, Isaac Wood	-	E	On the Australian mainland, this species is found in warmer rainforests, primarily along watercourses. From near sea level to 800m above sea level. The species grows in well-developed rainforest, gallery forest and drier, more seasonal rainforests.	Likely to occur in the area	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.
Thelymitra sp. Kangaloon	Kangaloon Sun-orchid	CE	CE	Only known to occur on the southern tablelands of NSW in the Moss Vale / Kangaloon / Fitzroy Falls area at 550-700 m above sea level. It is found in swamps in sedgelands over grey silty grey loam soils	May occur within the area	Low. Site does not provide suitable habitat conditions for the presence of this species. This species was not identified on site.	Low.

Appendix 4

Ecological Community Assessment

Communities with a likelihood of occurrence of Moderate or greater have had potential impacts formally assessed using a 7-part test under the *Environmental Planning and Assessment Act 1979* and an EPBC Assessment where required (see Appendix 7).

Ecological communities recorded on the site are denoted by bold text.

E1 - Endangered; E2 - Endangered Population; E3 - Endangered ecological community; E4 Critically endangered; P - Protected; K - Known occurrence; PR - Predicted occurrence; V - Vulnerable; E4 critically endangered

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Agnes Banks Woodland in the Sydney Basin Bioregion	E3	-	Occurs in western Sydney, mostly near Agnes Banks on the east bank of the Hawkesbury River, in the Penrith local government area. Occurs on areas of wind-blown sand which overlay Tertiary Alluvium deposits from ancient river systems. Depending on drainage conditions, there is great variation within the community, from low woodland on higher ridges to sedge-type vegetation in low lying depressions.	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions	E3	-	Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions typically has a dense to open tree canopy, approximately 5 - 20m tall. The most common tree species include Bangalay (Eucalyptus botryoides) and Coast Banksia (Banksia integrifolia subsp. integrifolia), while Blackbutt (Eucalyptus pilularis) and Lilly Pilly (Acmena smithii) may occur in more sheltered situations, and Swamp Oak (Casuarina glauca) may occur on dunes exposed to salt-bearing sea breezes or where Bangalay Sand Forest adjoins Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions.	K	Low. This site is not representative of this EEC	Low.
Blue Gum High Forest in the Sydney Basin Bioregion	E4B	CE	The remnants mainly occur in the Lane Cove, Willoughby, Ku-ring-gai, Hornsby, Baulkham Hills, Ryde and Parramatta LGAs. Occurs only in areas where rainfall is high (above 1100mm/year) and the soils are relatively fertile and derived from Wianamatta shale. In lower rainfall areas, it grades into Sydney Turpentine-Ironbark Forest. The community also occurs on soils associated with localised volcanic intrusions, 'diatremes'.	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	E3	CE	Found on deep fertile soils formed on Wianamatta Shale, on moist sheltered sites at lower to middle altitudes of the Blue Mountains and Wollemi areas. Extensive occurrences of shale are at Springwood, Berambing to Kurrajong Heights, Mountain Lagoon and Colo Heights. Includes vegetation that is part of Map Unit 9a Shale Cap Forest of the Royal Botanic Gardens' 1:100 000 vegetation maps and vegetation that is part of Smith and Smith's Eucalyptus deanei–Syncarpia glomulifera Tall Open Forest. Is a rich habitat for fauna. The Eucalyptus deanei trees are a major provider of nest hollows for owls, parrots, gliders and other hollow dependent fauna including the threatened species Powerful Owl and Glossy Black-Cockatoo.	K	Low. This site is not representative of this EEC	Low.
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V2	-	Occurs almost exclusively on soils derived from Tertiary alluvium, or on sites located on adjoining shale or Holocene alluvium. The shrub understorey includes a number of listed threatened species including Acacia bynoeana, Allocasuarina glareicola, Dillwynia tenuifolia, Grevillea juniperina subsp. juniperina, Micromyrtus minutiflora, Persoonia nutans and Pultenaea parviflora, and may also possibly contain Grevillea parviflora subsp. Parviflora.	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Castlereagh Swamp Woodland Community	E3	-	Occurs in western Sydney in the Castlereagh and Holsworthy areas, on deposits from ancient river systems along today's intermittent creeklines, often in poorly drained depressions. Highly adapted to seasonal fluctuations of wet and dry. Intergrades into Ironbark and Scribbly Gum woodland and is subject to periodic fires.	K	Low. This site is not representative of this EEC	Low.
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	V	Coastal Saltmarsh occurs in the intertidal zone on the shores of estuaries and lagoons that are permanently or intermittently open to the sea. Characteristic plants include Baumea juncea, Sea Rush (Juncus krausii subsp. australiensis), Samphire (Sarcocornia quinqueflora subsp. quinqueflora), Marine Couch (Sporobolus virginicus), Streaked Arrowgrass (Triglochin striata), Knobby Club-rush (Ficinia nodosa), Creeping Brookweed (Samolus repens), Swamp Weed (Selliera radicans), Seablite (Suaeda australis) and Prickly Couch (Zoysia macrantha).	P	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Coastal Upland Swamp in the Sydney Basin Bioregion	E3	-	The Coastal Upland Swamp is endemic to NSW and confined to the Sydney Basin Bioregion. Occurs primarily on impermeable sandstone plateaux with shallow groundwater aquifers in the headwaters and impeded drainage lines of streams, and on sandstone benches with abundant seepage moisture. Generally associated with soils that are acidic and vary from yellow to grey mineral sandy loams with a shallow organic horizon to highly organic spongy black peats with pallid subsoils.	K	Low. This site is not representative of this EEC	Low.
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E3	-	Has a very restricted natural distribution and mainly occurs on clay soils derived from the deposits of ancient river systems (alluvium), or on shale soils of the Wianamatta Shales. Can intergrade into Shale-Gravel Transition Forest (where the alluvium is shallow), Castlereagh Swamp Woodland (in moist depressions) and Castlereagh Scribbly Gum Woodland (on sandier soils).	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Cumberland Plain Woodland in the Sydney Basin Bioregion	E4B	CE	Occurs on soils derived from Wianamatta Shale, and throughout the driest part of the Sydney Basin. Typically occurs on heavy clay soils derived from Wianamatta Shale. Cumberland Plain Woodland is habitat for threatened species such as the Cumberland land snail (Meridolum corneovirens).	K	High. Site is suitable species composition for the presence of this EEC. This community occurs on the site in a modified form.	The potential for impact on this community is further assessed in Appendix 7. A separate community specific assessment report has been prepared by SLR Consulting (see Appendix 15).

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Elderslie Banksia Scrub Forest	E3	-	Unique as includes plants, such as coastal Banksia and other sandstone region species, which do not occur in the surrounding Cumberland Plain communities. Occurs only on sand deposits on the old terraces deposited by ancient river systems of what is now the Nepean River, and requires deep sand soil to fully regenerate. Intergrades with Cumberland Plain Woodland and river-flat forest communities.	K	Low. This site is not representative of this EEC	Low.
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	-	Typically occurs on silts, muds or humic loams in low-lying parts of floodplains, alluvial flats, depressions, drainage lines, backswamps, and lagoons. They are dominated by herbaceous plants and have very few woody species. Generally occur below 20m elevation on level areas. Those that lack standing water most of the time are usually dominated by dense grassland or sedgeland vegetation, often forming a turf less than 0.5 metre tall and dominated by amphibious plants. Where they are subject to regular inundation and drying the vegetation may include large emergent sedges over 1 metre tall.	K	Low. This site is not representative of this EEC. The constructed dam is not considered to form an example of this community as it is artificial in nature. Refer to Appendix 15 for additional explanation.	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Kurnell Dune Forest in the Sutherland Shire and City of Rockdale	E3	-	Occurs on coastal dune sand. Can be differentiated from the Eastern Suburbs Banksia Scrub (ESBS) endangered ecological community by the following features: Kurnell Dune Forest (KDF) contains a considerable mesomorphic element in the flora, which is absent or less dominant in ESBS; KDF has a forest structure rather than the predominantly scrub structure of ESBS; and KDF occurs on younger sands than those of ESBS.	K	Low. This site is not representative of this EEC	Low.
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	CE	The plant species of this community are predominantly rainforest species. Several species have compound leaves, and vines may be a major component of the canopy. These features differentiate littoral rainforest from forest or scrub, but while the canopy is dominated by rainforest species, scattered emergent individuals of sclerophyll species, such as Angophora costata, Banksia integrifolia, Eucalyptus botryoides and Eucalyptus tereticornis occur in many stands. The Sutherland Shire Littoral Rainforest Endangered Ecological Community which was listed previously as an endangered ecological community is included within this community.	P	Low. This site is not representative of this EEC.	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Moist Shale Woodland in the Sydney Basin Bioregion	E3	CE	Usually occurs on soils derived from Wianamatta Shale on high country in the southern half of the Cumberland Plain, and occurs mainly in Wollondilly LGA. Also occurs in smaller amounts further north in the Camden, Campbelltown, Fairfield, Liverpool and Penrith LGAs. Mainly occurs in the hilly country with higher elevations where there is increased rainfall. Occurs on clay soils derived from Wianamatta shale and is intermediate between Cumberland Plain Woodland on drier sites and Western Sydney Dry Rainforest on wetter sites.	K	Low-moderate. The site has characteristics of this EEC. However, field surveys and in-depth reporting have concluded that this EEC is not present on site.	Low.
O'Hares Creek Shale Forest	E3	-	Forms part of a network of vegetation communities that occupy the remnant shales soils that lie above the sandstone plateau. The community is a component of the more broadly occurring Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateau, Sydney Basin community. Trees within the community are distinctively taller than those in the surrounding sandstone woodland vegetation. Locations on the Darkes Forest ridge typically have a more mesic understorey than sites on the smaller shale outcrops further west. The community persists within a narrow mean annual rainfall band of between 950mm and 1100mm and between elevations of 350 and 450 metres above sea level.	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	**E3**		**Found on the river flats of the coastal floodplains. It has a tall open tree layer of eucalypts, (may exceed 40m), but can be considerably shorter in regrowth stands or under conditions of lower site quality. While the composition of the tree stratum varies considerably, the most widespread and abundant dominant trees include Eucalyptus tereticornis (forest red gum), E. amplifolia (cabbage gum), Angophora floribunda (rough-barked apple) and A. subvelutina (broad-leaved apple). Eucalyptus baueriana (blue box), E. botryoides (bangalay) and E. elata (river peppermint) may be common south from Sydney, E. ovata (swamp gum) occurs on the far south coast.**	**K**	**High – this community occurs on-site along the banks of the Georges River.**	**Low. The potential for impact on this community is further assessed through a seven part test due to its presence on the site.**
Shale gravel Transition Forest in the Sydney Basin Bioregion	E3	CE	Occurs primarily where shallow deposits from ancient river systems overlay shale soils, but also associated with localised concentrations of iron-hardened gravel. A transitional plant community which grades into Cumberland Plain Woodland where the influence of gravel soil declines, and grades into Cooks River/Castlereagh Ironbark Forest or Castlereagh Scribbly Gum Woodland where gravel deposits are thick. The shrub understorey includes a number of listed threatened species in the 'pea' flower group.	K	Low-moderate. The site has characteristics of this EEC. However, field surveys and in-depth reporting have concluded that this EEC is not present on site.	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Shale/Sandstone Transition Forest	E3	E	Some species in areas with greater shale influence regenerate from profuse annual seeding and underground tubers. High-sandstone-influence sites have poor rocky soils, and many shrubs which rely on nitrogen-fixing root nodules and soil/root fungi to obtain nutrients. High-shale-influence sites often have a diverse and moderately dense groundcover stratum, with grasses a prominent and diverse component. Shrubs are usually less abundant and less diverse in shale sites.	K	Low. This site is not representative of this EEC	Low.
Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	E3	-	The terrain is primarily gentle, with slopes not often exceeding 10°, and where sandstone outcrops occur infrequently. The community is typically associated with sheltered heads and upper slopes of gullies on transitional zones where sandstone outcrops may exist, but where soils are influenced by lateral movement of moisture, nutrients and sediment from more fertile substrates.	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	-	This community is found on the coastal floodplains of NSW. It has a dense to sparse tree layer. Tree diversity decreases with latitude, and Melaleuca ericifolia is the only abundant tree in this community south of Bermagui. The understorey is characterised by frequent occurrences of vines, Parsonsia straminea, Geitonoplesium cymosum and Stephania japonica var. discolor, a sparse cover of shrubs, and a continuous groundcover of forbs, sedges, grasses and leaf litter.	K	Low. This site is not representative of this EEC	Low.
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	-	This swamp community has an open to dense tree layer of eucalypts and paperbarks although some remnants now only have scattered trees as a result of partial clearing. The community also includes some areas of fernland and tall reedland or sedgeland, where trees are very sparse or absent. The most widespread and abundant dominant trees include Eucalyptus robusta (swamp mahogany), Melaleuca quinquenervia (paperbark) and, south from Sydney, Eucalyptus botryoides (bangalay) and Eucalyptus longifolia (woollybutt).	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Sydney Freshwater Wetlands in the Sydney Basin Bioregion	E3	-	Occurs on sand dunes and low-nutrient sandplains along coastal areas in the Sydney Basin bioregion. Largely restricted to freshwater swamps in swales and depressions on sand dunes and low nutrient sandplains such as those of the Warriewood and Tuggerah soil landscapes. Swampy areas on alluvium with a saline influence do not fall within this community.	K	Low. This site is not representative of this EEC	Low.
Sydney Turpentine-Ironbark Forest	E3	CE	Occurs in Sydney and is heavily fragmented. Occurs close to the shale/sandstone boundary on the more fertile shale influenced soils, in higher rainfall areas on the higher altitude margins of the Cumberland Plain, and on the shale ridge caps of sandstone plateaus. A transitional community, between Cumberland Plain Woodland in drier areas and Blue Gum High Forest on adjacent higher rainfall ridges.	K	Low. This site is not representative of this EEC	Low.
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E3	-	Themeda australis is the dominant species in the Themeda Grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner bioregion ecological community. Banksia integrifolia subsp. integrifolia, Westringia fruticosa and Acacia sophorae occurs as an emergent shrub or as a dense cover where they have recruited over grasslands.	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	E3	CE	Very restricted and occurs most commonly in the far southern section of the Cumberland Plain, in the Razorback Range near Picton. Occurring to a lesser extent in the Baulkham Hills, Camden, Hawkesbury, Parramatta and Ryde LGAs. Restricted to hilly country where it occurs on the sheltered lower slopes and in gullies. Generally found at higher elevation, in areas receiving higher rainfall than much of the Cumberland Plain Woodland. Occurs on clay soils derived from Wianamatta shale. Several species of plants (including Spartothamnella juncea and rare and threatened such as Marsdenia viridiflora) have their southern distribution limit within areas of Western Sydney Dry Rainforest.	K	Low. This site is not representative of this EEC	Low.

Community Name	NSW status	Comm. status	Habitat Description	Records	Likelihood of occurrence	Potential Impacts
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	-	E	Generally tall open eucalypt forests found on igneous rock (predominately Tertiary basalt and microsyenite) in, or adjacent to, the Sydney Basin Bioregion. The ecological community occurs in areas of high rainfall, generally ranging from 950 to 1600 mm/year. The ecological community typically occurs at elevations between 650 and 1050 m above sea level. The ecological community typically occurs as an open to tall open forest with a sparse to dense layer of shrubs and vines, and a diverse understorey of native grasses, forbs, twiners and ferns. However, the structure of the ecological community may vary from tall open forest with trees up to and above 30 m tall with a projected foliage cover of 30–70% to woodland with trees 10–30 m tall, with a projected foliage cover of 10–30%.	P	Low. This site is not representative of this EEC	Low.

Appendix 5

Key Threatening Process (KTP) Assessment

Key Threatening Process	NSW status	Comm. status	Likelihood of occurrence	Potential Impacts
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala*	KTP		Low. Proposal will not exacerbate this KTP further.	Low.
Alteration of habitat following subsidence due to longwall mining	KTP		Low. No longwall mining occurring	Low.
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP		Low. No alteration to natural hydrological regimes will occur.	Low.
Anthropogenic Climate Change	KTP	KTP	Low - Moderate. The project will have a minor contribution to overall greenhouse gas emission during construction. However, this will be quite small.	Low.
Bushrock removal	KTP		Low. No bushrock on site.	Low.
Clearing of native vegetation	KTP	KTP	Low-moderate. The project will result in a comparatively minor contribution to this KTP, with some clearing being unavoidable as part of the future development of the GWS site.	Moderate.
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)	KTP	KTP	Low. The proposal will not exacerbate the competition and grazing by rabbits.	Low.
Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758	KTP	KTP	Low. The proposal will not exacerbate the competition and grazing by goats.	Low.

Key Threatening Process	NSW status	Comm. status	Likelihood of occurrence	Potential Impacts
Competition from feral honey bees, *Apis mellifera* L.	KTP		Low. The proposal will not exacerbate the competition by feral honeybees.	Low.
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP		Low. The proposal will not provide further habitat for Bell Miners.	Low
Herbivory and environmental degradation caused by feral deer	KTP		Low. The proposal will not exacerbate herbivory by feral deer.	Low.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP		Low. The proposal will not include high frequency fire management.	Low.
Importation of Red Imported Fire Ants *Solenopsis invicta* Buren 1972	KTP		Low. The proposal does not include importing fire ants.	Low.
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP	KTP	Low. The proposal does not expect to transmit bird diseases.	Low.
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP	Low. The proposal does not expect to transmit this disease.	Low.
Infection of native plants by *Phytophthora cinnamomi*	KTP	KTP	Low-moderate. The proposal may facilitate the transmission of plant diseases through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.

Key Threatening Process	NSW status	Comm. status	Likelihood of occurrence	Potential Impacts
Introduction of the Large Earth Bumblebee *Bombus terrestris* (L.)	KTP		Low. The proposal does not include importing bees or any associated activities that could cause introduction of bees.	Low.
Invasion and establishment of exotic vines and scramblers	KTP		Low - Moderate. The proposal may facilitate the transmission of plant parts through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	KTP		Low - Moderate. The proposal may facilitate the transmission of plant parts through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.
Invasion and establishment of the Cane Toad (*Bufo marinus*)	KTP	KTP	Low. The proposal will not involve the transportation of frogs.	Low.
Invasion of native plant communities by African Olive *Olea europaea* L. subsp. *cuspidata* (Wall ex G. Don Cirferri)	KTP		Low - Moderate. The proposal may facilitate the transmission of plant parts through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.
Invasion of native plant communities by *Chrysanthemoides monilifera*	KTP		Low - Moderate. The proposal may facilitate the transmission of plant parts through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.
Invasion of native plant communities by exotic perennial grasses	KTP		Low - Moderate. The proposal may facilitate the transmission of plant parts through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.

Key Threatening Process	NSW status	Comm. status	Likelihood of occurrence	Potential Impacts
Invasion of the Yellow Crazy Ant, *Anoplolepis gracilipes* (Fr. Smith) into NSW	KTP		Low. The proposal does not include importing fire ants or any associated activities that could lead to the invasion of yellow crazy ants.	Low.
Invasion, establishment and spread of Lantana (*Lantana camara* L. sens. Lat)	KTP		Low - Moderate. The proposal may facilitate the transmission of plant parts through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP	Low - Moderate. The proposal may facilitate the transmission of plant parts through machinery transportation during construction.	Low. Ensure equipment hygiene protocols are followed.
Loss of Hollow-bearing Trees	KTP		Moderate. Trees containing hollows will need to be removed. The amount to be removed will need to be considered in the overall site redevelopment.	Moderate. A hollow bearing tree assessment has been conducted on site revealing a total of 28 trunk hollows, 81 branch hollows and 1 old termite nest within the GWS site. Nest boxes are proposed to be erected at a 2:1 ratio for each individual hollow proposed for removal and to be placed within the riparian areas on the eastern portion of the site to provide potential nesting/breeding habitat for any common or threatened species likely to occur within the area, particularly threatened Microchiropteran bats.
Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP		Low. The proposal will occupy only a small area and is unlikely to exacerbate this KTP.	Low.

Key Threatening Process	NSW status	Comm. status	Likelihood of occurrence	Potential Impacts
Predation and hybridisation by Feral Dogs, *Canis lupus familiaris*	KTP		Low. The proposal is unlikely to enhance this KTP.	Low.
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP		Low. The subject site is not a waterway.	Low.
Predation by the European Red Fox *Vulpes Vulpes* (Linnaeus, 1758)	KTP	KTP	Low. The proposal is unlikely to enhance this KTP.	Low.
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)	KTP	KTP	Low. The proposal is unlikely to enhance this KTP.	Low.
Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758	KTP	KTP	Low. The proposal is unlikely to enhance this KTP.	Low.
Removal of dead wood and dead trees	KTP		Low. A small number of trees (approx. 3) contain dead wood and may potentially require removal, however, this small amount is not considered to exacerbate this KTP.	Low.

Appendix 6

Invasive Species Assessment

Scientific Name	Common Name	NSW status	Comm. status	Assessment
Acridotheres tristis	Common Myna, Indian Myna	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Alauda arvensis	Skylark	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Anas platyrhynchos	Mallard	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Carduelis carduelis	European Goldfinch	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Carduelis chloris	European Greenfinch	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Columba livia	Rock pigeon	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Lonchura punctulata	Nutmeg Mannikin	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Passer domesticus	House Sparrow	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Passer montanus	Eurasian Tree Sparrow	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Pycnonotus jocosus	Red-whiskered Bulbul	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Streptopelia chinensis	Spotted Turtle-Dove	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Sturnus vulgaris	Common starling	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Turdus merula	Common blackbird	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Bufo marinus	Cane Toad	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Rhinella marina	Cane Toad	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Bos Taurus	Domestic cattle	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Canis lupus familiaris	Domestic Dog	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP

Scientific Name	Common Name	NSW status	Comm. status	Assessment
Felis catus	Cat	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Mus musculus	House Mouse	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Oryctolagus cuniculus	Rabbit	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Feral Deer	Deer	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Lepus capensis	Brown Hare	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Rattus norvegicus	Brown Rat	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Rattus rattus	Black rat	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Vulpes vulpes	Fox	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Hemidactylus frenatus	Asian House Gecko	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Alternanthera philoxeroides	Alligator Weed	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Anredera cordifolia	Madeira Vine	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Asparagus aethiopicus	Asparagus Fern	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Asparagus asparagoides	Bridal Creeper	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Chrysanthemoides monililfera	Bitou Bush	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Asparagus plumosus	Climbing Asparagus-fern	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Asparagus scandens	Asparagus Fern	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Cabomba caroliniana	Cabomba	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Chrysanthemoides monilifera subsp. Monilifera	Boneseed	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP

Scientific Name	Common Name	NSW status	Comm. status	Assessment
Chrysanthemoides monilifera subsp. rotundata	Bitou Bush	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Eichhornia crassipes	Water Hyacinth, Water Orchid	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Genista linifolia	Flax-leaved Broom	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Genista sp. x Genista monspessulana	Broom	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Dolichandra unguis-cati	Cat's Claw Vine	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Lantana camara	Lantana	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Lycium ferocissimum	African Boxthorn	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Nassella neesiana	Chilean Needle Grass	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Nassella trichotoma	Serrated Tussock	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Opuntia spp.	Prickly Pears	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Pinus radiata	Radiata Pine	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity

Scientific Name	Common Name	NSW status	Comm. status	Assessment
				is considered unlikely to exacerbate this KTP
Protasparagus plumosus	Climbing Asparagus-fern,	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Rubus fruticosus aggregate	Blackberry	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Sagittaria platyphylla	Delta Arrowhead	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii	Willows	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Senecio madagascariensis	Fireweed	-	Invasive Species	We have recommended equipment wash-down and hygiene protocol and as such the proposed activity is considered unlikely to exacerbate this KTP
Salvinia molesta	Salvinia	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP
Ulex europaeus	Gorse, Furze	-	Invasive Species	Proposed activity unlikely to exacerbate this KTP

Appendix 7

Commonwealth and State Impact Assessments

A7.1 Commonwealth Assessment

Two Matters of National Environmental Significance were recorded on the site, being Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest and Grey-headed Flying Fox. Species such as Koala, Green and Golden Bell Frog and *Pimelea spicata* were not recorded despite detailed targeted searches in the correct seasons. No other species or communities listed under the EPBC Act were considered to warrant detailed impact assessments, other than the two recorded entities.

Impact assessments in accordance with the Significant Impact Guidelines 1.1 (2013) are therefore provided below for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest and Grey-headed Flying Fox.

Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- ***reduce the extent of an ecological community***

SLR (2014) (Appendix 16) shows that the total area of this community on the site is 13.77ha. Of this, 13.14ha is in very low to low condition and 0.63ha is in moderate condition. The area of woodland (in various conditions) to be removed by the combined impact of the SSD and rezoning will be approximately 9.5ha.

- ***fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines***

The existing patch of this community on the GWS is highly degraded and already partially isolated and fragmented from larger tracts of vegetation within the locality. The removal of this patch of Shale Plains Woodland vegetation will increase fragmentation within the site itself and the areas to be retained will be smaller and more spread out than is currently the case.

- ***adversely affect habitat critical to the survival of an ecological community***

The majority of this community will be removed as a result of the GWS projects.

- ***modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns***

The majority of this community will be removed as a result of the GWS projects.

- ***cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting***

The majority of this community will be removed as a result of the GWS projects.

- ***cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:***
    - ***assisting invasive species, that are harmful to the listed ecological community, to become established, or***
    - ***causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or***

The majority of this community will be removed as a result of the GWS projects.

- ***interfere with the recovery of an ecological community.***

The majority of this community will be removed as a result of the GWS projects.

Conclusion

It is considered that, while the vegetation to be impacted is in relatively low condition, the impacts of the SSD and rezoning would result in a controlled action due to the removal of over 9ha of this community. A Referral to DoE is therefore recommended in relation to the impacts to the threatened community.

Grey-headed Flying Fox

Specifically in relation to this species, the DoE has prepared two guidelines, being:

- Draft EPBC Act Policy Statement: Camp management guidelines for the Grey-headed and Spectacled flying-fox (2014)
- EPBC Act Administrative Guidelines on Significance - Supplement for the Grey-headed Flying-fox (2003)

Both of those documents generally tend to focus on impacts to "camps", where this species congregate in known important areas. No permanent camp is known to occur on the site or considered likely. The nearest known camp is located approximately 3.5km to the south at Macquarie Fields and the Commonwealth DoE has identified that the Macquarie Fields camp is Nationally Important.

Single flying foxes were recorded foraging in the woodland near the dam in February 2015. Such records indicate that the remnant vegetation is likely to be used as part of the greater foraging range of this highly mobile species. This species has not been previously recorded during the numerous previous surveys.

The factors requiring consideration for this species under the EPBC Act are addressed hereunder.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- ***lead to a long-term decrease in the size of an important population of a species***

It is considered unlikely that the removal of the majority of the remnant woodland from the site would lead to a long-term decrease in an important population. Extensive foraging habitat for this species occurs throughout the nearby Holsworthy defence site and this is likely to be retained in perpetuity, along with habitats in National Parks such as Royal National Park.

- ***reduce the area of occupancy of an important population***

It is considered than an important population is not likely to be reduced as a result of the projects, due to the persistence of extensive foraging habitats in the locality.

- ***fragment an existing important population into two or more populations***

This species is highly mobile and it is not considered that the projects would fragment any important populations.

- ***adversely affect habitat critical to the survival of a species***

It is not considered that any habitat critical to the survival of the species occurs on the site.

- ***disrupt the breeding cycle of an important population***

Disruptions of breeding of an important local population is unlikely to occur.

- ***modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline***

The impacts of the project are not likely to result in the decline of this species.

- ***result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat***

This is not considered to be a relevant consideration for this species.

- ***introduce disease that may cause the species to decline, or***

The projects are not likely to result in introduction of disease to this species.

- ***interfere substantially with the recovery of the species.***

The projects are not likely to interfere substantially with the recovery of this species.

Conclusion

It is considered unlikely that the projects would either impact on a known important camp or impact on an important population. An EPBC Referral is not considered to be necessary specifically for this species alone.

A7.2 State Assessment

Considerations of the effects of the proposed development under the guidelines of Section 5A of the *Environmental Planning and Assessment Act 1979 (EPA Act 1979)* for threatened species, populations and / or ecological communities considered to have a greater than moderate likelihood of occurrence (see Appendices 3-4 for likelihood of occurrence assessment) are given below. For the purposes of the Seven-Part Test, where appropriate, threatened species have been grouped into functional 'guilds' based on similar habitat or ecological requirements.

The following Seven-Part Tests have been completed (those recorded on-site are in bold text):

Threatened Ecological Communities

Cumberland Plain Woodland
River-Flat Eucalypt Forest on Coastal Floodplains

Fauna

Phascolarctos cinereus	Koala
Litoria aurea	Green and Golden Bell Frog
Meridolum corneovirens	Cumberland Plain Land Snail
Pteropus poliocephalus	**Grey-headed Flying-fox**

Hollow/shelter dependent microbats

Saccolaimus flaviventris	**Yellow-bellied Sheathtail-bat**
Mormopterus norfolkensis	**East-coast Freetail-bat**
Scoteanax rueppellii	Greater Broad-nosed Bat
Falsistrellus tasmaniensis	Eastern False Pipistrelle
Miniopterus australis	**Little Bentwing bat**
Miniopterus schreibersii oceanensis	**Eastern Bentwing bat**
Myotis macropus	Large-footed myotis

Flora

Pimelea spicata	Spiked Rice-flower

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Not applicable.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

The Shale Plain Woodland (Critically Endangered Ecological Community) is present on site in the southern portion of the GWS site. This community has been surveyed and is the subject of a Cumberland Plain Woodland Assessment Report completed by SLR Consulting (Appendix 15). From this report a map was created (Figure 7 in Appendix 15) to delineate the vegetated portion of the site and determine its overall condition status.

Further refinement of this mapping, including additional field work was undertaken by SLR and is contained in Appendix 16. The additional field work included BioBanking plots and determination of the condition of the Cumberland Plain Woodland with reference to the BioBanking condition parameters. This additional work identified that the total area of this community on the site is 13.77ha. Of this, the area of woodland (in various conditions) to be removed by the combined impact of the SSD and rezoning will be approximately 9.5ha.

There are a number of factors to be considered when determining whether the proposed action is likely to have an adverse effect on the extent of this community such that its local occurrence is likely to be placed at risk of extinction. The factors to consider include the following:

Fragmentation of the site

The GWS site is bound by a number of barriers to fauna movement, including Cambridge Avenue to the south, the Main Southern passenger railway, and the Southern Sydney Freight Lines to the west, East Hills Railway Line, which traverses the site in an east-westerly direction dividing the site into north and south parcels of land, Georges River along the eastern side, the landfill, quarry, and recycling operational areas together with the internal roads within the GWS precinct. The site and surrounding lands to the north, east, west and south (within 10km and excluding the south east) are also subject to disturbance as they are urban areas with isolated parcels of vegetative areas in the broader landscape. The land to the south east within 10km is a vast vegetated area and part of the Holsworthy Military Area under ownership of the Commonwealth. These urban and physical barriers reduce the potential movement of small and larger terrestrial (flightless) mammals into and through the Shale Plain Woodland in the southern portion of the site. The more mobile mammal bird and bat species are more likely to have access to the site and may use the site on occasion as part of a larger home range. Larger terrestrial mammals that may occur in the locality are likely to be excluded from much of the study area due to the physical barriers surrounding and within the site, with a major concern being the potential movement of these larger mammals across these barriers potentially leading to fatalities or injuries from cars, trains etc.

Habitat connectivity within the study area appears the greatest within the riparian vegetation associated with Georges River on the eastern side of the site, which maintains connectivity with riparian vegetation to the north and south. This riparian corridor could facilitate the movement of less mobile species, including cover-dependent species, larger terrestrial mammals and arboreal mammals. It is the intention that in conjunction with the proposed development, this connecting strip of riparian vegetation may be rehabilitated including the removal of weeds and the establishment of nesting boxes for use by hollow dependent fauna.

South east of the investigation area to the east of the Georges River is the adjacent Holsworthy Military Area. This site support approximately 18,000 hectares of continuous native vegetation that is part of a larger major contiguous vegetated area of approximately 140,000ha that continues from the site south to between Bowral and Wollongong. The diversity of vegetation communities within the Military Area and beyond includes forests, woodlands, heath and swamp communities, which in turn provide important habitat to locally and regionally occurring, threatened flora and fauna species. Highly mobile fauna species such as birds and some mammals may predominantly reside within the Holsworthy Military Area and utilise the limited resources offered by the study area on a temporary or transient basis.

The overall condition of the woodland

The studies conducted by SLR have determined that there are varying degrees of disturbances to the understorey and groundcover through the CPW area, resulting in areas of 'Very Low', 'Low' and 'Moderate' condition vegetation being mapped on the site. BioBanking Assessment work in Appendix 16 identified that the total area of this community on the site is 13.77ha. Of this, the area of woodland (in various conditions) to be removed by the combined impact of the SSD and rezoning will be approximately 9.5ha. It has been stated by SLR Consulting in their 2013 report that the areas which constitute the CPW community can broadly be described as moderately to highly disturbed, and have been for a considerable period of time.

Previous clearing and continued/historical maintenance of the ground layer

The Glenfield Waste Site has been in single family ownership since the 1800's with the understorey and groundcover being continually maintained for a number of purposes over that period. From aerial photography (Appendix 17) (AHMS 2012) dating back to the 1930's it is clear that the GWS was used for orchards and general farming practices. In photographs dating from the 1950's through to the 1970's it is evident that the woodland portion of the site has had the understorey and groundcover managed. In anecdotal conversations with the landowners regarding the historical management much of the site, including the woodland portion, has been used for grazing of livestock, general agricultural purposes and more recently also managed by slashing. Since the 1980s, under relevant development consents, a large portion of the GWS site has been previously cleared of native vegetation for the purpose of operating as a quarry and waste facility. Vegetation on the GWS site is primarily restricted to the Georges River riparian land and approximately 12.6ha of woodland vegetation located on the southern parcel of land in the Campbelltown LGA. As a result of continual management over the last century the ground layer grass and forb species composition has degraded across much of the site.

Lack of evidence of key fauna species present within the CPW community

In 2006, Eco Logical prepared a preliminary ecological assessment of the GWS with a total of 23 fauna species (birds) recorded with no threatened species observed as part of the survey. Subsequent surveys of the site were conducted by EPS ecologists in 2012, 2013, 2014 and again in 2015. The only threatened species recorded were highly mobile bats that can utilise disturbed habitats. Other species of flora and fauna recorded were those adapted to disturbed habitats. No species requiring large and structurally intact forested habitats were recorded.

Occurrence of this community in the local area

In combination with the vegetation within the Holsworthy Military Area to the south east of the site there are also a number of corridors of vegetation to the south and south-east of the site mapped in OEH SixViewer as CPW community. The GWS may have small areas of mapped 'Low-moderate' condition CPW; however, in the broader landscape this area is generally highly degraded and is unlikely to be preferred habitat considering the corridors of suitable vegetation in the broader landscape.

The GWS contains a small portion of Shale Plain Woodland which has been documented throughout this report as being in fairly low condition and also partially isolated and fragmented from larger patches of this community type in the local area, however this patch of vegetation does form part of a larger contiguous area of the overall ecological community and there is the potential for the movement of flora and fauna species, and therefore the exchange of genetic material across the boundary of the study site.

In determining the risk of extinction to the local occurrence of this CEEC, the proposed action is not likely to have an adverse effect on the extent of this community such that its local occurrence is likely to be placed at risk of extinction in the short term due to the direct actions of clearing this vegetation.

However, it cannot be assumed that the proposed actions will not potentially contribute to the extinction of this community in the long term through any number of indirect actions (beyond the control of this development) in the years to come. The Cumberland Plain Woodland Recovery Plan has been developed as a strategy to effectively manage those areas of the woodland that are considered of greatest significance and relevance to the continued existence of this community within the locality and broader Sydney Basin Bioregion. The site does not form part of the Cumberland Plain Woodland Recovery Plan Priority Conservation Areas.

(d) in relation to the habitat of a threatened species, population or ecological community:

> ***(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and***

In relation to the ecological community present on site, being Shale Plains Woodland the area of woodland to be removed will be approximately 9.5ha (2.58 low condition and 6.91 moderate to good condition). The following table and three figures below provide quantitative information that shows how the Shale Plains Woodland relates to representative CPW community in the wider locality. Within a radius of 2km from the GWS site Shale Plains Woodland comprises 54.6ha with 9.5ha of this on the GWS and proposed for removal which equates to 17% of the total area of this community within 2km radius and 45.1ha remaining within this area (Figure 1).

Within a radius of 5km there is a total of 256.3ha of Shale Plains Woodland and removal of the required 9.5 ha for the proposed development equates to a total of 3.7% of the total area of this community with an area of 246.5ha then remaining within this broader locality (Figure 2). The figures have not been accurately calculated for the 10km radius as shown in Figure 3; however from calculated estimates it is determined that the total area of Shale Plains Woodland is approximately double the area of hectares as calculated for the 5km radius.

Table 1: Hectares and % Shale Plain Woodland in the GWS Locality

	2km		5km	
	Total area (ha)	**% GWS**	**Total area (ha)**	**% GWS**
Shale Plains Woodland	54.6		256.3	
Less GWS	9.5	17%	9.5	3.7%
Residual	**45.1 ha**		**246.8 ha**	

Further consultation is required with Local Government, DoPI and OEH to determine possible impacts and offsetting pathways in order to minimise the impact to this community.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The existing patch of vegetation on the GWS is highly degraded and already partially isolated and fragmented from larger tracts of vegetation within the locality. The removal of this patch of Shale Plains Woodland vegetation will increase fragmentation within the site itself and the areas to be retained will be smaller and more spread out than is currently the case.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

This patch of vegetation is highly degraded and greatly modified with the understorey vegetation having been managed through agricultural practices such as grazing, and then more recently also by slashing and grazing for primarily bush fire protection. This patch of woodland vegetation is considered highly disturbed and partially fragmented. Generally it is considered that the woodland to be impacted on the site is not highly important to the long-term survival of this community in the locality.

Fig

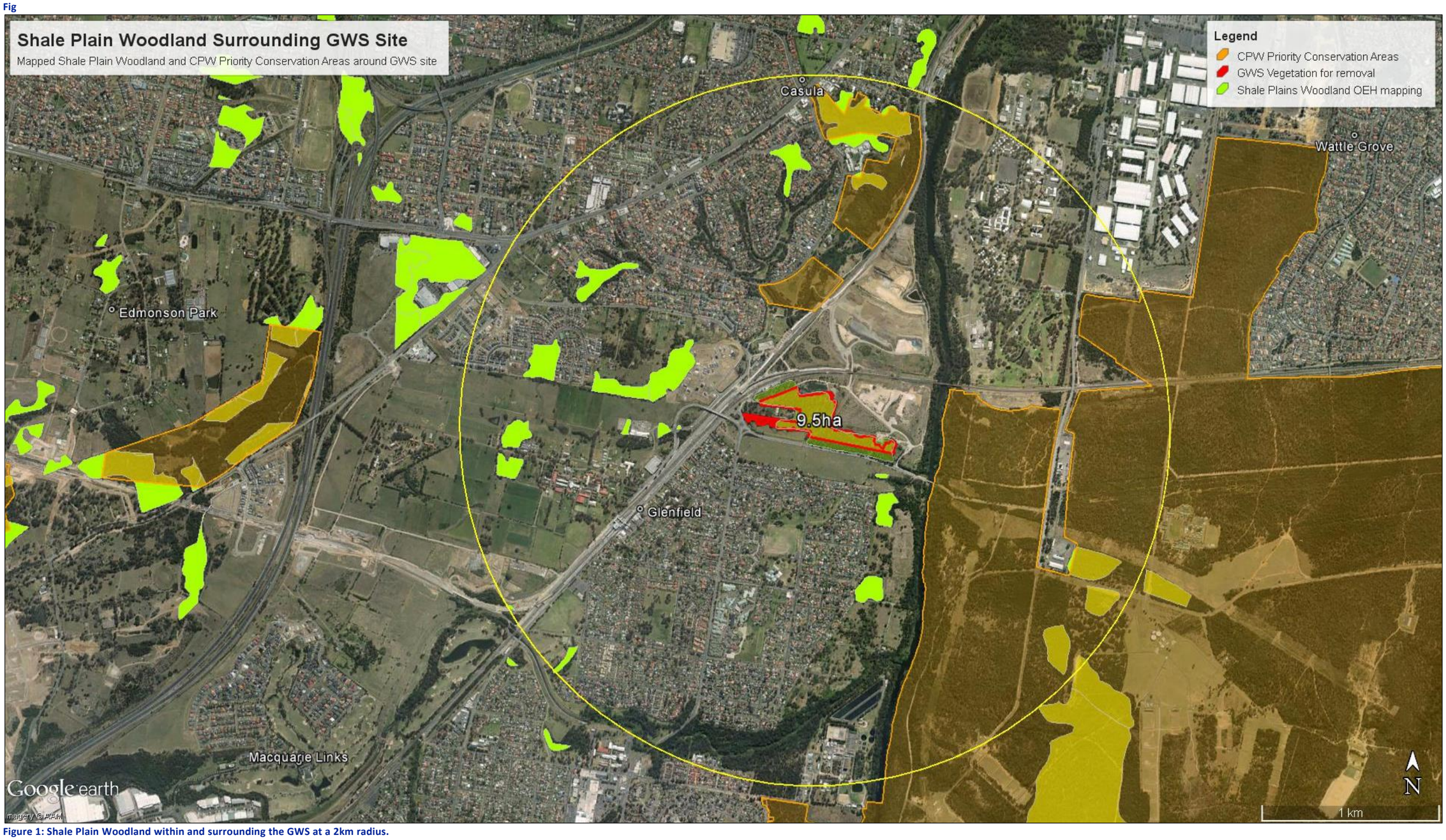

Figure 1: Shale Plain Woodland within and surrounding the GWS at a 2km radius.

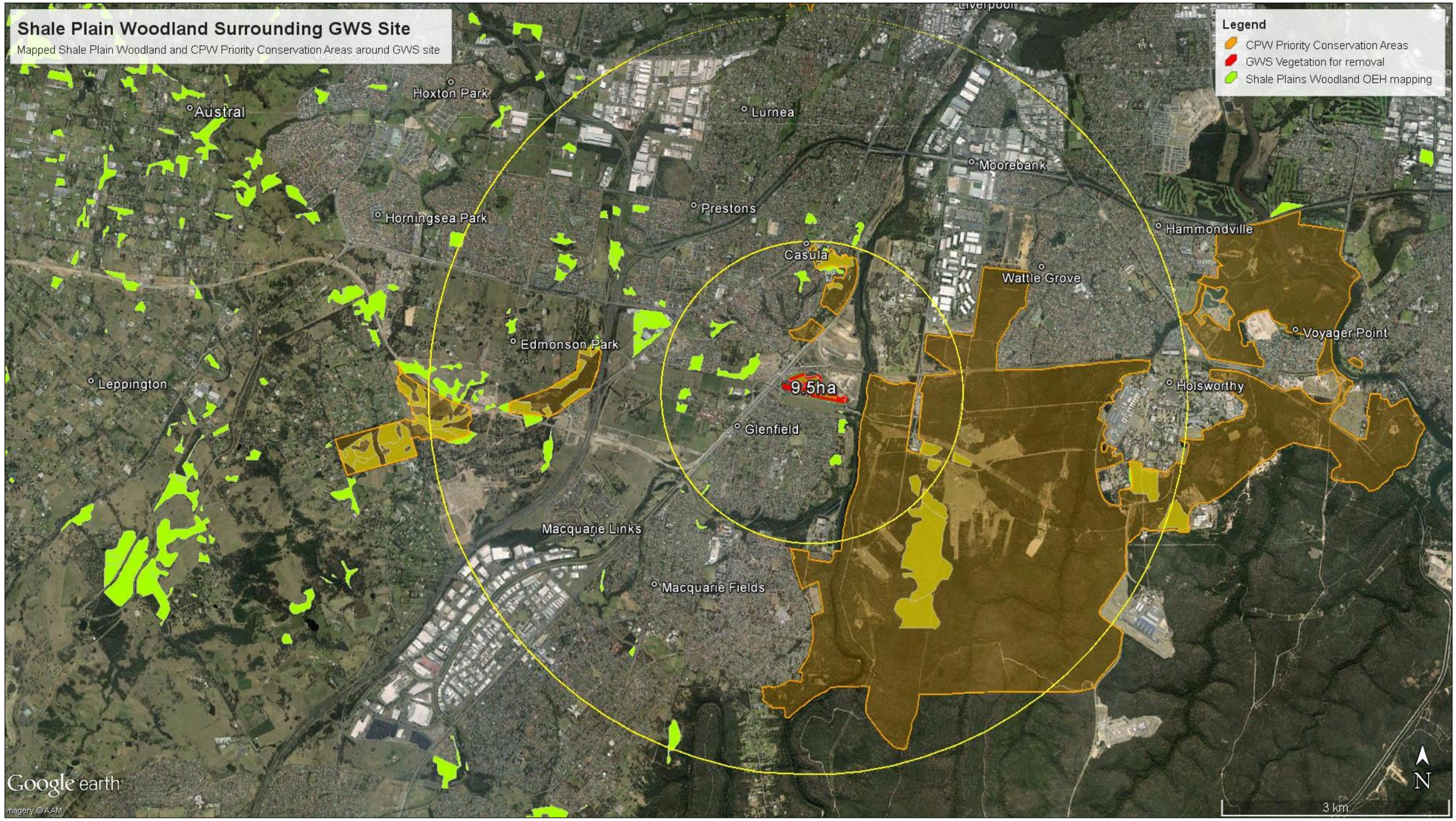

Figure 2: Shale Plain Woodland within and surrounding the GWS at a 5km radius.

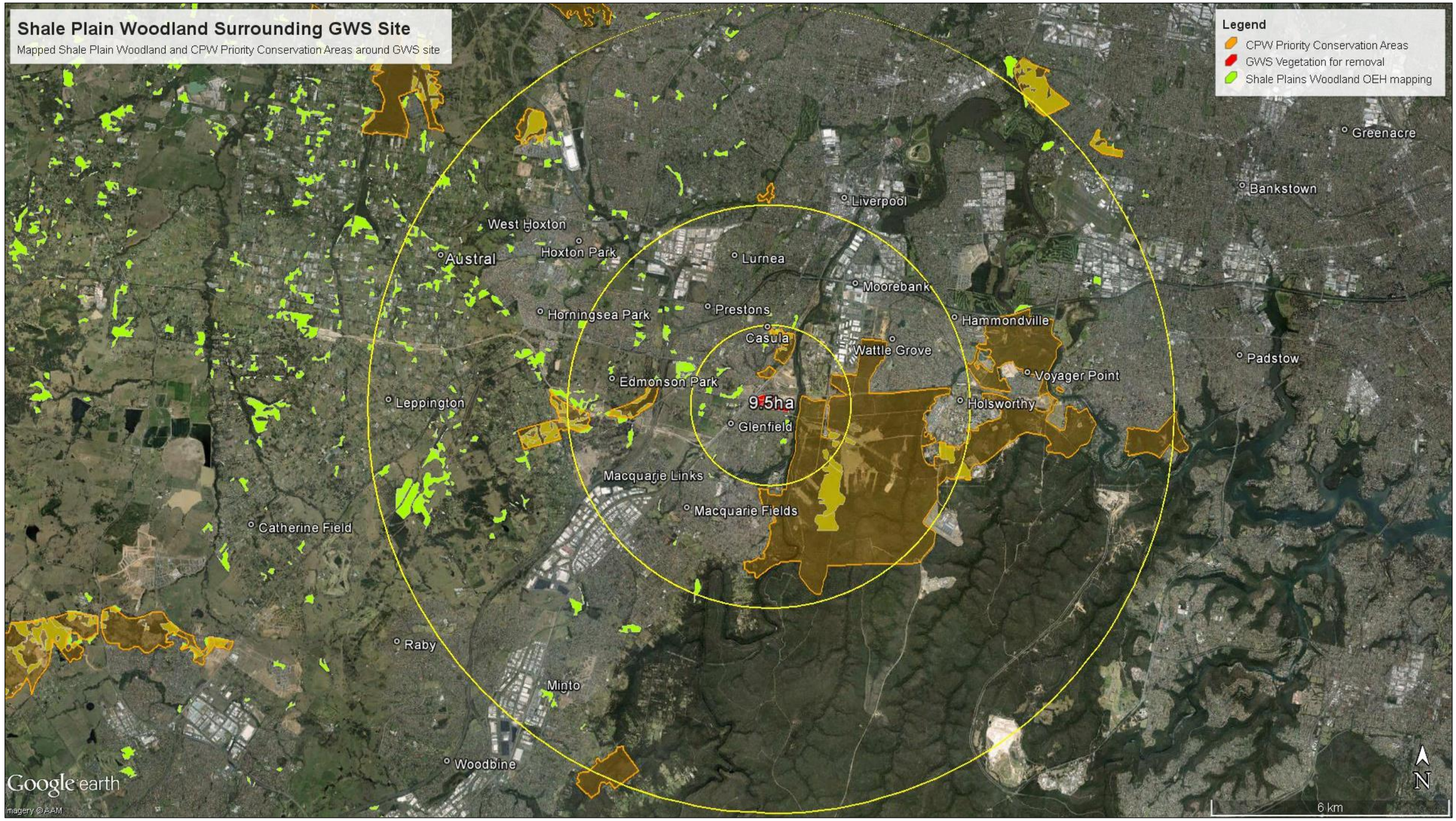

Figure 3: Shale Plain Woodland within and surrounding the GWS at a 10km radius.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

There is a recovery plan in place for the Cumberland Plain Woodland, of which Shale Plain Woodland forms part. It is noted that DECCW (2010) in the *Cumberland Plain Recovery Plan* excluded areas that were "*zoned for residential and industrial purposes*", as well as areas "*that have been identified for future urban growth*". This is largely because of the difficulties in rezoning these areas for conservation purposes - due to their "*higher land values and stronger development pressures*". This is of particular relevance for the GWS site.

The proposal will remove an area of Cumberland Plain Woodland and as such this contradicts recovery strategies for this CEEC. However, this site is highly degraded and partially fragmented.

The recovery plan for the Cumberland Plain Woodland will play a role in determining the offsetting options to mitigate potential impacts to this community and will be used in discussions with Local Government, DoPI and OEH.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential for key threatening processes (KTPs) to impact the CEEC considered likely to occur on site have been considered in Appendix 5 above. The proposal may increase the operation of the KTP "Clearing of vegetation", "Removal of dead wood and dead trees" and "Loss of Hollow-bearing Trees". The proposal involves the intention to clear native vegetation and as such this is considered a KTP, however, the proposed intension is to remove a generally small portion of already highly degraded, fragmented and isolated native vegetation and as such this is consider a minor contribution to this KTP.

Conclusion

It is considered that pursuant to the seven part test criteria that the removal of the 9.5ha of vegetation in the GWS is unlikely to result in a significant impact to:

- result in a likely adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

- be likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

However, the proposed works have the potential to result in an indirect impact over the long term by contributing to the overall degradation of the wider CPW community. The level of indirect impact is difficult to quantify and the temporal scale for this impact is also unknown.

Therefore, it is recommended that some form of biodiversity offset is proposed for the local area to ameliorate the indirect impact over the long term. It is recommended that a combination of locally orientated biodiversity measures be investigated.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Not applicable.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during the site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

> ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
> ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

The River-Flat Forest ecological community occurs alongside the Georges River. It is not proposed that this ecological community will be detrimentally affected by the proposal. In fact, it is proposed that this area of ecological community be protected in perpetuity as part of future biodiversity offset outcomes for the GWS site development.

(d) in relation to the habitat of a threatened species, population or ecological community:

> ***(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and***
> ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and***
> ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality***

The River-Flat Forest ecological community occurs alongside the Georges River. It is not proposed that this ecological community will be detrimentally affected by the proposal. In fact, it is proposed that this area of ecological community be protected in perpetuity as part of future biodiversity offset outcomes for the GWS site development. No significant fragmentation or isolation of this ecological community is considered likely to occur.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

Recovery strategies for threatened communities generally outlined by OEH will play a role in determining the offsetting options to mitigate potential impacts to this community and will be used in discussions with Local Government, DoPI and OEH.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential of key threatening processes (KTPs) to impact the threatened species and ecological communities considered likely to occur within/on the site have been considered in Appendix 5 above. Future management of issues such as weeds as part of future offset outcomes are likely to reduce KTP's impacting this ecological community.

Koala

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

There are recognised Koala feed trees present on site including *Eucalyptus tereticornis*. However, there was no evidence of scats or scratchings on trees. The site is bound by a number of potential barriers to larger (flightless) mammal movement including Cambridge Avenue and Moorebank Avenue, the main south passenger and Southern Sydney Freight railway lines to the west, the East Hills railway line traversing the site and significant residential sprawl surrounding the GWS site. The site is also bounded by a combination of both chain mesh fencing and colourbond fencing that, in combination with the above roads, rail and residential areas, would severely limit Koala movement into the site. The site is also exposed, on a daily basis, to considerable anthropogenic disturbance from the operation of the waste facility including noise and dust from truck movement. The site is considered highly degraded and partially fragmented from larger tracts of vegetation that may be used by this species as part of a larger home range.

The proposed development will remove only a small portion of potential habitat available to the species and is not considered a suitable/safe site for the presence of Koalas. As such the proposal is not considered likely to have an adverse effect on the life cycle of *P. cinereus* such that a viable local population will be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during the site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

> ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
>
> ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Approximately 9.5ha of potential habitat will be affected.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The existing patch of vegetation on the GWS site is highly degraded and already isolated and fragmented from larger tracts of vegetation within the area. The removal of this small patch of Shale Plain Woodland vegetation will not further isolate or fragment any patch of vegetation for this species.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The habitat within the site represents potential foraging/nesting habitat for highly mobile and also less mobile common and threatened species as part of larger home ranges. The site is already highly degraded and partially fragmented. There are risks associated with larger mammal species accessing the site including impacts from cars using the busy Cambridge Avenue and trains using the railway lines running to the west and through the site. The site is also currently bounded on all sides by both chain/wire topped and colour bond fencing. The road and rail, and the addition of anthropogenic disturbance throughout the site are a limiting factor for safe habitat and possible breeding on site. It is not considered likely that the long term survival of this species will be put at risk with the removal of this vegetation.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

There is a Recovery Plan in place for the Koala. The proposal will remove a small area of native vegetation and as such this contradicts recovery. However, this site is highly degraded and fragmented and through numerous field surveys it has been concluded that presence of this species on the site is unlikely.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential of key threatening processes (KTPs) to impact the threatened species and ecological communities considered likely to occur within/on the site have been considered in Appendix 5 above. The proposal may increase the operation of the KTP “Clearing of vegetation”, relevant to this species.

Notwithstanding that the proposal is intended on clearing native vegetation and as such this is considered a KTP, however, the proposal involves the intention to clear native vegetation, and as such this is considered a KTP, the proposal is limited to the removal of a small portion of already highly degraded, fragmented and isolated native vegetation. As such this proposal is considered a very small contribution to this KTP.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

L. aurea may occur within the subject site on occasion as part of a larger home range. However the site is subject to considerable anthropogenic disturbance from the operation of the waste facility and considered highly degraded and partially fragmented from larger tracts of vegetation that may be used by this species as part of a larger home range. There is the potential for species movement on and off the site through possible vehicular transportation, however this is unlikely. In relation to other threatened species and movement on and off the site, this species is not limited by the barrier of the Georges River and as such movement of genetic material is possible. The area around the artificial dam, deemed potential suitable habitat is small in size and is unlikely to provide enough habitat for the presence/ or sustained reproduction of this species. This species was not identified during the targeted diurnal or nocturnal surveys, which were undertaken in accordance with survey guidelines and it is considered unlikely that it actually occurs on the site. The proposal is not considered likely to have an adverse effect on the life cycle of *L. aurea* such that a viable local population will be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during the site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

> ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
>
> ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

> ***(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and***

The small dam will be affected by the GWS projects.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The existing patch of vegetation on the GWS site is highly degraded and already isolated and fragmented from larger tracts of vegetation within the area. The removal of this small patch of Shale Plain Woodland vegetation and the adjoining dam will not further isolate or fragment any patch of vegetation.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The site is already highly degraded and partially fragmented, and the aquatic habitat is considered to be low quality for this species. Only 5% of the fringing vegetation is considered suitable for this species. It is not considered likely that the long term survival of this species will be put at risk with the removal of the habitat on the site.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

There is a draft Recovery Plan in place for the Green and Golden Bell Frog. The proposal will remove a small area of habitat and as such this contradicts recovery strategies for this threatened species. However, this site is highly degraded and fragmented and through numerous field surveys it has been concluded that presence of the species on the site is unlikely.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential of key threatening processes (KTPs) to impact the threatened species and ecological communities considered likely to occur within/on the site have been considered in Appendix 5 above. In relation to this species no significant exacerbation of KTP's is considered likely.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

M. corneovirens may occur within the subject site on occasion as part of a larger home range. However the site is subject to considerable anthropogenic disturbance and considered highly degraded and partially fragmented from larger tracts of vegetation that may be used by this species as part of a larger home range. There is the potential for species movement on and off the site through possible vehicular transportation, however this is highly unlikely. This species was not identified during the targeted diurnal or nocturnal surveys. No evidence of egg clutches or empty shells were observed in areas considered potential habitat including under logs, loose bark or old tyres and sheet iron. The proposal is not considered likely to have an adverse effect on the life cycle of *M. corneovirens* such that a viable local population will be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during the site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

> ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
>
> ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

> ***(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and***

Approximately 9.5ha of potential habitat will be affected.

> ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and***

The existing patch of vegetation on the GWS site is highly degraded and already isolated and fragmented from larger tracts of vegetation within the area. The remaining patches will be further isolated and fragmened from other areas of Cumberland Plain Woodland, although the current patch is quite isolated already.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The site is already highly degraded and partially fragmented. Despite targeted searches, no evidence of the occurrence of this species was recorded and this is likely due to the historic understorey disturbance that has occurred on an ongoing basis. It is not considered likely that the long term survival of this species will be put at risk with the removal of this vegetation.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

The proposal will remove a small area of native vegetation and as such this contradicts recovery strategies for threatened species. However, this site is highly degraded and fragmented and through numerous field surveys it has been concluded that presence of this species on the site is unlikely.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential of key threatening processes (KTPs) to impact the threatened species and ecological communities considered likely to occur within/on the site have been considered in Appendix 5 above. The proposal may increase the operation of the relevant KTP "Clearing of vegetation" and "Removal of dead wood and dead trees".

Notwithstanding that the proposal is intended on clearing native vegetation and as such this is considered a KTP, however, the proposal involves the intention to clear native vegetation, and as such this is considered a KTP, the proposal is limited to the removal of a small portion of already highly degraded, fragmented and isolated native vegetation. As such this proposal is considered a small contribution to this KTP.

Grey-headed Flying Fox

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Single Grey-headed Flying Foxes were recorded in the woodland adjoining the dam in February 2015 on two nights. The woodland habitat is expected to comprise a small proportion of available foraging habitat in the expansive foraging habitats in the locality and region. In addition, the River-Flat Forest will be retained, which provides foraging habitat for this species. It is considered unlikely that the projects would result in a viable local population being placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during the site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

> ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
>
> ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

> ***(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and***

Approximately 9.5ha of potential habitat will be affected.

> ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and***

The existing patch of vegetation on the GWS site is highly degraded and already isolated and fragmented from larger tracts of vegetation within the area. The removal of this patch will increase fragmentation within the site itself and the areas to be retained will be smaller and more spread out than is currently the case.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The habitat within the site represents potential foraging/nesting habitat for this highly mobile threatened species as part of larger home ranges. Expansive foraging habitat existing in the locality. The site is already highly degraded and partially fragmented. It is not considered likely that the long term survival of this species will be put at risk with the removal of this vegetation.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

The proposal will remove a small area of native vegetation and as such this contradicts recovery strategies for this species.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential of key threatening processes (KTPs) to impact the threatened species and ecological communities considered likely to occur within/on the site have been considered in Appendix 5 above. The proposal may increase the operation of the relevant KTP “Clearing of vegetation” to a minor degree.

Hollow/shelter dependent microbats

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Yellow-bellied Sheathtail-bat, East-coast Freetail-bat, Greater Broad-nosed Bat, Eastern False Pipistrelle, Little Bentwing bat, Eastern Bentwing bat and Large-footed myotis were considered likely to forage throughout the site on some occasion. Of these, Yellow-bellied Sheathtail-bat, East-coast Freetail-bat, Little Bentwing bat and Eastern Bentwing bat were recorded foraging within the site.

Hollow-bearing trees with small to medium sized hollows and cracks are present within the subject site. The hollows may be used at some point by these species (particularly The Yellow-bellied Sheathtail-bat and East-coast Freetail-bat) for shelter and breeding.

The clearing of the site is not considered likely to have an adverse effect on the life cycles of these hollow-dependent species such that a viable local population will be placed at risk of extinction. The nearby extensive areas of forest vegetation are likely to contain similar suitable roosting habitat. However it is recommended that an ecologist or Fauna Spotter-catcher be present to supervise vegetation removal within the subject site as a precautionary approach to reduce the risk of harm to fauna. This should include pre-clearance inspections of the tree hollows using a cherry picker. A 2:1 replacement ratio is also to be applied to install nest boxes suitable for these species.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during the site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

> ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
>
> ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Approximately 9.5ha of known foraging habitat will be affected. This includes approximately 109 hollows that may be suitable for roosting by these species.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The existing patch of vegetation on the GWS site is highly degraded and already isolated and fragmented from larger tracts of vegetation within the area. The removal of this patch of Shale Plains Woodland vegetation will increase fragmentation within the site itself and the areas to be retained will be smaller and more spread out than is currently the case.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The habitat within the site represents potential foraging/nesting habitat for highly mobile microbats as part of larger home ranges.

The site is already highly degraded and partially fragmented, however there is a high density of tree hollow suitable for these species to roost in. While roosting habitat is not likely to be a limiting factor in the locality, due to the extensive areas of forest habitat in the Holsworthy area, these hollows are still of value for these species locally. Hence nest boxes / replacement hollows at a ratio of 2:1 is proposed to ensure roosting habitat remains available in the immediate locality.

It is not considered likely that the long term survival of these species will be put at risk with the removal of this vegetation.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

The proposal will remove a small area of native vegetation and as such this contradicts recovery strategies for threatened species. However, this site is highly degraded and fragmented and through numerous field surveys it has been concluded that a significant impact upon these species is unlikely.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential of key threatening processes (KTPs) to impact the threatened species and ecological communities considered likely to occur within/on the site have been considered in Appendix 5 above. The proposal may increase the operation of the KTP "Clearing of vegetation", "Removal of dead wood and dead trees" and "Loss of Hollow-bearing Trees".

Notwithstanding that the proposal is intended on clearing native vegetation and as such this is considered a KTP, however, the proposal involves the intention to clear native vegetation, and as such this is considered a KTP, the proposal is limited to the removal of a small portion of already highly degraded, fragmented and isolated native vegetation. As such this proposal is considered a small contribution to this KTP.

The woodland trees on the site have been surveyed on a number of occasions with a hollow bearing tree assessment having occurred in 2012 and further investigations and observations made in surveys in 2013 and 2014. From this it has been documented that the majority of hollow bearing trees (containing dead limbs) were not being used to a significant extent with only two hollows possibly providing nesting and habitat to Galahs and one hollow providing habitat to European bees. The impact of the proposed development and the removal of hollow bearing trees and dead limbs are considered to be a very small contribution to these two KTP's.

Pimelea spicata

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The site is considered to sustain quite small areas of moderate and low quality Shale Plain Woodland which forms part of this flora species likely habitat. However the site is generally of a poor quality in terms of floristic composition.

This species was the subject of a specific targeted random meander search at a time of year in which this species was known to be flowering at reference sites in close proximity to the GWS site. This species was not identified during this targeted survey.

As the site is highly degraded and fragmented with a high level of anthropogenic disturbance it is considered unlikely that this species is present at this site. The clearing of the site is not considered likely to have an adverse effect on the life cycles of *P. spicata* such that a viable local population will be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

No endangered populations were identified during the site surveys, nor are they considered likely to occur within the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Approximately 9.5ha of low quality potential habitat will be affected.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The existing patch of vegetation on the GWS site is highly degraded and already isolated and fragmented from larger tracts of vegetation within the area. The remaining patch of EEC will be further isolated and fragmented from other areas of Cumberland Plain Woodland, although the current patch is quite isolated already.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The site is already highly degraded and partially fragmented. The habitat is considered to be poor for this species due to the regular underscrubbing that is permitted to occur within the woodland. It is not considered likely that the long term survival this threatened species will be put at risk with the removal of this vegetation.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

The subject site is not located near any declared areas of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

The proposal will remove a small area of native vegetation and as such this contradicts recovery strategies for this species. However, this site is highly degraded and fragmented and through numerous field surveys it has been concluded that presence of this species on the site is unlikely.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The potential of key threatening processes (KTPs) to impact the threatened species and ecological communities considered likely to occur within/on the site have been considered in Appendix 5 above. The proposal may increase the operation of the relevant KTP "Clearing of vegetation".

Notwithstanding that the proposal is intended on clearing native vegetation and as such this is considered a KTP, however, the proposal involves the intention to clear native vegetation, and as such this is considered a KTP, the proposal is limited to the removal of a small portion of already highly degraded, fragmented and isolated native vegetation. As such this proposal is considered a small contribution to this KTP.

Appendix 8

Pimelea spicata Report

EPS

THREATENED SPECIES SURVEY REPORT

Pimelea spicata

ENVIRONMENTAL PROPERTY SERVICES

11009
September 2014

EXECUTIVE SUMMARY

This report outlines the survey assessment requirements for determining the presence of a particular threatened flora species at the Glenfield Waste Services (GWS) site undertaken in December 2013. The objective of the survey was to determine the presence of the flora species *Pimelea spicata* (Spiked-rice flower) listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and as endangered in the schedules of the NSW *Threatened Species Conservation Act 1995*.

This species is endemic to NSW with a relatively scattered distribution occurring in two disjunct areas, the Cumberland Plain (western Sydney) and coastal Illawarra (south of Sydney) (DEC 2005) in the Sydney Basin Bioregion.

The vegetation within the GWS site has been subject to extensive and in some places, ongoing disturbances and is highly modified. Through previous ecological reports the vegetation present within this portion of the site has been surveyed and determined to consist primarily of remnant trees of *Eucalyptus moluccana* and to a lesser extent *Eucalyptus tereticornis* and *Eucalytpus crebra* being of one age class and one stratum. The site has been regularly mown, slashed and managed such that a predominantly cleared understorey occurred across the investigation area.

A targeted survey was undertaken for this species during optimal climatic and seasonal conditions with surveyors following the required methodology as outlined in the NSW Office of Environment and Heritage guidelines. The survey effort has been documented and the results and conclusions are outlined further throughout this report.

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1 INTRODUCTION

1.1 Background

This report has been prepared by Environmental Property Services (EPS) in response to the requirements outlined in a letter received from the Office of Environment and Heritage (OEH) department on the 8th November 2013. OEH had requested that a targeted survey be conducted for the threatened species *Pimelea spicata* in order to determine its presence within the southern parcel of land at the Glenfield site. A species profile can be found in Appendix 1 which gives a description of its morphology and habitat preferences.

1.2 Study Area

The study area consists of the southern parcel of land within the Glenfield site with surveys occurring primarily within what has been determined by the EPS ecologist as being suitable habitat for this species. A map showing the location and area surveyed can be seen in Figure 2-1.

Table 1-1: Summary of the southern parcel of land details

Summary of southern parcel of land details	
Lot and Deposited Plans	Lot 91 DP1155962; Lot 3 DP735524; Lot 3 DP 736881; Lot 1 DP113201; Lot 2 DP 333578
Address	2 Cambridge Avenue, Glenfield NSW 2167
Grid Reference	Zone 56, 306519E 6239570N
Local Government Area	Campbelltown
Catchment Management	Sydney Metropolitan
Primary existing Land Use	Recycling of waste & rail and electricity infrastructure
Current Zoning	Zone 1(a) Rural A Zone, Zone 6(b) Regional Open Space Zone & Zone & 5(b) Special Uses Arterial Roads Zone

1.3 Aims and Objectives

The aim of this assessment was to determine the presence of the threatened flora species *Pimelea spicata* using the methodology outlined in the Threatened Biodiversity Survey and Assessment Guidelines for Developments and Activities (Working Draft) (DEC 2004) and the Department of Environment & Climate Change NSW threatened species assessment guidelines August 2007.

2 METHODOLOGY

2.1 Methodology

2.1.1 Targeted Searches

All methodology has been conducted in accordance with the Threatened Biodiversity Survey and Assessment Guidelines for Developments and Activities (Working Draft) (DEC 2004). In order to determine the presence/absence of this species on the site, the random meander technique and by systematically walking along designated transects was used for the southern parcel of land at the Glenfield site (see Figure 2-1). The Environmental Impact Assessment Guidelines – *Pimelea spicata* (NPWS, 2004) state that *P. spicata* needs to be the subject of a specific targeted survey using the random meander method, favouring suitable habitat areas with a survey effort of at least one hour per hectare of suitable habitat.

The area determined suitable habitat was estimated to be approximately 12 hectares in size. Survey efforts included one hour of targeted surveys per hectare of suitable habitat; therefore surveys occurred for 6 hours per person totalling 12 hours, on the 17th December 2013. Two surveyors traversed the site each holding a handheld GPS in order to show the tracks travelled for replication purposes and for any recordings if the species were to be identified on site.

2.1.2 Reference Site

To comply with the OEH requirements a number of enquiries were made regarding known reference sites for this particular species. Contact was made with two employees from the Australian Botanic Gardens, Mt Annan. Both were able to provide information that the species was flowering in a number of locations in Penrith and in the woodlands at Mt Annan at the time of inspection. It was also discussed that at that time, the climatic and seasonal conditions were optimal for flowering to be occurring. Contact was also made with a Bushland Officer from Camden City Council and he also confirmed that the species was flowering at a site within the Camden Golf Course. A field meeting was set up and EPS staff were shown the location of the site and able to visually examine this species in flower on the 17th December 2013.

2.1.3 Survey Conditions

Table 2-1: Climate data

Date	Temp	Wind	Cloud	Rain
17 December 2013	19°C - 29°C	Still	Clear	None

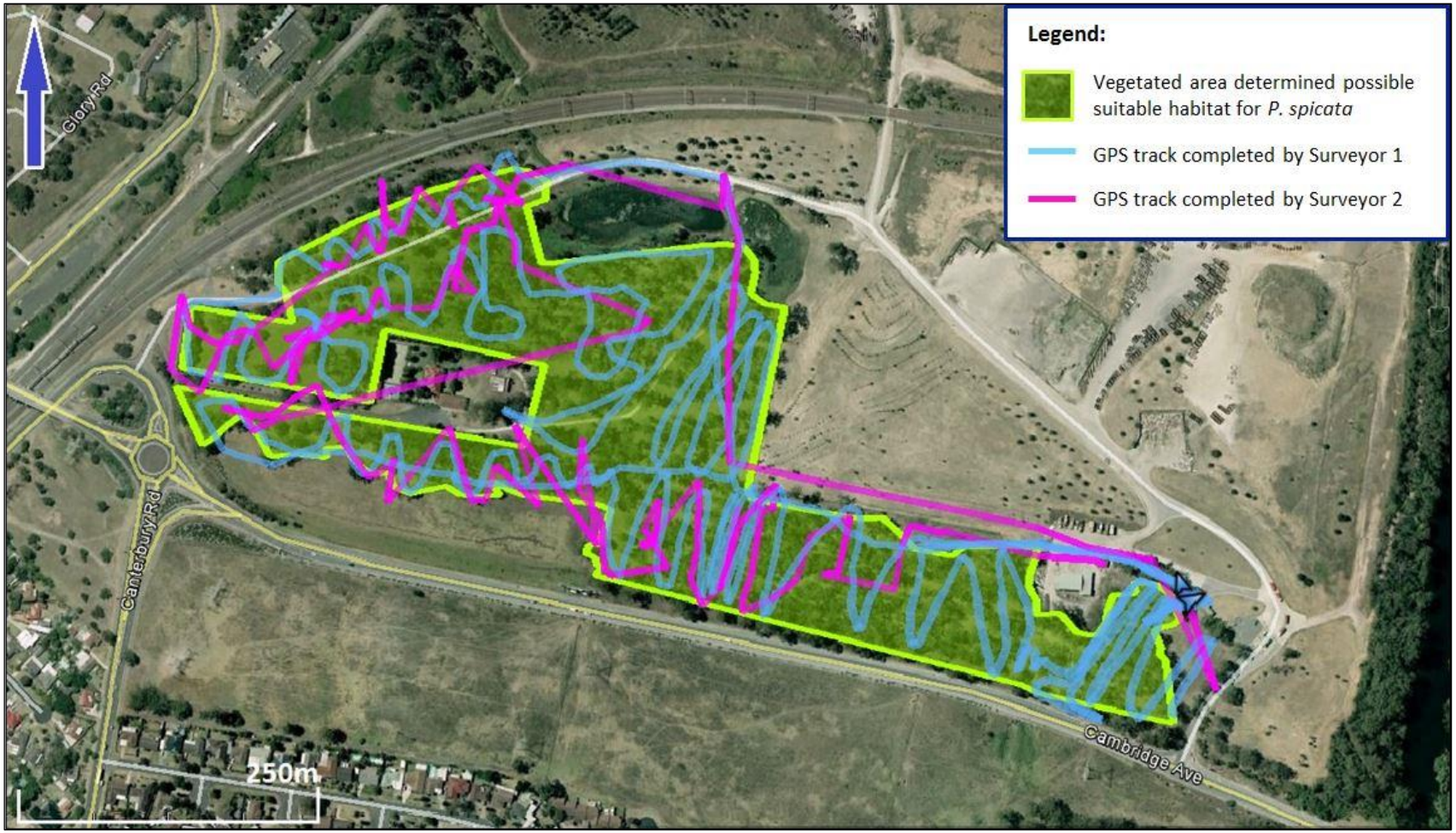


Figure 2-1: Field survey effort for *Pimelea spicata* using the Random Meander Technique.

3 RESULTS & CONCLUSION

The threatened species *Pimelea spicata* was not observed in any of the areas deemed suitable habitat during the field survey. The survey effort has been in accordance with the Methods outlined in the Environmental Impact Assessment Guidelines for *Pimelea spicata* and the 2004 draft OEH guidelines. From this it is concluded that the habitat in the southern parcel of the Glenfield site is not suitable for the presence of this species.

4 REFERENCES

Department of Environment and Conservation (2005) *Pimelea spicata* R.Br. Recovery Plan. Department of Environment and Conservation (NSW), Hurstville NSW.

Department of Environment and Conservation (2004) Environmental Impact Assessment Guidelines – *Pimelea spicata* R.Br. National Parks and Wildlife Service (NPWS), Hurstville NSW.

Department of Environment & Climate Change NSW (2007) Threatened species assessment guidelines – The assessment of significance, Sydney NSW.

Appendix 1

Pimelea spicata - Profile

Pimelea spicata – profile

Scientific name: *Pimelea spicata*
Conservation status in NSW: Endangered
Commonwealth status: Endangered
Profile last updated: 22 Jul 2013

Description

The Spiked Rice-flower is a shrub to 50 cm tall that may be erect or somewhat spreading in habit. The leaves are opposite and elliptical, to 20 mm long by 8 mm wide, and usually held outwards from the stem. The white, pink-tinged flowers are tubular, to 10 mm long, with four spreading petals. They may appear at any time of the year, but are mostly seen in summer as they are probably related to rainfall. Inflorescences start as dense clusters (like most rice flowers) and then extend along an elongating stem as the inflorescences age.

Distribution

Once widespread on the Cumberland Plain, the Spiked Rice-flower occurs in two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama).

Habitat and ecology

- In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils.
- On the Cumberland Plain sites it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark.
- The co-occurring species in the Cumberland Plain sites are grey box (*Eucalyptus moluccana*), forest red gum (*E. tereticornis*) and narrow-leaved ironbark (*E. crebra*). Blackthorn (*Bursaria spinosa*) is often present at sites (and may be important in protection from grazing) and kangaroo grass (*Themeda australis*) is usually present in the groundcover (also indicative of a less intense grazing history).
- In the coastal Illawarra it occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey. Coastal headlands and hilltops are the favoured sites. The IIllawarra populations usually occur in one of two communities a woodland or a coastal grassland. Woodland sites are dominated by forest red gum (*E. tereticornis*) and stringybark (*E. eugenioides*), with a groundcover dominated by kangaroo grass (*Themeda australis*) and matrush (*Lomandra longifolia*). The grassland sites are dominated by kangaroo grass (*Themeda australis*) and matrush (*Lomandra longifolia*), with blady grass (*Imperata cylindrica*). A shrubby layer, where present, is dominated by coastal wattle (*Acacia sophorae*) and coast rosemary (*Westringia fruticosa*) with coast banksia (*Banksia integrifolia*).
- Mature plants spread over short distances through underground rhizomes, and this can assist them to recover from disturbances like fire and irregular grazing. However, the age plants must be, and what proportion recover, is largely unknown.
- Flowers may be self-pollinating, although fruit production is variable. Fruit are not dispersed well, with most seedlings germinating close to the adult (within 30cm or so according to P. Hogbin). A soil seedbank develops and is maintained in the presence of a suitable disturbance regime.

Appendix 9

Flora Recorded During Field Surveys

Family	Scientific Name	Common Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Dams	Soak	RM
Acanthaceae	*Brunoniella australis* PD9,PD10,PD28,PD29	Blue Trumpet	2	1									
Adiantaceae	*Cheilanthes sieberi* subsp. *sieberi* C9,PD10,PD28,PD29	Poison Rock Fern	1										
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed										X	
Apiaceae	*Cyclospermum leptophyllum*	Slender Celery								1			
Apocynaceae	*Araujia sericifera*	Moth Vine	1		1		1	1	1				
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper						2		2			
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	1		2		2	2	2		X		
Asteraceae	*Calotis lappulacea*	-		1						2			
Asteraceae	*Chondrilla juncea*	Skeleton Weed		1	1							X	
Asteraceae	*Cirsium vulgare*	Spear Thistle	2	2	2	2		1	2	2			
Asteraceae	*Conyza* sp.	-		1						1			
Asteraceae	*Coronidium scorpioides*	-	1										
Asteraceae	*Cotula australis*	-		3			2						
Asteraceae	*Cymbonotus lawsonianus* PD10	Bears-ear								1			
Asteraceae	*Hypochaeris glabra*	Smooth Catsear	2	4b			3	2		2			
Asteraceae	*Senecio madagascariensis*	Fireweed	2	3	3	2	2		3	2		X	
Asteraceae	*Soliva sessilis*	Jojo	2			2							
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	2	2	3	1	2	1	3	2			
Asteraceae	*Taraxacum officinale*	Dandelion	2		2	2	3		2	2			
Asteraceae	*Vittadinia cuneata* PD29	Fuzzweed		1									
Asteraceae	*Vittadinia muelleri*	-	1										
Brassicaceae	*Capsella bursa-pastoris*	Shepherds purse					1						
Brassicaceae	*Sisymbrium officinale*	Hedge Mustard											X
Caryophyllaceae	*Cerastium glomeratum*	Mouse-ear Chickweed	2	2			1	1	2				
Caryophyllaceae	*Paronychia brasiliana*	Brazilian Whitlow					4b						
Casuarinaceae	*Casuarina cunninghamiana*	River Oak											X
Casuarinaceae	*Casuarina glauca*	Swamp Oak											X
Crassulaceae	*Bryophyllum delagoense*	Mother-of-millions									X		
Chenopodiaceae	*Einadia hastata* PD10,PD28,PD29	Berry Saltbush	1										
Chenopodiaceae	*Einadia polygonoides* PD9,PD29	-					4b			3			
Chenopodiaceae	*Einadia trigonos* subsp. *stellulata* PD9,PD28,PD29	Fishweed	1				2	2					
Clusiaceae	*Hypericum japonicum*	-							2				
Convolvulaceae	*Dichondra repens* PD9,PD10,PD28,PD29	Kidney Weed	3	3	2	1	2	2	2	3			

Family	Scientific Name	Common Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Dams	Soak	RM
Cyperaceae	*Carex inversa* PD9,PD28,PD29	-						2	2				
Cyperaceae	*Cyperus gracilis* PD9,PD28,PD29	-	2							2			
Cyperaceae	*Cyperus congestus*	-										X	
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed								1			
Fabaceae	*Glycine microphylla* PD9,PD10,PD28,PD29	-	2			1	2	2	1	1			
Fabaceae	*Medicago* sp.	Medic					3						
Fabaceae	*Trifolium repens*	White Clover				2							
Fumariaceae	*Fumaria bastardii*	Bastards Fumitory					2			2			
Geraniaceae	*Geranium solanderi* var. *solanderi* PD9	Native Geranium							4b				
Juncaceae	*Juncus subsecundus*	-									X	X	
Lamiaceae	*Plectranthus parviflorus* PD28	Cockspur Flower						1					
Loranthaceae	*Amyema gaudichaudii* PD29	-											X
Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	1		1		2		2	1			
Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	1	1	1	1	2	2	2	1		X	
Mimosaceae	*Acacia decurrens* PD29	Black Wattle									X		
Myrtaceae	*Angophora subvelutina* U9,U10PD29	-							4b				
Myrtaceae	*Eucalyptus crebra* U9,PD10,PD28,PD29	Narrow-leaved Ironbark				4b							
Myrtaceae	*Eucalyptus moluccana* PD9,PD10,PD28,PD29	Grey Box	5	4b	5	4b	4b	4b		5	X	X	
Myrtaceae	*Eucalyptus tereticornis* PD9,PD10,PD28,PD29	Forest Red Gum				4b		4b	4b		X		
Myrtaceae	*Melaleuca decora* PD29	-	4b								X		
Oleaceae	*Olea europaea* subsp. *cuspidata*	African Olive	2	4b	4b			4b	2	2	X		
Orchidaceae	*Cymbidium suave*	Native Cymbidium							1				
Oxalidaceae	*Oxalis corniculata*	Yellow Wood Sorrel			1								
Oxalidaceae	*Oxalis perennans* PD9,PD10,PD28,PD29	-	2	2			1						
Oxalidaceae	*Oxalis sp.*									1			
Pittosporaceae	*Bursaria spinosa* var. *spinosa* PD9,PD10,PD28,PD29	Blackthorn		2	1		1			1			
Plantaginaceae	*Plantago lanceolata*	Ribwort	3	3	3	2	3	3	6	3			
Plantaginaceae	*Plantago varia*	-	2	1									
Poaceae	*Austrodanthonia fulva* PD29	Wallaby Grass	2										
Poaceae	*Austrostipa elegantissima*	Feather Speargrass	2							4b			
Poaceae	*Bromus catharticus*	Prairie Grass			4b	3	4a	3					
Poaceae	*Chloris gayana*	Rhodes Grass											X
Poaceae	*Chloris ventricosa* PD9,PD10,PD28,PD29	Tall Chloris	3	2	2	2	2			2			

Family	Scientific Name	Common Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Dams	Soak	RM
Poaceae	*Echinopogon ovatus* C9PD28,PD29	Forest Hedgehog Grass						1					
Poaceae	*Ehrharta erecta*	Panic Veldtgrass			4b			3	3	3			
Poaceae	*Entolasia marginata* PD29	Bordered Panic	2							2			
Poaceae	*Eragrostis leptostachya* PD10,PD29	Paddock Lovegrass											X
Poaceae	*Lolium perenne*	Perennial Ryegrass			2								
Poaceae	*Microlaena stipoides* var. *stipoides* C9,PD10,PD28,PD29	Weeping Rice Grass	6	5	4a	3	4b	2	4a	4a			
Poaceae	*Panicum simile* PD29	Two Colour Panic								2			
Poaceae	*Paspalum dilatatum*	Paspalum									X		
Poaceae	*Setaria parviflora*	Slender Pigeon Grass		2	5		2					X	
Poaceae	*Sporobolus africanus*	Parramatta Grass			2								
Polygonaceae	*Rumex brownii*	Swamp Dock			1								
Polygonaceae	*Rumex* sp.	Dock					1	1			X		
Primulaceae	*Anagallis arvensis*	Scarlet Pimpernel					2			1			
Rubiaceae	*Asperula conferta* PD28,PD29	Common Woodruff							4a				
Solanaceae	*Lycium ferocissimum*	African Boxthorn							1	1			
Solanaceae	*Physalis peruviana*	Cape Gooseberry	1					1					
Solanaceae	*Solanum campanulatum*	-	2		1					2			
Solanaceae	*Solanum chenopodioides*	Whitetip Nightshade		1	1			2		2			
Solanaceae	*Solanum nigrum*	Black Nightshade	1		1				1	1	X		
Typhaceae	*Typha* probably *domingensis*	Narrow-leaved Cumbungi									X		

Appendix 10

Fauna Recorded During Field Surveys

Type/Species	Location/Habitat
Amphibians	
Common Eastern Froglet *Crinia signifera*	Siltation Dam, wet soak/drainage area
Striped Marsh Frog *Limnodynastes peronii*	Siltation Dam
Whistling Tree Frog *Litoria verreauxii verreauxii*	Siltation Dam, wet soak/drainage area
Birds	
Australasian Grebe *Tachybaptus novaehollandiae*	Siltation Dam
Australian Magpie *Gymnorhina tibicen*	Throughout investigation area
Australian Raven *Corvus coronoides*	Throughout investigation area
Australian Wood Duck *Chenonetta jubata*	Siltation Dam
Australian White Ibis *Threskiornis molucca*	Siltation Dam
Black Swan *Cygnus atratus*	Siltation Dam
Common Myna *Acridotheres tristis* *	Throughout investigation area
Common Starling *Sturnus vulgaris* *	Flying over site
Eastern Rosella *Platycercus eximius*	Throughout investigation area
Eurasian Coot *Fulica atra*	Siltation Dam
Galah *Cacatua roseicapilla*	Throughout investigation area; in trees with hollows
Great Egret *Ardea alba*	Siltation dam
Grey Butcherbird *Cracticus torquatus*	Throughout investigation area
Indian Myna *Acridotheres tristis* *	Throughout investigation area
Intermediate Egret *Ardea intermedia*	Siltation dam
Laughing Kookaburra *Dacelo novaeguineae*	Throughout investigation area
Little Corella *Cacatua sanguinea*	Flying over investigation area
Little Pied Cormorant *Microcarbo melanoleucos*	Siltation dam
Magpie Lark *Grallina cyanoleuca*	Throughout investigation area
Noisy Miner *Manorina melanocephala*	Throughout investigation area
Pied Cormorant *Phalacrocorax varius*	Siltation Dam
Purple Swamphen *Porphyrio porphyrio*	Siltation Dam
Rainbow Lorikeet *Trichoglossus haematodus*	Woodland near dam
Red Wattlebird *Anthochaera carunculata*	Woodland
Red-whiskered Bulbul *Pycnonotus jocosus* *	Throughout investigation area
Spotted Pardalote *Pardalotus punctatus*	Throughout investigation area
Spotted Turtledove *Streptopelia chinensis* *	Throughout investigation area
Sulphur-crested Cockatoo *Cacatua galerita*	Throughout investigation area
White-faced Heron *Egretta novaehollandiae*	Siltation Dam; flying over site
White-necked Heron *Ardea pacifica*	Siltation Dam
Willie Wagtail *Rhipidura leucophrys*	Next to dam
Yellow-faced Honeyeater *Lichenostomus chrysops*	Throughout investigation area, in trees

Type/Species	Location/Habitat
Mammals	
Common Ringtail Possum *Pseudocheirus peregrinus*	In tree, within investigation area
Chocolate wattled bat *Chalinolobus morio*	Woodland area / dam
Eastern bentwing bat *Miniopterus schreibersii oceanensis*	Woodland area / dam
East-coast freetail bat *Mormopterus (Micronomus) norfolkensis*	Woodland area / dam
Eastern freetail bat *Mormopterus (Ozimops) ridei*	Woodland area / dam
Eastern forest bat *Vespadelus pumilus*	Woodland area / dam
Gould's wattled bat *Chalinolobus gouldii*	Woodland area / dam
Grey-headed Flying Fox *Pteropus poliocephalus*	In tree at edge of woodland next to dam
Little bentwing bat *Miniopterus australis*	Woodland area / dam
Yellow-bellied sheathtail bat *Saccolaimus flaviventris*	Woodland area / dam
White-striped freetail bat *Tadarida australis*	Woodland area / dam

Note: * denotes introduced species

Species in **bold** text are threatened at a Commonwealth or State level.

Appendix 11

Microchiropteran Bat Data (Anabat)

Call #	Date	Frequency of call (kHz)	Species (frequency range)	Certainty of ID definite/probable/possible
1	20/06/12	47 – 47.5	*Vespadelus regulus* (43.5-46) *Miniopterus schreibersii oceanensis* (44 – 47.)5	Possible *Vespadelus regulus* or possible *Miniopterus schreibersii oceanensis*.
2	20/06/12	45 - 45.5	*Vespadelus regulus* (43.5-46) *Miniopterus schreibersii oceanensis* (44 – 47.5)	Probable *Miniopterus schreibersii oceanensis*. See comment 1
3	20/06/12	28 -32.5	*Chalinolobus gouldii* (27.5 – 32.5)	Definite *Chalinobus gouldii.*
4	20/06/12	40.5 – 42.5	*Vespadelus* sp.	Probable *Vespadelus* sp.
5	22/06/12	46.5 – 47.5	*Miniopterus schreibersii oceanensis* (44 – 47.5)	Probable. See comment 2
5	22/06/12	42.5 – 43.5	*Vespadelus* sp.	Probable See comment 2
6	22/06/12	42 - 45	*Miniopterus schreibersii oceanensis* (44 – 47.5) and *Vespadelus darlingtoni* (40 - 43)	Probable *Miniopterus schreibersii oceanensis*
7	22/06/12	47- 48	*Miniopterus schreibersii oceanensis* (44 – 47.5)	Probable
8	22/06/12	40	*Falsistrellus tasmaniensis* (35.5 – 39)	Possible. See comment 3

Comments

1. Time between calls slightly variable.
2. Two bats calling simultaneously.
3. Frequency a touch high but call shape separates from other species in this range.

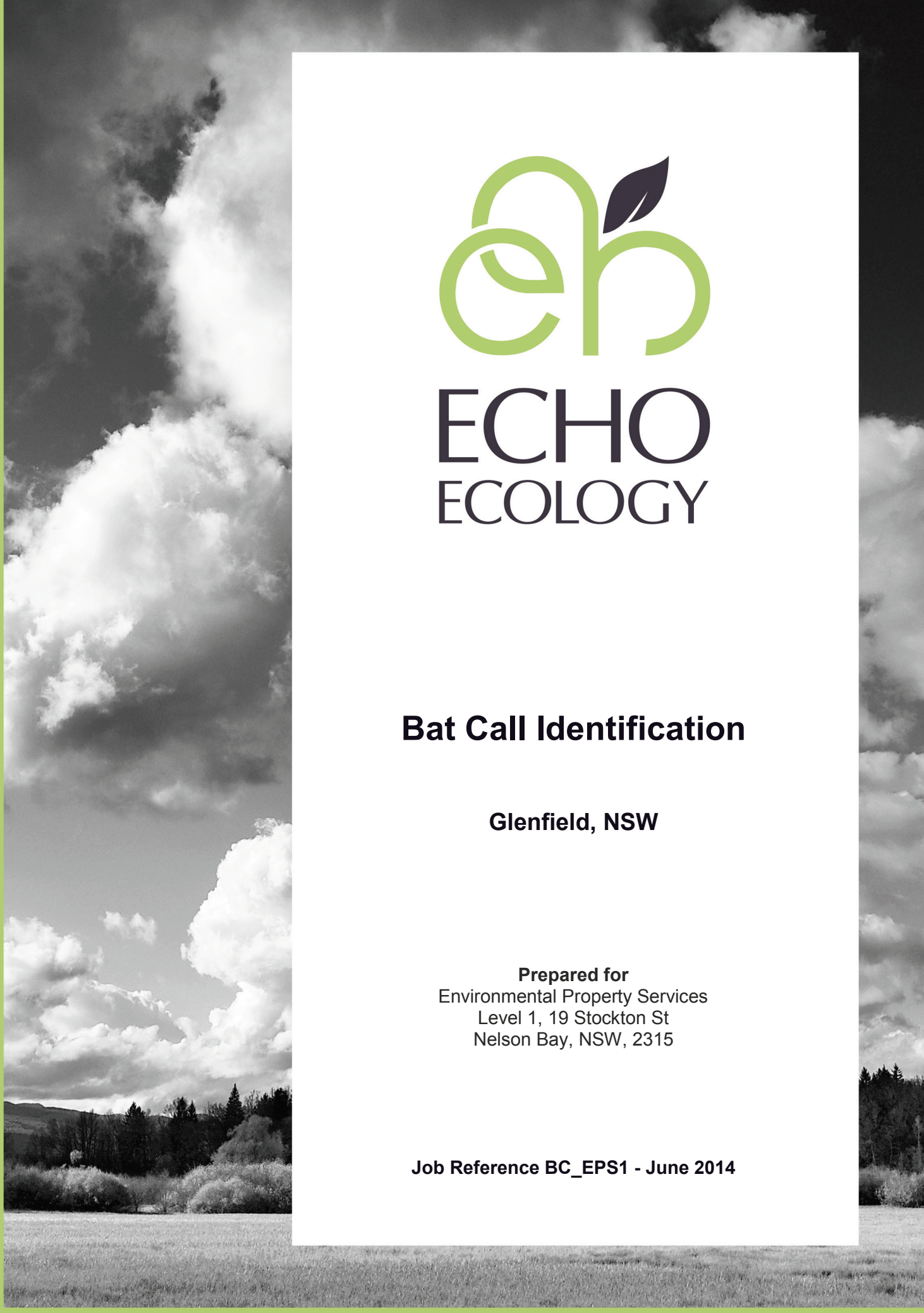
Appendix 12

Hollow Bearing Tree Assessment

Tree ID	Easting	Northing	Species	DBH (cm)	No. Hollows
1	306340	6373660	Dead Tree	40	1 – Trunk Hollow
2	306704	6239378	*E. tereticornis*		3-4 Branch Hollows
3	306681	6239390	*E. tereticornis*		
4	306681	6239396	*E. moluccana*		1 – Trunk Hollow at ground level
5	306650	6239453	*E. moluccana*		1 – Trunk Hollow, vertical spout
6	306587	6239488	*E. moluccana*		5 – Hollows (potential ringtail possum)
7	306565	6239466	*E. moluccana*		1-2 Hollows
8	306532	6239476	*E. moluccana*		3-4 Hollows (horizontal limbs)
9	306530	6239495	*E. moluccana*	85	1 – Hollow, vertical spout
10	306448	6239491	*E. moluccana*	30	1 – Hollow
11	306427	6239494	*E. moluccana*	40	1 – Hollow
12	306414	6239506	*E. moluccana*	40	1 – Trunk Hollow
13	306375	6239512	*E. moluccana*		1 – Open Vertical Spout
14	306356	6239508	*E. moluccana*	30	1 – Trunk Hollow
15	306310	6239511	*E. moluccana*	60	1 – Trunk Hollow (partially dead tree)
16	306259	6239490	*E. moluccana*	100	1 – Horizontal Hollow Branch
17	306260	6239482	*E. moluccana*		Old termite nest, top been removed to form cup shape
18	306233	6239499	*E. moluccana*	35	Hollow trunk (European Bees present)
19	306165	6239524	*E. moluccana*	35	1 – Dead Vertical Branch
20	306094	6239532	*E. moluccana*	50	1 – Trunk Hollow
21	306081	6239540	*E. tereticornis*	100	1 – Trunk Hollow (no scratches present)
22	306542	6239655	*A. floribunda*	50	1 – Branch end hollow
23	306494	6239525	*E. moluccana*	40	1 – Trunk Hollow – 3m above ground
24	306498	6239507	*E. tereticornis*	50	2 – Trunk Hollows
25	306503	6239531	*E. moluccana*	50	2 – branch hollows (spout)
26	306487	6239579	*E. moluccana*	60	6 – Dead Branch Hollows – Galah present
27	306528	6239597	*E. moluccana (dead)*		6 – Trunk Hollows
28	306524	6239611	*E. moluccana*	70	7 – Branch Hollows
29	306520	6239626	*E. moluccana*	70	8 – Branch ends
30	306465	6239620	*E. moluccana*	80	10 – Branch Hollows; 1 – Trunk Hollow (white feathers at base of tree)
31	306501	6239692	*E. tereticornis*	80	1 – Trunk (fork) Hollow
32	306506	6239693	*E. tereticornis*	75	2 – Branch Hollows
33	306452	6239678	*E. moluccana*	90	7 – Branch Hollows
34	306431	6239671	*E. moluccana*	35	2 – Branch Hollows
35	306407	6239672	*E. moluccana*	100	3 – Branch Hollows; 1 – Trunk Hollow (Galah Present, feathers on ground)
36	306386	6239634	*E. moluccana*	85	5 – Trunk Hollows
37	306433	6239541	*E. moluccana*	80	9 – Branch Hollows; 2 – Trunk Hollows
38	306433	6239419	*E. moluccana*	60	3 – Branch Hollows

Appendix 13

Bat Call Identification Report



ECHO ECOLOGY

Bat Call Identification

Glenfield, NSW

Prepared for
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Level 1, 19 Stockton St
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Job Reference BC_EPS1 - June 2014

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This report has been prepared to document the analysis of digital ultrasonic bat echolocation calls received from a third party. The data was not collected by the author and as such no responsibility is taken for the quality of data collection or for the suitability of its subsequent use.

This report was authored by

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Figure 4-5: *Vespadelus pumilus* probable call 8

1.0 INTRODUCTION

This report has been commissioned by Environmental Property Services to analyse bat echolocation call data (Anabat, Titley Electronics) collected from Glenfield, NSW. Data was provided electronically to the author. This report documents the methods involved in analysing bat call data and the results obtained only.

2.0 METHODS

The identification of bat echolocation calls recorded during surveys was undertaken using AnalookW (Version 4.0r) software. The identification of calls was undertaken with reference to Pennay and others (2004) and through the comparison of recorded reference calls from the Sydney Basin. Reference calls were obtained from the NSW database and from the authors personal collection.

Each call sequence ('pass') was assigned to one of five categories, according to the confidence with which an identification could be made, being:

- Definite - Pass identified to species level and could not be confused with another species
- Probable - Pass identified to species level and there is a low chance of confusion with another species
- Possible - Pass identified to species level but short duration or poor quality of the pass increases the chance of confusion with another species
- Species group - Pass could not be identified to species level and could belong to one of two or more species. Occurs more frequently when passes are short or of poor quality
- Unknown - Either background 'noise' files or passes by bats which are too short and/or of poor quality to confidently identify.

Call sequences that were less than three pulses in length were not analysed and were assigned to 'Unknown' and only search phase calls were analysed. Furthermore, some species are difficult to differentiate using bat call analysis due to overlapping call frequencies and similar shape of plotted calls and in these cases calls were assigned to species groups.

The total number of passes (call sequences) per unit per night was tallied to give an index of activity.

It should be noted that the activity levels recorded at different sites may not be readily able to be compared. Such comparisons are dependent on many variables which need to be carefully controlled during data collection and statistically analysed. Influential variables include wind, rain, temperature, duration of recording, season, detector and microphone sensitivity, detector placement, weather protection devices etc.

2.1 Characteristics Used to Differentiate Species

Miniopterus australis was differentiated from *Vespadelus pumilus*, by characteristic frequency or the presence of a down-sweeping tail on pulses. Call sequences which had a majority of pulses containing an up-sweeping tail were assigned to *Vespadelus pumilus*.

Calls from *Mormopterus* sp. were differentiated by the presence of mainly flat pulses. *Mormopterus norfolkensis* was differentiated from *Mormopterus* species 2 in long call sequences where pulses alternated, often with a downward sloping tail.

Chalinolobus gouldii was differentiated from other species by the presence of curved, alternating call pulses.

Scotorepens orion, *Scoteanax rueppellii* and *Falsistrellus tasmaniensis* were unable to be differentiated from one another.

Myotis macropus, Nyctophilus geoffroyi and *Nyctophilus gouldi* were unable to be differentiated from one another.

Tadarida australis were differentiated from other bat species on the basis of characteristic frequency.

3.0 RESULTS

A total of 474 call sequences were recorded, of which 303 call sequences were able to be analysed (ie were not 'noise' files or bat calls of short length). Of the bat calls, 106 call sequences (35 %) were able to be confidently identified (those classified as either definite or probable identifications) to species level (Table 3-1). Species recorded confidently within the site include:

- *Chalinolobus gouldii* (Gould's wattled bat)
- *Mormopterus norfolkensis* (East-coast freetail bat)
- *Mormopterus* species 2 (Eastern freetail bat)
- *Tadarida australis* (White-striped freetail bat)
- *Vespadelus pumilus* (Eastern forest bat)

Additionally, the following bat species potentially occurred within the site, but could not be confidently identified (those calls classified as possible or as a species group):

- *Falsistrellus tasmaniensis* (Eastern falsistrelle)
- *Miniopterus australis* (Little bentwing bat)
- *Miniopterus schreibersii oceanensis* (Eastern bentwing bat)
- *Myotis macropus* (Large-footed myotis)
- *Nyctophilus geoffroyi* (Lesser long-eared bat)
- *Nyctophilus gouldi* (Gould's long-eared bat)
- *Scoteanax rueppellii* (Greater broad-nosed bat)
- *Scotorepens orion* (Eastern broad-nosed bat)
- *Vespadelus darlingtoni* (Large forest bat)
- *Vespadelus regulus* (Southern forest bat)

It should be noted that additional bat species may be present within the site but were not recorded by the detectors and habitat assessment should be used in conjunction with these results to determine the likelihood of occurrence of other bat species.

Table 3-1 below summarises the results of the bat call analysis.

Table 3-1: Results of bat call analysis (number of passes per site per night)

IDENTIFICATION	Anabat 1 25/05/2014	Anabat 1 26/05/2014	Anabat 1 27/05/2014	Anabat 1 28/05/2014
DEFINITE				
Chalinolobus gouldii	-	-	1	-
Mormopterus norfolkensis	1	4	2	-
Mormopterus species 2	8	13	5	-
Tadarida australis	12	9	7	-
PROBABLE				
Chalinolobus gouldii	-	1	-	-
Mormopterus norfolkensis	3	1	2	2
Mormopterus species 2	8	8	14	-
Tadarida australis	-	3	1	-
Vespadelus pumilus	-	-	1	-
POSSIBLE				
Mormopterus norfolkensis	1	1	2	-
Mormopterus species 2	-	-	2	-
Tadarida australis	-	1	-	-
SPECIES GROUPS				
Chalinolobus gouldii / Mormopterus norfolkensis / Mormopterus species 2	16	22	35	2
Chalinolobus gouldii / Mormopterus species 2	7	13	8	-
Falsistrellus tasmaniensis / Scotorepens orion	-	1	-	-
Falsistrellus tasmaniensis / Scotorepens orion / Scoteanax rueppellii	1	3	2	-
Miniopterus australis / Vespadelus pumilus	-	-	2	-
Miniopterus schreibersii oceanensis / Vespadelus darlingtoni / Vespadelus regulus	1	5	2	-

IDENTIFICATION	Anabat 1 25/05/2014	Anabat 1 26/05/2014	Anabat 1 27/05/2014	Anabat 1 28/05/2014
Mormopterus norfolkensis / Mormopterus species 2	7	23	37	1
Myotis macropus / Nyctophilus geoffroyi / Nyctophilus gouldi	1	-	-	-
Vespadelus darlingtoni / Vespadelus regulus	1	-	-	-
UNKNOWN				
'Noise' files	11	13	5	-
Unknown	45	52	43	2
TOTAL	**123**	**173**	**171**	**7**

4.0 SAMPLE CALLS

A sample of the calls actually identified from the site for each species is given below.

Figure 4-1: *Chalinolobus gouldii* definite call

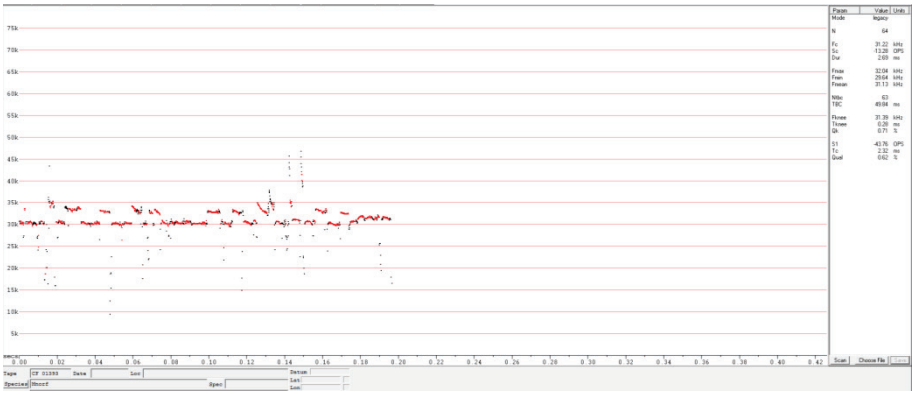

Figure 4-2: *Mormopterus norfolkensis* definite call

Figure 4-3: *Mormopterus* species 2 definite call

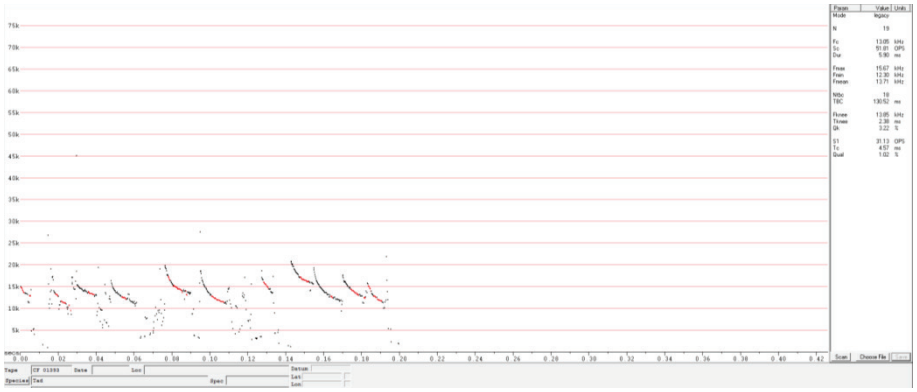

Figure 4-4: *Tadarida australis* definite call

Figure 4-5: *Vespadelus pumilus* probable call

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Appendix 14

Fieldwork Dates Overview

Fieldwork activity	Undertaken by	Date	Time (hr)	year
Preliminary Site investigation	EPS	28th March	Not specified	2012
Diurnal bird Survey	EPS	30th May	0900-1300	2012
Diurnal bird Survey	EPS	21st June	0800-1400	2012
Nocturnal arboreal mammals, birds and microchiropteran Bat Surveys	EPS	20th & 21st June	Night hours x2 separate 1hr searches	2012
Preliminary floristic surveys	EPS	30th May & 12th July	Not specified	2012
Amphibian and Reptile surveys	EPS	30th May	0900-1300	2012
Amphibian and Reptile surveys	EPS	21st June	0800-1400	2012
Targeted Flora Survey *Pimelea spicata*	EPS	17th December	1000-1600	2013
Nocturnal arboreal mammal surveys	EPS	29th April	1800-2000	2014
Nocturnal arboreal mammal surveys	EPS	25th June	1730-2030	2014
Microchiropteran bat recordings	EPS	29th April, 25th, 26th & 27th June	Recorded during night hours	2014
Diurnal Bird surveys	EPS	29th April	1430-1630	2014
Diurnal Bird surveys	EPS	30th April	0800-1000	2014
Nocturnal bird surveys	EPS	29th April	1800-2000	2014
Nocturnal bird surveys	EPS	25th June	1730-2030	2014
Amphibian and Reptile surveys	EPS	29th April	1430-1630	2014
Amphibian and Reptile surveys	EPS	30th April	0800-1000	2014
Amphibian and Reptile surveys	EPS	29th April	1800-2000	2014
Amphibian and Reptile surveys	EPS	25th June	1730-2030	2014
Targeted fauna survey (Green & Golden Bell Frog and Cumberland Plain Land Snail)	EPS	29th April	1430-1700	2014
Targeted fauna survey (Green & Golden Bell Frog and Cumberland Plain Land Snail)	EPS	30th April	0800-1100	2014

Appendix 14

Fieldwork Dates Overview

Fieldwork activity	Undertaken by	Date	Time (hr)	year
Preliminary Site investigation	EPS	28th March	Not specified	2012
Diurnal bird Survey	EPS	30th May	0900-1300	2012
Diurnal bird Survey	EPS	21st June	0800-1400	2012
Nocturnal arboreal mammals, birds and microchiropteran Bat Surveys	EPS	20th & 21st June	Night hours x2 separate 1hr searches	2012
Preliminary floristic surveys	EPS	30th May & 12th July	Not specified	2012
Amphibian and Reptile surveys	EPS	30th May	0900-1300	2012
Amphibian and Reptile surveys	EPS	21st June	0800-1400	2012
Targeted Flora Survey *Pimelea spicata*	EPS	17th December	1000-1600	2013
Nocturnal arboreal mammal surveys	EPS	29th April	1800-2000	2014
Nocturnal arboreal mammal surveys	EPS	25th June	1730-2030	2014
Microchiropteran bat recordings	EPS	29th April, 25th, 26th & 27th June	Recorded during night hours	2014
Diurnal Bird surveys	EPS	29th April	1430-1630	2014
Diurnal Bird surveys	EPS	30th April	0800-1000	2014
Nocturnal bird surveys	EPS	29th April	1800-2000	2014
Nocturnal bird surveys	EPS	25th June	1730-2030	2014
Amphibian and Reptile surveys	EPS	29th April	1430-1630	2014
Amphibian and Reptile surveys	EPS	30th April	0800-1000	2014
Amphibian and Reptile surveys	EPS	29th April	1800-2000	2014
Amphibian and Reptile surveys	EPS	25th June	1730-2030	2014
Targeted fauna survey (Green & Golden Bell Frog and Cumberland Plain Land Snail)	EPS	29th April	1430-1700	2014
Targeted fauna survey (Green & Golden Bell Frog and Cumberland Plain Land Snail)	EPS	30th April	0800-1100	2014
Dip netting for tadpoles & searches targeting Green & Golden Bell Frog	EPS	24th February	1700-2100	2015

Fieldwork activity	Undertaken by	Date	Time (hr)	year
Diurnal Bird surveys	EPS	24th February	1700-1930	2015
Call Playback survey for Green & Golden Bell Frog	EPS	24th February	1930-2105	2015
Micro-chiropteran bat surveys	EPS	24th February	1930-2105	2015
Dip netting for tadpoles & searches targeting Green & Golden Bell Frog	EPS	25th February	1700-2100	2015
Diurnal Bird surveys	EPS	25th February	1700-2000	2015
Call Playback survey for Green & Golden Bell Frog	EPS	25th February	1900-2035	2015
Micro-chiropteran bat surveys	EPS	25th/26th February	Over 1 night from 1900 on the 25th	2015
Dip netting for tadpoles & searches targeting Green & Golden Bell Frog	EPS	26th February	1730-2100	2015
Diurnal Bird surveys	EPS	26th February	1730-1900	2015
Call Playback survey for Green & Golden Bell Frog	EPS	26th February	1900-2020	2015
Micro-chiropteran bat surveys	EPS	26th/27th February	Over 1 night from 1900 on 26th	2015
Micro-chiropteran bat surveys	EPS	27th/28th February	Over 1 night from approximately 1900 on the 27th	2015
Dip netting for tadpoles & searches targeting Green & Golden Bell Frog	EPS	28th February	1730-2100	2015
Diurnal Bird surveys	EPS	28th February	1730-1930	2015
Call Playback survey for Green & Golden Bell Frog	EPS	28th February	1845-2030	2015

Fieldwork activity	Undertaken by	Date	Time (hr)	year
Micro-chiropteran bat surveys	EPS	28th February	1900-2100	2015

Appendix 15

SLR March 2014: Proposed Rezoning and Expansion – Cumberland Plain Woodland Assessment Report

global environmental solutions

Glenfield Waste Services Site
Cambridge Avenue, Glenfield

Proposed Rezoning & Expansion

Cumberland Plain Woodland Assessment Report

28 March 2014

Glenfield Waste Services Site
Cambridge Avenue, Glenfield

Proposed Rezoning & Expansion

Cumberland Plain Woodland Assessment Report

28 March 2014

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GLENFIELD WASTE SERVICES SITE
CAMBRIDGE AVENUE, GLENFIELD

PROPOSED REZONING & EXPANSION

CUMBERLAND PLAIN WOODLAND ASSESSMENT REPORT

28 March 2014

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GLENFIELD WASTE SERVICES SITE
CAMBRIDGE AVENUE, GLENFIELD

PROPOSED REZONING & EXPANSION

CUMBERLAND PLAIN WOODLAND ASSESSMENT REPORT

28 March 2014

1 INTRODUCTION

1.1 The Glenfield Waste Services Site

The Glenfield Waste Services Site is located at Cambridge Avenue, Glenfield (Figure 1), approximately 40 kilometres to the southwest of the Sydney Central Business District (CBD). The northern portion of the site is located in the Liverpool City Council Local Government Area (LGA), whilst the southern portion is located within the Campbelltown LGA.

The 'triangular' portion of land occupied by the Glenfield Waste Services operations is approximately 100ha in area, and comprises a total of thirteen lots (Figure 1):

- the southern part (south of the Glenfield-East Hills Railway Line) -
  - Lot 3 in DP 736881 (on each side of Cambridge Avenue)
  - Lot 1 in DP 113201, Lot 2 in DP 333578, Lot 3 in DP 733524 and most of Lot 91 in DP 1155962
- the northern part (north of the Glenfield-East Hills Railway Line) -
  - part Lot 91 in DP 1155962, Lot 92 in DP 1155962 and Lot 5 in DP 833516 – between the Glenfield-East Hills Railway Line and a Road Reserve
  - Lots 101, 102, 103 and 104 in DP 1143827, Lot 51 in DP 515696 and Lot 52 in DP 517310 – in the northernmost part of the land.

The southern portion of Lot 3 in DP 736881 (south of Cambridge Avenue) is occupied by a transmission line and easement (Figure 2), and is predominantly cleared grassland (except at its eastern part).

The East Hills Railway runs in an east-west direction through the centre of the Glenfield Waste Services Site (Figure 1). The land to the north currently operates as the landfill component of the operations (Figure 1), and is largely cleared - with some riparian vegetation along the Georges River and some grassed areas with a few scatters and patches of planted trees. The land to the south of the East Hills Railway Line (Figure 2) currently contains the recycling facility in its eastern portion, with a relatively large area of vegetated land in the west.

The Glenfield Waste Services Site is roughly triangular in shape (Figure 1), and is bound by:

- the Georges River - along its eastern boundary;
- the Main Southern Railway Line - along its western boundary; and
- residential development and part of the Georges River Nature Reserve (south of Cambridge Avenue) - along its southern boundary.

Much of the surrounding area is developed as residential and industrial land typical of western Sydney (Figure 1), although there are substantial portions of vegetated land to the southeast and along the Georges River to the north. Land to the east (east of the Georges River, is to be developed in part for a major transport intermodal facility.

1.2 The Subject Site

The "*subject site*" for the purposes of this assessment consists of the land to the south of the East Hills Railway Line and north of Cambridge Avenue (Figure 1). In particular, the surveys and assessment contained in this *Report* is focussed on the area of alleged or possible Cumberland Plain Woodland (CPW) in the western and southern vegetated portions of the subject site, north of Cambridge Avenue (Figure 2).

The "*subject site*" is approximately 40 hectares in area, and is bound by the East Hills Railway along its northern boundary, Cambridge Avenue along its southern boundary, and the Georges River at the eastern boundary (Figure 2).

This part of the Glenfield Waste Services site is located wholly within the Campbelltown LGA.

1.3 Future Development

The Glenfield Waste Services operations, particularly the recycling facility within the "*subject site*", needs to be relocated and expanded - within the boundaries of the site. Having consulted with the NSW Environmental Protection Authority (EPA), as the regulator of waste management activities on the subject land, it is the desire of Glenfield Waste Services to expand those operations into the vacant portions of land - to the southwest of the existing operations.

In addition, there is a conceptual plan for the future re-zoning of the subject site for industrial purposes. The assessment of the vegetation present contained in this *Report* does not address future development of the "*subject site*" in any detail at this stage.

1.4 Definitions

Definitions for areas used in this *Cumberland Plain Woodland Assessment Report* include:

- *subject land* the Glenfield Waste Services Site at Cambridge Avenue, Glenfield (Figure 1)

- *subject site* the southern central portion of the subject land - which is being investigated to determine the presence or otherwise of the CPW community (Figure 2)
- *general locality* an area of 10km radius around the *"subject site"*

1.5 Brief from EPS

The brief from EPS for this project included the following points:

- *The aim of the proposed Cumberland Plain Woodland Assessment of the Glenfield Waste Services site southern section of land is to collect detailed information on the presence or otherwise of Cumberland Plain Woodland as part of the statutory requirements for a Development Application for a proposed recycling facility and for the proposed rezoning.*
- *Undertake a detailed field survey of the site in accordance with relevant legislation, policy and guidelines to identify the presence or absence of Cumberland Plain Woodland (CPW) and the condition or varying condition of the CPW.*
- *Map the location of the CPW on the site.*
- *Provide detailed discussion of the CPW including:*
  - *The condition or varying condition of the CPW;*
  - *Determining the precise distribution of vegetation that satisfies the CPW criteria and the vegetation that does not satisfy the criteria;*
  - *Assessing the CPW against the criteria in the Final Determination for the CPW community pursuant to the NSW Threatened Species Conservation Act 1995 (TSC Act) including any legal interpretation of the Final Determination for the CPW community; and*
  - *Assessing the possible CPW against the criteria in the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) including any legal interpretation of the criteria in the EPBC Act.*

1.6 Scope and Aims of this Report

The aims of this *Cumberland Plain Woodland Assessment Report* with respect to the subject site at Cambridge Avenue, Glenfield are to fulfil the brief of EPS as detailed above. In particular, this *Report* aims:

- to undertake background research regarding any existing vegetation mapping of the subject site;
- to undertake a site survey:
  - to verify the vegetation present;
  - to collect a detailed flora species list;
  - to undertake a series of flora survey quadrats;
- to determine likely ecological constraints to future rezoning and development of the site;

- to provide initial recommendations with respect to any restrictions to development activities that might apply and/or identifications of areas of vegetation that will or may need to be retained; and
- to provide an initial consideration of the requirement for, and extent of, any biodiversity offsets that may be required.

Consideration of the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act 1999) is also provided.

This *Cumberland Plain Woodland Assessment Report* has taken into account *inter alia* relevant statutory and planning policies, and agency *Guidelines*, including:

- the *Environmental Planning & Assessment Act 1979* (EP&A Act);
- the *Threatened Species Conservation Act 1995* (TSC Act);
- the *Native Vegetation Act 2003* (NV Act);
- the *Water Management Act 2000* (WM Act);
- the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act);
- the OEH *Principles for the Use of Biodiversity Offsets in NSW* (2011);
- the OEH *Threatened Species Survey & Assessment Guidelines* (dated 2004);
- OEH documents regarding the Cumberland Plain, including *inter alia*:
  - Sydney Catchment Management Authority and OEH vegetation mapping (CMA/OEH 2009 – Figure 4);
  - vegetation mapping of the subject site and surrounds by the OEH (Tozer *et al* 2010 – Figure 5);
  - the *Cumberland Plain Recovery Plan* (DECCW 2011);
  - *Recovering Bushland on the Cumberland Plain: Best Practice Guidelines for the Management and Restoration of Bushland* (DEC 2005); and
  - the NOW *Guidelines for Riparian Corridors on Waterfront Land* (July 2012).

2 INFORMATION BASE

Existing information regarding relevant threatened and other native biota was obtained from:

- previous investigations undertaken by Gunninah Environmental Consultants[1], Environmental InSites[2] and SLR Ecology on lands in the vicinity of the subject site (*eg* on Council land at Groundsel Avenue, Macquarie Fields and the Culgoa Circuit site at Wattle Grove);
- inspection of the NPWS 2002 vegetation mapping of vegetation in western Sydney (Figure 4), CMA/OEH 2009 vegetation mapping of the locality (Figure 5) and the Tozer *et al* 2010 vegetation mapping (Figure 6); and
- the general published literature on the Cumberland Plain Woodland (see *Bibliography*).

A detailed site survey was undertaken on the 30th of September and 1st of October 2013, to provide specific data and observations for this *Cumberland Plain Woodland Assessment Report*.

The site investigations involved:

- the conduct of a 'Random Meander' survey *sensu* Cropper 1993 (Figure 3);
  - to collect a series of photo points (Figure 2) - to document the various conditions of the vegetation across the site (Appendix A); and
  - to obtain a comprehensive flora species list (Appendix C); and
- the undertaking of 20m x 20m flora survey quadrats (Figure 3) – involving the identification of all species present by intensive walked survey, and the recording of Blaun–Blanquet ratings of abundance/cover for all species (Appendix D).

1 The principal author of this *Report* was previously the owner and Director of Gunninah Environmental Consultants.

2 The authors of this *Report* were previously the Environmental Division of Whelans InSites, Sydney.

3 FLORA and VEGETATION

3.1 Existing vegetation

The subject site is characterised by the existing recycling facility and its operations in its eastern half, and a series of paddocks with a dwelling and large artificial wetland in its western portion (Figure 2; Appendix A). Along the western side of the subject site there is a narrow band of riparian vegetation along the Georges River, which is heavily infested by noxious weeds (such as Wandering Jew, Privet, Lantana and African Olive).

There is also a canopy of Grey Box and occasionally other eucalypts (Forest Red Gum, Stringybark, Narrow-leaved Ironbark and Rough-barked Apple) in a band which extends along the southern central boundary and into the northwestern portion of the site. These trees are characteristic canopy species of the Cumberland Plain Woodland (CPW) community - which is a "*critically endangered ecological community*" (CEEC) listed in the NSW *Threatened Species Conservation Act 1995* (TSC Act), and part of a CEEC listed in the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) – as discussed in detail in Chapter 4.

Detailed site surveys by SLR Ecology (Figures 2 and 3) have determined that there are varying degrees of disturbances to the understorey and groundcover through the subject site, resulting in areas of 'Very Low', 'Low' and 'Moderate' condition vegetation being mapped on the site (Figure 6).

In addition, the recent survey has determined that there are no areas of native grassland present. Areas of native grassland (were they to be present) could potentially constitute the CPW community.

The vegetation across the subject site includes:

- Red Gum – Stringybark Riparian Forest – all of which is in 'Very Low' condition because of the understory of dense noxious weeds.
- Artificial Cumbungi Wetland – which is in 'Low' condition because of its artificial nature and because of the dominance of exotic species around its banks (notwithstanding the extent of Cumbungi and Water Primrose within the wetland).
- Grey Box–Red Gum Woodland - which is in:
  - 'Very Low' condition – where it possesses an entirely cleared understorey and groundcover, or areas of exotic groundcover; and/or
  - 'Low' condition – where there is a mixture of native and exotic species throughout the groundcover.
- Red Gum – Ironbark Woodland - which is in:
  - 'Very Low' condition – where it possesses a largely exotic groundcover; and
  - 'Moderate' condition – where there is a diverse native understorey and groundcover (notwithstanding areas of weed invasion and regular mowing).

The remainder of the subject site contains built and developed land and/or areas which have been subjected to clearing, turfing and planting of horticultural specimens.

3.1.1 Artificial Cumbungi Wetland

There are two artificial wetlands along the northern boundary of the subject site, which are bisected north-south by a bunded dirt track (Figure 7). These wetlands collect surface water from the subject site for treatment and/or re-use.

The western wetland comprises a large area of open water and is fringed by Cumbungi vegetation. The smaller eastern wetland contains dense Cumbungi and Water Primrose. There is also a narrow artificial channel entering from beneath the railway line which feeds into the northwestern corner of the large wetland. This area is dominated by dense Cumbungi and Pampas Grass.

The Cumbungi (*Typha* sp.) and Water Primrose which dominate the wetlands are native species, which are listed as 'characteristic' in the *Final Determination* for the *Freshwater Wetlands on Coastal Floodplains* (FWCF) community - which is listed as an "*endangered ecological community*" (EEC) in the TSC Act.

That EEC is not present, however, as detailed in Chapter 4.

3.1.2 Grey Box – Red Gum Woodland

The Grey Box – Red Gum Woodland occupies much of the vegetated band along the southern portion of the subject site and the paddocks in the centre of the subject site at Cambridge Avenue, Glenfield (Figure 6). The canopy in this vegetation is dominated by Grey Box, with some occasional Forest Red Gum. There is also a mid-canopy of *Melaleuca decora* in a small patch along the southern boundary of the site.

There is virtually no shrub layer throughout this area - with the exception of a few scattered specimens of Blackthorn, African Olive and Africa Boxthorn at the base of trees - which escaped the slashing and mowing for grazing and/or asset protection maintenance.

The groundcover generally comprises scattered and/or sparse patches of grasses and herbs including:

- native grasses (Weeping Grass, Stout Bamboo Grass) and herbs (Blue Trumpet, Kidney Weed, Berry Saltbush and other *Einadia* species); and/or
- exotic grasses (Prairie Grass, Perennial Rye Grass, Kikuyu and Common Couch) and weeds (Cobblers Pegs, Fishweed, Paddy's Lucerne, Red-flowered Mallow, Scarlet Pimpernel and Lamb's Tongue).

Five detailed flora survey quadrats were sampled within this vegetation type, to capture the varying condition of the groundcover throughout the site and to attempt to determine whether the groundcover layer was dominated by native species or exotic species.

The following notes provide a summary of the floristic information detailed in Appendix D for these five quadrats.

- Quadrat 1 -
  - 'Low-Moderate' condition - with 11 natives (all CPW species) and 11 exotics.
  - Dominated by Weeping Grass (native) and Perennial Rye Grass (exotic), with a substantial cover of Lamb's Tongue and *Petrorhagia velutina* (both exotics).

- Quadrat 2
    - ‘Low’ condition - with 8 natives (7 CPW species) and 11 exotics.
    - Dominated by Weeping Grass (native), Perennial Ryegrass and Lamb’s Tongue (both exotics).
- Quadrat 3
    - ‘Moderate’ condition - with 17 natives (16 CPW) and 6 exotics.
    - Dominated by Wallaby Grass (*Rytidosperma racemosum*), Winter Apple, Plump Windmill Grass and Blue Trumpet.
- Quadrat 6
    - ‘Low’ condition - with 8 natives (7 CPW) and 11 exotics.
    - Dominated by Couch, Prairie Grass and Perennial Rye Grass (all exotics), and only scattered native species.
- Quadrat 7
    - ‘Very Low’ condition - with 8 natives (7 CPW) and 10 exotics.
    - Dominated by Stout Bamboo Grass, Panic Veldt Grass and Fishweed (all exotics), and only scattered specimens of native groundcover species.

3.1.3 Red Gum – Ironbark Woodland

The Red Gum – Ironbark Woodland is restricted to a small band along the northwestern boundary and at the western end of the subject site at Cambridge Avenue, Glenfield (Figure 7). The canopy is dominated by Forest Red Gum, Narrow-leaved Ironbark and Grey Box, with occasional specimens of Thin-leaved Stringybark and Rough-barked Apple.

In the northern strip of Red Gum-Ironbark Woodland there is a scattered and patchy shrub layer of mainly Black Wattle, Blackthorn and regrowth eucalypts, with a few patches of Native Cherry and scattered specimens of Gorse Bitter Pea, White Dogwood and *Dillwynia sieberi*. A number of exotic and noxious weed (such as African Olive) are also present.

The groundcover in the southern patch of this community (west of the residence – Quadrat 5) is mown and disturbed, but the northern patch (Quadrat 4) maintains a dense grassy groundcover dominated by Kangaroo Grass. A diversity of native species (including the Eastern Flame Pea, False Coral Pea, Tall Bluebell and *Bossiaea prostrate*) were found within this area of vegetation, but were not observed in any other areas on the subject site.

- Quadrat 4
    - ‘Moderate’ condition - with 19 natives (18 CPW) and 16 exotics.
    - Groundcover dominated by introduced African Love Grass and other weeds, with moderate cover of native (mostly CPW) species.

- Quadrat 5
    - ‘Very Low’ condition - with 4 natives (3 CPW) and 6 exotics.
    - Dominated by introduced Couch lawn grass (exotic).

3.1.4 Red Gum – Stringybark Riparian Forest

This strip of vegetation adjoins the Georges River - along the eastern boundary of the subject site (Figure 7). It is dominated by Forest Red Gum and Stringybark, with a dense tall mid-canopy of noxious African Olive and Privet, as well as specimens of Black Wattle and Coast Myall. Other weeds include Lantana and Cape Ivy through the shrub layer, and Wandering Jew in the groundcover.

This vegetation type would constitute a very highly degraded form of River-flat Eucalypt Forest on Coastal Floodplains (REFCF) - which is an "*endangered ecological community*" (EEC) listed in the TSC Act.

No flora survey quadrats were undertaken in the Red Gum-Stringybark Riparian Forest – because there is no prospect of any development activities in this area. The zoning of this strip of land (for *Environmental Protection* purposes) and the constraints imposed by the *Water Management Act 2000* would essentially prevent any activities other than vegetation rehabilitation works at this location.

3.2 Flora Species

Random Meander and systematic botanical surveys conducted as part of this investigation have recorded a total of 132 plant species from within the subject site (Appendix C). Of these, a total of 71 native species were recorded, along with 61 exotic species. A few of the exotic species (including Privet and African Olive) are also listed as noxious in NSW.

Forty nine of the plant species recorded on the subject site (Appendix C) are listed as "*characteristic*" species in the *Final Determination* (Scientific Committee website 2013) for the CPW community.

4 ENDANGERED ECOLOGICAL COMMUNITIES

The vegetation mapping of the subject site by the OEH/CMA 2009 (Figure 5) and by Tozer *et al* 2010 (Figure 6) indicate the presence of two "*threatened ecological communities*" (as listed in the TSC Act) - known as:

- Cumberland Plain Woodland (CPW) – which is listed as a "*critically endangered ecological community*" (CEEC) in the TSC Act, and as part of a CEEC listed in the EPBC Act; and
- River-flat Eucalypt Forest on Coastal Floodplains (REFCF) – which is listed as an EEC in the TSC Act.

Ground-truthing of the vegetation present on the subject site at Glenfield by SLR Ecology (Figure 7) has determined that:

- there is a highly disturbed narrow band of REFCF vegetation along the eastern boundary of the site (adjoining the Georges River); and
- there is a variously disturbed band of CPW vegetation along the southern boundary and in the western parts of the subject site.

4.1 Cumberland Plain Woodland

4.1.1 The CPW Community – TSC Act

The following points from the *Final Determination* are relevant in determining the presence (or otherwise) of CPW on the subject site at Glenfield:

- Paragraph 2 - "*Cumberland Plain Woodland .. typically comprises an open tree canopy, a **near-continuous groundcover dominated by** **[native]** **grasses and herbs**, sometimes with layers of shrubs and/or small trees*" (emphasis added);
- Paragraph 3 - the "*assemblage of species*" by which the "*Cumberland Plain Woodland is **characterised***" (emphasis added) does not contain any introduced or exotic plant species. All of the "*grasses and herbs*" which are characteristic of the CPW community are native species;
- Paragraph 5 - "*The ground cover **is dominated** by a diverse range of* [native] *grasses*" (emphasis added) and "*The ground cover also includes a **diversity** of* [native] *forbs*" (emphasis added);
- Paragraph 6 - "***Either or both** of the upper storey and mid-storey **may be absent** from the community*" (emphases added); and
- Paragraph 6 - "*Native grasslands derived from clearing of the woodland and forest are also part of this community if they contain characteristic non-woody species listed in paragraph 3*".

Based on the above considerations, it is concluded that much of the woodland vegetation on the subject site does constitute the CPW community, despite being only in 'Low' to 'Moderate' condition.

However, some of the vegetation on the "*subject site*" arguably does not constitute the CPW community because, whilst there is a canopy of "*scattered trees*", which are "*characteristic*" of the CPW community:

- the groundcover is **not** "***dominated** by a **diverse** range of* [native] *grasses*";
- the groundcover layer does **not** include "*a **diversity** of* [native] *forbs*"; and
- the *Final Determination*, whilst specifically allowing for the absence of the "*upper storey or mid-storey*", does not countenance, anywhere, the absence of a native groundcover layer. Indeed, the antithesis is the case (*ie* 'derived grassland' = "*groundcover alone can constitute CPW*").

The vegetation on the subject site mapped as 'Very Low' condition (Figures 7 and 8) is not considered by SLR Ecology to conform to the definitions outlined within the *Final Determination* for CPW - based on the scarcity of native groundcover and understorey plants, and the dominance of exotic species in the groundcover layer (as discussed above).

4.1.2 The CPW Community – EPBC Act

In addition to its listing as a CEEC in the TSC Act, the Cumberland Plain Woodland (CPW) community is listed as part of a CEEC in the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act).

However, unlike the TSC Act (in which trees are not necessary for the CPW community to be present), the EPBC Act explicitly states that trees are necessary for a stand of vegetation to be classified as CPW.

Importantly (and most valuably), the EPBC Act listing also provides *Threshold Criteria* for CPW vegetation, which requires *inter alia* that:

- the area of the patch of vegetation be larger than one hectare; and
- at least 30% of the groundcover species be native plants typical of the CPW community.

The patch of vegetation on the subject site at Glenfield certainly constitutes an area greater than 1 hectare in size.

Consideration of the criteria with respect to understorey species and groundcover species, pursuant to the EPBC Act listing and the criteria identified above, reveals a similar outcome to that identified above with respect to the TSC Act.

Those areas of vegetation which are in 'Very Low' condition are not regarded as satisfying the EPBC Act criteria for the CPW community (as part of a CEEC) – because they are dominated by introduced groundcover species, and have only scattered native groundcover species with low diversity. However, those areas of vegetation which are in 'Low' or 'Moderate' condition are considered likely to satisfy the criteria for the CPW community as listed in the EPBC Act.

Depending on the extent of vegetation proposed to be removed, it is possible (likely in fact) that a formal *Referral* of the project to the Commonwealth will be required. The success of any such *Referral* will be dependent on the extent of removal of CPW vegetation, and on the offsets proposed.

4.1.3 The Cumberland Plain Recovery Plan

The *Cumberland Plain Recovery Plan* is a document prepared by the then DECCW (2010) which *inter alia* identifies actions required for the recovery of threatened biota across the geographic region of the Cumberland Plain, including the Cumberland Plain Woodland CEEC and other "*threatened ecological communities*" (TECs), as well as threatened species associated with that vegetation.

As one element of the *Recovery Plan*, an array of areas have been identified as "*priority conservation lands*" (PCLs) - defined by DECCW (2010) as those which "*represent the best remaining opportunities in the region to maximise long-term biodiversity benefits for the lowest possible cost, including the least likelihood of restricting land supply*". These areas occupy a total area within the Sydney Basin of approximately 25,566ha, and are considered by DECCW "*to be the highest priority for future efforts to conserve the threatened biodiversity of the region*".

DECCW (2010) note that "*it is important that prioritisation and investment in the recovery program be guided by sound principles. These principles, based upon the best available ecological evidence, are that*":

- "*the protection and management of large, intact remnants is more effective and efficient than for smaller, fragmented remnants*";
- "*recovery efforts need to aim to ensure that a representative sample of biodiversity is conserved*";
- "*active management to best practice standards is needed to prevent the degradation of bushland in a fragmented landscape*"; and
- *"where impacts on biodiversity cannot be avoided, they should be offset using appropriate means*".

In regard to the retention of large intact patches of vegetation, the *Recovery Plan* notes:

- *"evidence clearly suggests that larger remnants have a better prospect for long-term survival. Larger remnants are usually more diverse and resilient than smaller remnants, and are less susceptible to 'edge effects', catastrophic events, and the expected impacts of climate change*"; and
- *"threatened woodland birds such as the Brown Treecreeper and Hooded Robin have persisted in the larger, better connected remnants. These remnants are not dominated by aggressive bird species and retain the characteristic habitat requirements for woodland bird fauna. Similarly, a number of mammal species have been recorded from the larger connected remnants*"*.*

The Georges River Nature Reserve and Holsworthy Military Reserve are located to the south of subject site (Figure 7), and include large contiguous areas of native vegetation. Some of the larger tracts of vegetation in the vicinity have been identified as *Priority Conservation Lands* (PCLs) in the *Cumberland Plain Recovery Plan* (DECCW 2010) – but vegetation on the subject land and the subject site has not been identified as a PCL (Figure 8).

In contrast to the PCLs, the vegetation on the subject site is small in extent, and is significantly modified and degraded (Appendix A). In addition, it is isolated from the nearby PCLs and other notable areas of vegetation by the existing uses of the eastern part of the site, and by other clearing, disturbance and development (Figures 1, 2 and 8).

It is noted that DECCW (2010) in the *Cumberland Plain Recovery Plan* excluded areas that were "*zoned for residential and industrial purposes*", as well as areas "*that have been identified for future urban growth*". This largely because of the difficulties in rezoning these areas for conservation purposes - due to their "*higher land values and stronger development pressures*".

According to the *Recovery Plan*, a total of 39% of the extant Cumberland Plain Woodland vegetation is located within the PCLs, and is (theoretically at least) protected by the *Recovery Plan*. The subject site was not considered by DECCW to constitute even part of a PCL (Figure 8).

4.2 Cumberland Plain Woodland - Conclusions

On the basis of all of the considerations documented above, some of the open forest and woodland vegetation on the subject site at Glenfield would clearly satisfy the criteria identified in the *Cumberland Plain Recovery Plan* for the Cumberland Plain Woodland (CPW) community – as listed both in the TSC Act and EPBC Act. The areas which do constitute the CPW community, however, are moderately to highly disturbed, and have been so for a considerable period.

Some of the woodland vegetation present, however, is not considered to satisfy the criteria for the listing of the CPW community pursuant to either the TSC Act or EPBC Act. This view is based on:

- the depauperate nature portions of the vegetation present (particularly the dominance of introduced species in the groundcover layer);
- the deliberations within the *Cumberland Plain Recovery Plan*; and
- the mapping of vegetation in this part of Sydney by Tozer *et al* 2010 (Figure 6) – which indicates potential areas of vegetation which do not satisfy the criteria identified in the *Cumberland Plain Recovery Plan*.

There are a number of areas of vegetation which are very highly modified and degraded, which do not, in the opinion of SLR Ecology, satisfy the criteria for the CPW community (Figure 7).

4.3 Freshwater Wetlands on Coastal Floodplains

The *Final Determination* for the listing of the Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (FWCF) community as "*endangered ecological community*" (EEC) in the TSC Act, states *inter alia* (in paragraph 4) that:

- "*Artificial wetlands created on previously dry lands specifically for purposes such as sewage treatment, stormwater management and farm production, are not regarded as part of this community*".

The watercourses and freshwater ponds contained within the Glenfield Waste Services site are all artificial in nature, and have been constructed specifically for the purposes of "*stormwater management*". Notwithstanding the floristics of some of these features, which conform in part at least to the floristic assemblage for the FWCF community, that EEC is not present (because of the artificial nature of the relevant features).

5 CONCLUSIONS

A detailed investigation of vegetation within the "*subject site*" (*ie* part of the Glenfield Waste Services site at Glenfield) has been undertaken in order to determine the extent, nature and condition of native vegetation on the subject site. As discussed above in the *Report*, the subject site constitutes the land between Cambridge Avenue (to the south), the Georges River (to the east) and the Glenfield-East Hills railway line (to the north and northwest).

Significant portions of the subject site have long been cleared and modified, and have long been used in part for an existing waste recycling facility, as well as associated structures (offices, parking areas and a weigh bridge). However, there is a band of native vegetation in the southern, central and western parts of the subject site - which contain a tree canopy of eucalypts which are characteristic of the Cumberland Plain Woodland (CPW) community. There is also a narrow band of highly disturbed open forest along the western edge of the subject site, adjacent to the Georges River.

The CPW community is listed in the *Threatened Species Conservation Act 1995* (TSC Act) as a "*critically endangered ecological community*" (CEEC), and is also listed as part of a CEEC in the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act).

The detailed considerations of vegetation within the subject site by SLR Ecology have determined that some of the woodland vegetation in these areas would constitute an example of the CPW community – as listed both at state and federal level. The woodland vegetation in 'Low' to 'Moderate' condition would satisfy the criteria required to constitute an example of the CPW CEEC.

Conversely, there are areas of vegetation which retain a CPW canopy but which are highly degraded and depauperate. These are identified as being in 'Very Low' condition, and are not considered by SLR Ecology to satisfy the criteria for the CPW community, at either the state or federal level.

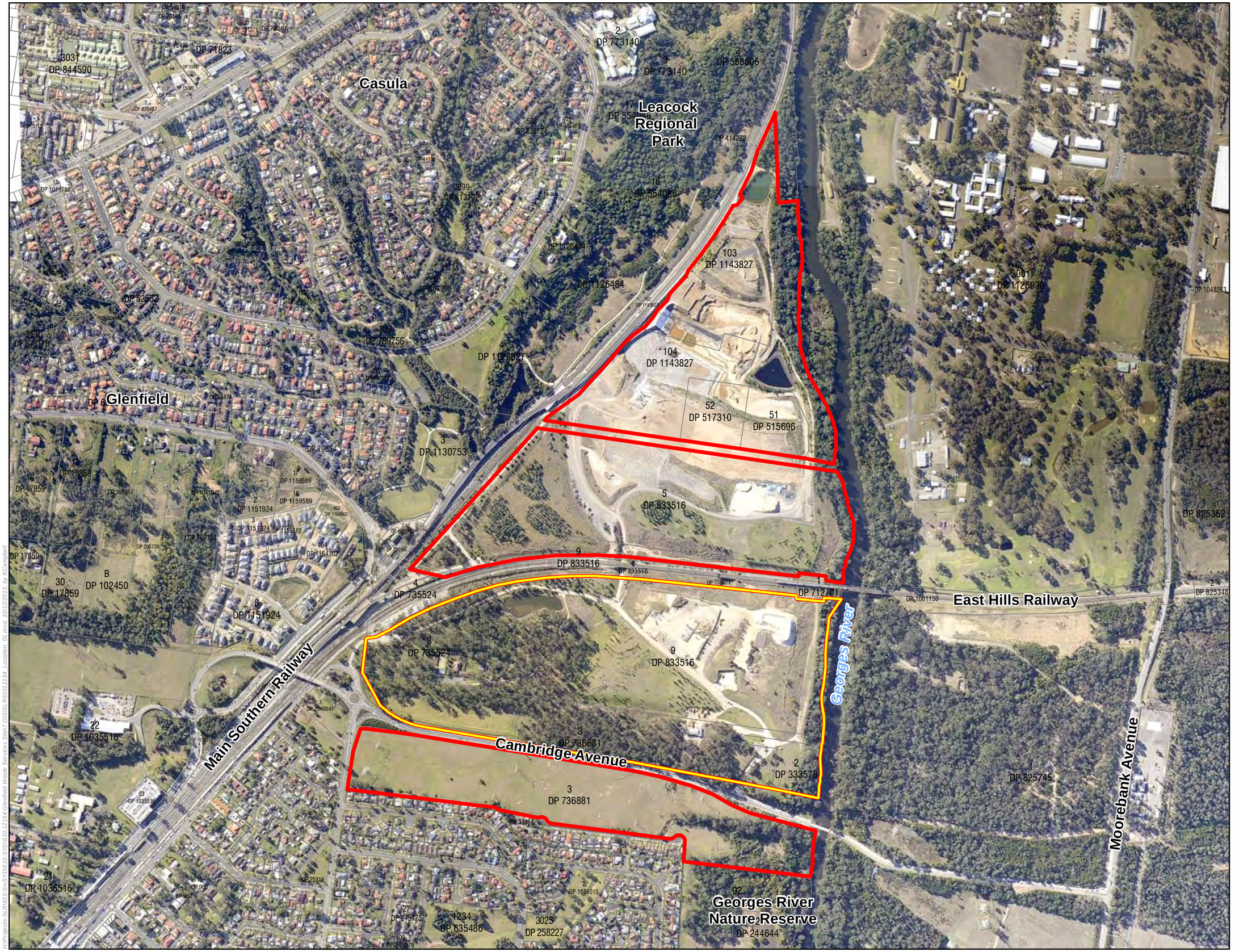
There are artificial ponds and drainage lines on parts of the subject site at Glenfield. These have been constructed for the purposes of "*stormwater management*", and have been colonised by an array of native aquatic and semi-aquatic plant species. Notwithstanding their floristics, these features do not constitute an example of the Freshwater Wetlands on Coastal Floodplains (FWCF) EEC (listed in the TSC Act) - because of the artificial nature of these features.

It is noted, however, that the mere presence of the CPW community does not prohibit development on the subject site, but requires further detailed consideration with respect to:

- the extent of vegetation which can reasonably be removed;
- the need for and quantity of "*biodiversity offsets*" required - to compensate for the removal of CPW vegetation; and
- the relevant considerations to be given to the retention, rehabilitation and long-term management of some of the areas of CPW on the site.

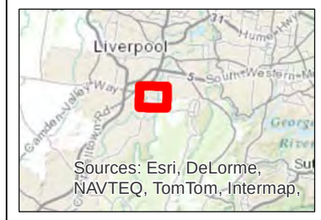
These matters will need further consideration in consultation with Council and the Office of Environment & Heritage (OEH).

Figure 1 Location of the Glenfield Waste Services Site at Glenfield



LEGEND

- Glenfield Waste Services Site
- Subject Site
- Cadastre



N

0 50 100 200 300

Metres

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
3. Map locator courtesy of ESRI 'World Topo Map'
4. All features are approximate only and subject to detailed survey

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Project No: **610.12154**

Scale	Date
1:750,000 @ A3	10/12/2013
Drafted: Kelly Campbell	Approved: Fiona Iolini

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Figure 2 Details of the subject site at Glenfield

LEGEND

- Subject Site
- Water Feature Corridor
- Road Corridor
- Transmission Easement
- Cadastre
- Photo Points

0 50 100 Metres

N

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
3. Photo Point surveyed by SLR Ecology on the 30th of September and 1st of October 2013
4. All features are approximate only and subject to detailed survey

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Figure 3

Recent flora surveys on the subject site at Glenfield

LEGEND

- Subject Site
- Flora Meander
- Flora Quadrats
- Cadastre

0 50 100
Metres

N

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
3. Flora Meander and Quadrats surveyed by SLR Ecology on the 30th of Septenber and 1st of October 2013
4. All features are approximate only and subject to detailed survey

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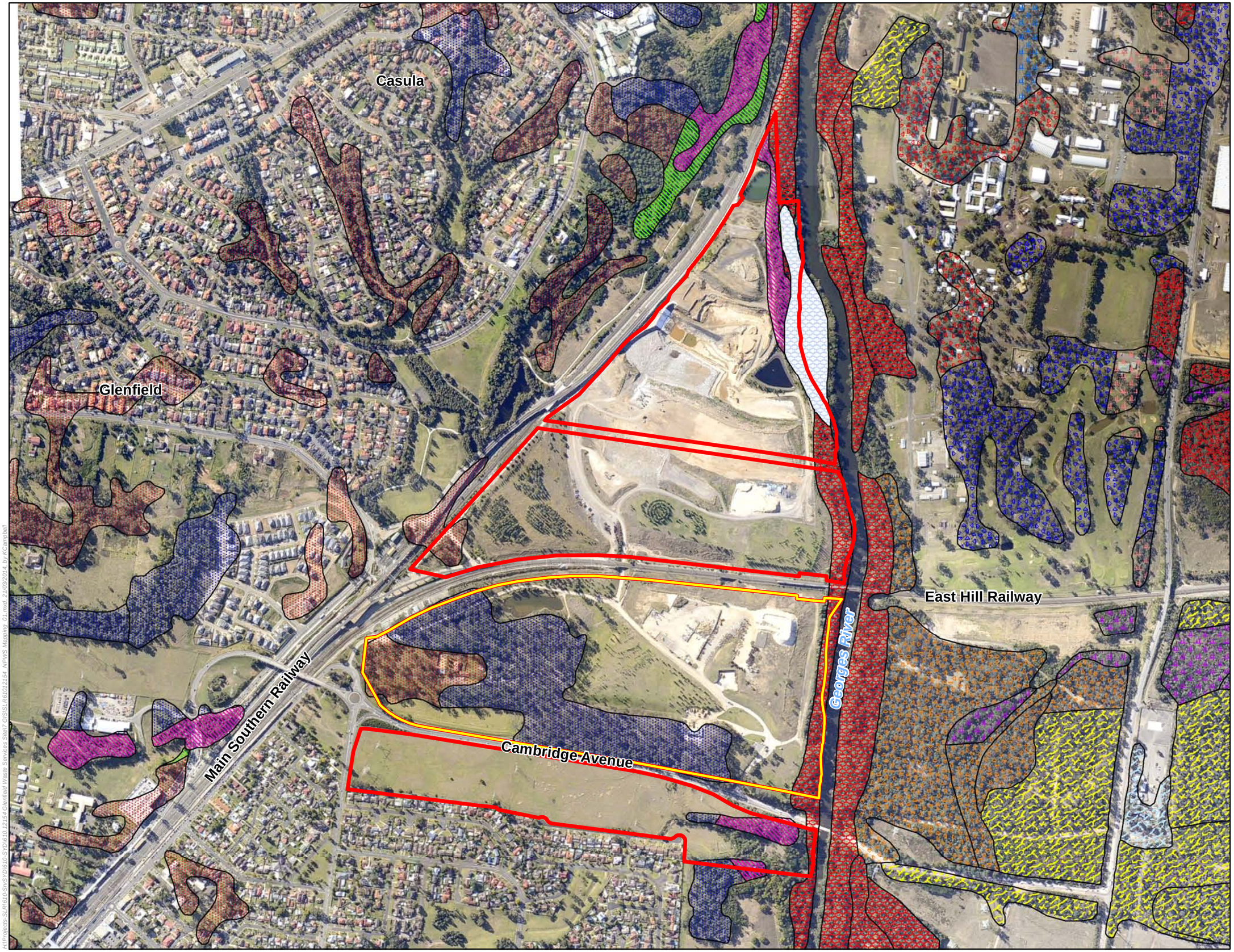
Figure 4 Vegetation mapping by NPWS (2002) of the subject site and surrounds at Glenfield



LEGEND

- Subject Site
- Glenfield Waste Services Site

NPWS Vegetation Mapping

Greater than 10% cover

- 103 - Shale/Gravel Transition Forest
- 6 - Castlereagh Scribbly Gum Woodland
- 4 - Castlereagh Swamp Woodland
- 12 - Riparian Forest
- 3 - Cooks River Castlereagh Ironbark Forest
- Alluvial Woodland
- Shale Plains Woodland

Less than 10% cover

- 4 - Castlereagh Swamp Woodland
- 12 - Riparian Forest
- 3 - Cooks River Castlereagh Ironbark Forest
- Alluvial Woodland
- Shale Plains Woodland

Less than 10% cover and urbanised

- 103 - Shale/Gravel Transition Forest
- 4 - Castlereagh Swamp Woodland
- 12 - Riparian Forest
- 3 - Cooks River Castlereagh Ironbark Forest

0 50 100 200 300
Metres

N

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
3. Map locator courtesy of ESRI 'World Topo Map'
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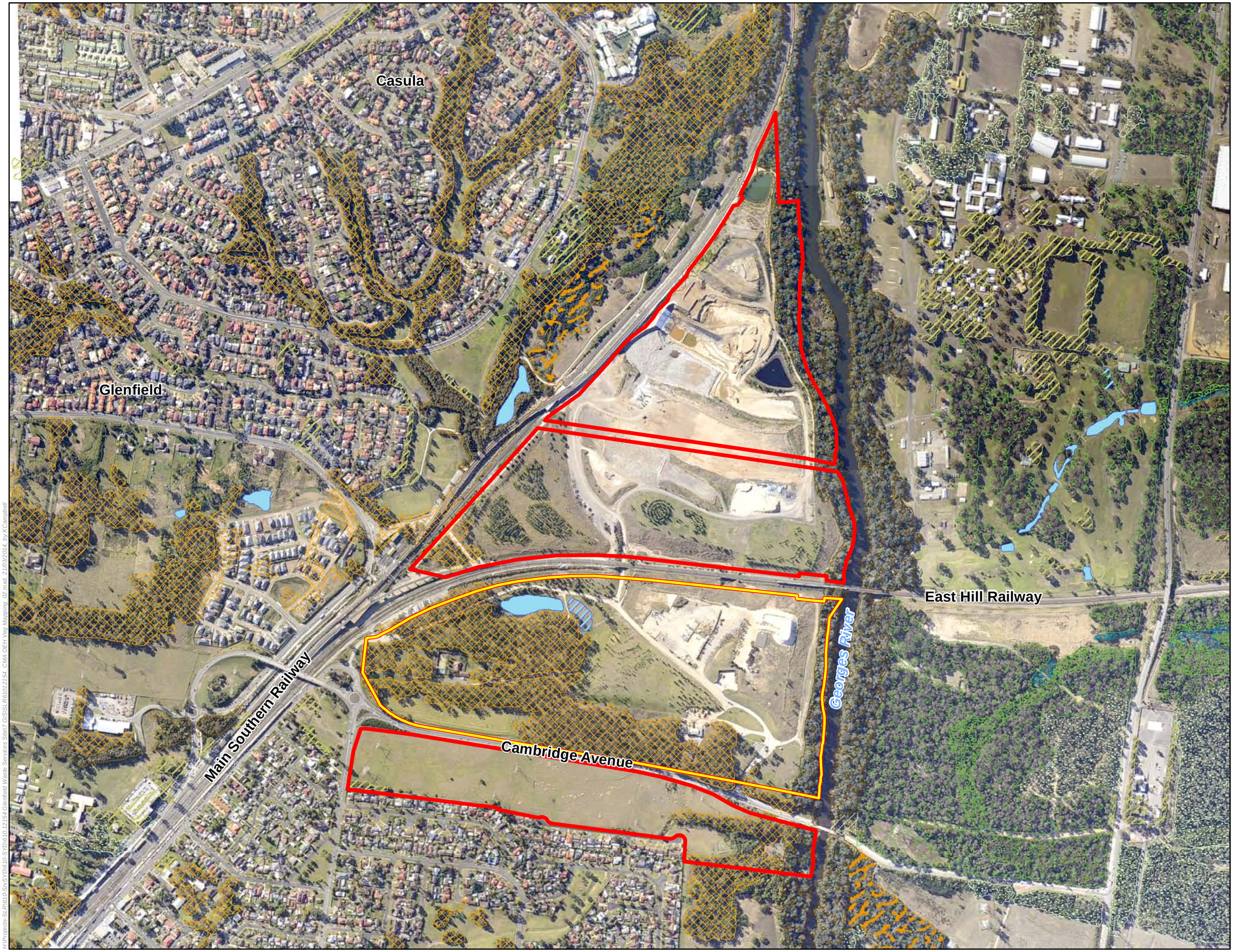
Figure 5 Vegetation mapping by the CMA/OEH (2009) of the subject site and surrounds at Glenfield



LEGEND

- Subject Site
- Glenfield Waste Services Site
- Cumberland Moist Shale Woodland
- Cumberland Shale Plains Woodland
- Castlereagh Shale-Gravel Transition Forest
- Castlereagh Scribbly Gum Woodland
- Castlereagh Swamp Woodland
- Coastal Freshwater Reedland
- Cumberland Riverflat Forest
- Cumberland Swamp Oak Riparian Forest
- Hinterland Flats Eucalypt Forest
- Urban Exotic/Native
- Weeds and Exotics
- Artificial Wetland
- Water

0 50 100 200 300
Metres

N

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
3. Map locator courtesy of ESRI 'World Topo Map'
4. All features are approximate only and subject to detailed survey

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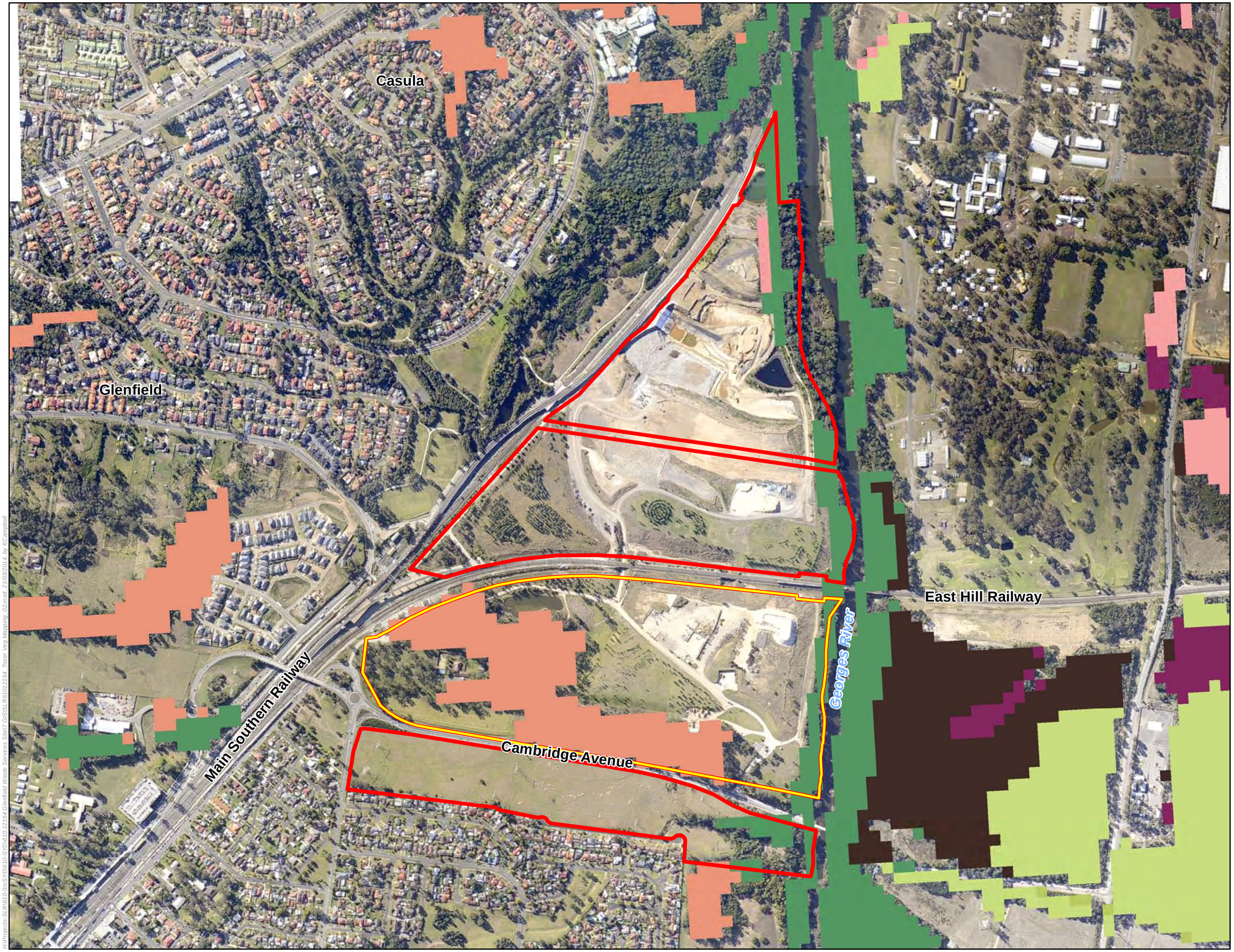
Figure 6 Vegetation mapping by the Tozer (2010) of the subject site and surrounds at Glenfield



LEGEND

- Subject Site
- Glenfield Waste Services Site
- Castlereagh Ironbark Forest
- Castlereagh Scribbly Gum Woodland
- Castlereagh Shale-Gravel Transition Forest
- Castlereagh Swamp Woodland
- Cleared
- Coastal Sandstone Plateau Heath
- Cumberland River Flat Forest
- Cumberland Shale Plains Woodland
- Cumberland Shale Sandstone Transition Forest

0 50 100 200 300
Metres

N

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
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Figure 7 SLR Ecology vegetation condition mapping on the subject site at Glenfield

East Hills Railway

Existing Recycling Facility

Cambridge Avenue

Georges River

Man-made and surrounded by dense Kikuyu

Mowing and weed invasion

Man-made and surrounded by dense Kikuyu

Man-made and surrounded by dense Kikuyu

Weed invasion

Exotic ground cover

Exotic groundcover

Mixed native and exotic groundcover

Exotic groundcover

Cleared understorey and groundcover

Exotic groundcover

Exotic groundcover

Cleared understorey and groundcover

Exotic groundcover

Dense noxious weeds

LEGEND

- Subject Site
- Cadastre

Artificial Cumbungi Wetland

- Very low (1.34Ha)

Grey Box - Red Gum Woodland

- Very Low (3.48Ha)
- Low - Moderate (7.55Ha)

Red Gum - Ironbark Woodland

- Very Low (0.9Ha)
- Low (0.06Ha)
- Moderate (0.63Ha)

Red Gum - Stringybark Riparian Forest

- Very low (1.41Ha)

N

0 50 100

Metres

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
3. Vegetation mapping undertaken by SLR Ecology on the 30th of September and 1st of October 2013
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Figure 8

Priority Conservation Lands

LEGEND

- Glenfield Waste Services Site
- Subject Site
- Priority Conservation Lands

N

0 500 1,000 2,000 3,000

Metres

NOTES

1. Digital cadastral database (DCDB) © 2012 NSW Dept of lands.
2. Aerial imagery courtesy of Nearmap, 14 August 2013
3. Map locator courtesy of ESRI 'World Topo Map'
4. All features are approximate only and subject to detailed survey

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global environmental solutions

Glenfield Waste Services Site
Cambridge Avenue, Glenfield

Proposed Rezoning & Expansion

Cumberland Plain Woodland Assessment Report

Appendix A
Photographs of the Subject Site

March 2014

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 1

- NW – exotic grass area with Grey Box and some Red Gum

Photo Point 2

- S – patch of Cobblers Pegs along fence

Photo Point 3

- Couch Grass along fence

Photo Point 4

- Bund with exotic Nasella Grass ?

Photo Point 5

- NE – highly disturbed groundcover in the vicinity of the compound

Photo Point 6

- Grey Box with highly disturbed groundcover - maintained for asset protection to the landfill

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 7

- NW – from on top of the bund showing the Grey Box with *Melaleuca decora* at this location

Photo Point 8

- W – areas dominated by Weeping Grass

Photo Point 9

- W – asset protection involving complete removal of groundcover for approximately 50m south of the landfill

Photo Point 10

- SW – Grey Box woodland with mixed native and exotic groundcover and colour bond fence along southern boundary (Cambridge Avenue)

Photo Point 11

- W – Grey Box with dry grassy groundcover

Photo Point 12

- N – mesh fence running north-south here. Note – colourbond fence along southern boundary stops at the mesh fence, but bund continues to the west.

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 13

- W – grass is mostly Weeping Grass at this point

Photo Point 14

- W – paddock wire fencing to the mesh fence

Photo Point 15

- NW - all exotic grass

Photo Point 16

- W – almost entirely exotic grasses

Photo Point 17

- Grey Box trees with exotic grasses

Photo Point 18

- Grey Box trees with Kikuyu and Couch

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 19

- W - Grey Box trees with exotic grasses and weeds

Photo Point 20

- NW - Grey Box trees with exotic grasses (mainly Kikuyu) and row of planted Swamp Oaks at entrance gates

Photo Point 21

- E – Driveway planted out with exotic deciduous trees

Photo Point 22

- S – planted trees

Photo Point 23

- NE – paddock of exotic lawn grass with Grey Box, Narrow-leaved Ironbark and Stringybark

Photo Point 24

- NW – small wedge of regrowth eucalypts, Wattles and Weeping Grass

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 25

- E – exotic lawn

Photo Point 26

- SW - Exotic paddock

Photo Point 27

- E – mainly exotic grasses

Photo Point 28

- E – two rows of planted Swamp Oaks

Photo Point 29

- SE – Grey Box with mixed native/exotic grassland

Photo Point 30

- S – exotic lawn with scattered trees in the vicinity of the house

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 31

- S – Grey Box with mixed native/exotic grassland

Photo Point 32

- NE – Grey Box with mixed native/exotic grassland

Photo Point 33

- S – fairly exotic grass cover along this boundary where it is lower lying

Photo Point 34

- W – band of regrowth and/or planted eucalypts and Swamp Oaks with exotic grass and weeds

Photo Point 35

- Exotic lawn grass and plantings

Photo Point 36

- NW – drainage channel enters site from under train line and flows south to artificial wetland

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 37

- SE – artificial wetland with Cumbungi

Photo Point 38

- NE – Red Gum, Stringybark, Ironbark and Rough-barked Apple with some native understorey and mown mixed native/exotic grassland

Photo Point 39

- W – moderate condition CPW vegetation, which is highly diverse but mown, with some weed invasion

Photo Point 40

- E – lower slope is exotic

Photo Point 41

- W – artificial wetland with exotic grasses and weeds around edges

Photo Point 42

- N – riparian Red Gum and Stringybark with Wattles, African Olive and Lantana

Appendix A Photographs from the site on the 30th of September and 1st of October 2013.

Photo Point 43

- NE – riparian vegetation is highly disturbed by weed invasion and rubbish

Photo Point 44

- S – Georges River

Photo Point 45

- N – riparian vegetation with similar dry CPW species to the remainder of the site

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Glenfield Waste Services Site
Cambridge Avenue, Glenfield

Proposed Rezoning & Expansion

Cumberland Plain Woodland Assessment Report

Appendix B
Final Determination for CPW

March 2014

Environment & Heritage

You are here: Home > Threatened species > Scientific Committee > Determinations

Cumberland Plain Woodland in the Sydney Basin Bioregion - critically endangered ecological community listing

NSW Scientific Committee - final determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list the Cumberland Plain Woodland in the Sydney Basin Bioregion as a CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY in Part 2 of Schedule 1A of the Act and as a consequence, to omit reference to Cumberland Plain Woodland from Part 3 of Schedule 1 (Endangered Ecological Communities) of the Act. The listing of Critically Endangered Ecological Communities is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. Cumberland Plain Woodland was listed as an Endangered Ecological Community under the *Threatened Species Conservation Act* 1995 in June 1997 (NSW Scientific Committee 1997). Since this listing, a large volume of new data and analyses have become available. In addition, a nomination to change the status of Cumberland Woodland to Critically Endangered status has been received. This Determination addresses additional information now available in accordance with current listing criteria under the *Threatened Species Conservation Regulation* 2002.

2. Cumberland Plain Woodland is the name given to the ecological community in the Sydney Basin bioregion associated with clay soils derived from Wianamatta Group geology, or more rarely alluvial substrates, on the Cumberland Plain, a rainshadow area to the west of Sydney's Central Business District. The mean annual rainfall of this area is typically in the range of 700-900 mm, and is generally lower than that received on more elevated terrain that partially surrounds the Plain. The community typically occurs on flat to undulating or hilly terrain up to about 350 m elevation but may also occur on locally steep sites and at slightly higher elevations. Cumberland Plain Woodland is characterised by the assemblage of species listed in paragraph 3 and typically comprises an open tree canopy, a near-continuous groundcover dominated by grasses and herbs, sometimes with layers of shrubs and/or small trees. Shrubs may sometimes occur in locally dense stands. Less disturbed stands of the community may have a woodland or forest structure. Small trees or saplings may dominate the community in relatively high densities after partial or total clearing, and the groundcover may be relatively sparse, especially where densities of trees or shrubs are high. The community also includes 'derived' native grasslands which result from removal of the woody strata from the woodlands and forests.

3. Cumberland Plain Woodland is characterised by the following assemblage of species:

Acacia implexa	*Ajuga australis*
Aristida ramosa	*Aristida vagans*
Arthropodium milleflorum	*Arthropodium minus*
Asperula conferta	*Austrodanthonia caespitosa*
Austrodanthonia racemosa var. *racemosa*	*Austrodanthonia tenuior*
Bossiaea prostrata	*Bothriochloa decipiens*
Bothriochloa macra	*Brunoniella australis*
Bursaria spinosa	*Carex inversa*
Centaurium spicatum	*Centella asiatica*
Cheilanthes distans	*Cheilanthes sieberi* subsp. *sieberi*
Chloris truncata	*Chloris ventricosa*
Chorizema parviflorum	*Chrysocephalum apiculatum*
Clematis glycinoides var. *glycinoides*	*Commelina cyanea*
Crassula sieberiana	*Cymbonotus lawsonianus*
Cymbopogon refractus	*Cyperus gracilis*
Daucus glochidiatus	*Daviesia ulicifolia*

Desmodium brachypodium	*Desmodium varians*
Dianella longifolia	*Dichanthium sericeum*
Dichelachne micrantha	*Dichelachne parva*
Dichondra repens	*Dichopogon fimbriatus*
Dichopogon strictus	*Digitaria diffusa*
Dillwynia sieberi	*Dodonaea viscosa* subsp. *cuneata*
Echinopogon caespitosus var. *caespitosus*	*Echinopogon ovatus*
Einadia hastata	*Einadia nutans*
Einadia polygonoides	*Einadia trigonos*
Elymus scaber var. *scaber*	*Eragrostis leptostachya*
Eremophila debilis	*Eriochloa pseudoacrotricha*
Eucalyptus crebra	*Eucalyptus eugenioides*
Eucalyptus moluccana	*Eucalyptus tereticornis*
Euchiton sphaericus	*Exocarpus cupressiformis*
Fimbristylis dichotoma	*Galium migrans*
Galium propinquum	*Geranium homeanum*
Geranium solanderi var. *solanderi*	*Glossogyne tannensis*
Glycine clandestina	*Glycine microphylla*
Glycine tabacina	*Goodenia hederacea subsp. hederacea*
Hardenbergia violacea	*Hypericum gramineum*
Hypoxis hygrometrica	*Hypoxis pratensis* var. *pratensis*
Indigofera australis	*Juncus usitatus*
Lachnagrostis avenacea var. avenacea	*Lomandra filiformis* subsp. *filiformis*
Lomandra multiflora subsp. *multiflora*	*Mentha diemenica*
Microlaena stipoides var. *stipoides*	*Opercularia diphylla*
Oxalis perennans	*Panicum effusum*
Paspalidium distans	*Phyllanthus virgatus*
Plantago debilis	*Plantago gaudichaudii*
Plectranthus parviflorus	*Poa labillardieri* var. *labillardieri*
Pratia purpurascens	*Pultenaea microphylla*
Rubus parvifolius	*Scleria mackaviensis*
Scutellaria humilis	*Senecio diaschides*
Senecio hispidulus var. *hispidulus*	*Sida corrugata*
Solanum cinereum	*Solanum prinophyllum*
Sorghum leiocladum	*Sporobolus creber*
Sporobolus elongatus	*Stackhousia viminea*
Themeda australis	*Tricoryne elatior*
Vernonia cinerea var. cinerea	*Veronica plebeia*
Wahlenbergia gracilis	*Wahlenbergia stricta subsp. stricta*
Wurmbea dioica subsp. dioica	*Zornia dyctiocarpa var. dyctiocarpa*

Other tree species occurring less frequently in this community include:

Angophora bakeri	*Angophora floribunda*
Angophora subvelutina	*Corymbia maculata*
Eucalyptus amplifolia	*Eucalyptus baueriana*
Eucalyptus bosistoana	*Eucalyptus fibrosa*
Eucalyptus globoidea	*Eucalyptus longifolia*
Eucalyptus paniculata	*Eucalyptus punctata*
Syncarpia glomulifera	

4. The total species list of the community is larger than that given above, with many species present in only one or two sites or in low abundance. The species composition of a site will be influenced by the size of the site, recent rainfall or drought conditions and by its disturbance (including grazing, land clearing and fire) history. The number and relative abundance of species will change with time since fire, and may also change in response to changes in fire frequency or grazing regime. At any one time, above-ground individuals of some species may be absent, but the species may be represented below-ground in soil seed banks or as dormant structures such as bulbs, corms, rhizomes, rootstocks or lignotubers. Benson and Howell (2002) and Benson & von Richter (2008) document the temporal variability in the species composition of the community. The list of species given above is mainly of vascular plant species, however the community also includes micro-organisms, fungi, cryptogamic plants and a diverse fauna, both vertebrate and invertebrate. The mammalian and avian components of the fauna have been described by Leary (*in litt*. August 2007) and Farrell (in litt. June 2007). Other components of the community are poorly documented (although see Benson & von Richter 2008).

5. Cumberland Plain Woodland is characterised by an upper-storey that is usually dominated by *Eucalyptus moluccana* (Grey Box) and *E. tereticornis* (Forest Red Gum), often with *E. crebra* (Grey Ironbark), *E. eugenioides* (Narrow-leaved Stringybark), *Corymbia maculata* (Spotted Gum) or other less frequently occurring eucalypts, including *Angophora floribunda, A. subvelutina* (Broad-leaved Apple), *E. amplifolia* (Cabbage Gum) and *E. fibrosa* (Broad-leaved Ironbark). The community may have an open stratum of small trees that may include any of these eucalypts, as well as species such as *Acacia decurrens* (Black Wattle), *A. parramattensis* (Parramatta Wattle), *A.implexa* (Hickory Wattle) or *Exocarpos cupressiformis* (Native Cherry). Shrubs are typically scattered in the understorey but may be absent or locally dense as a result of clearing activity or changes in grazing or fire regimes. *Bursaria spinosa* (Blackthorn) is usually dominant, while other species include *Daviesia ulicifolia* (Gorse Bitter Pea), *Dillwynia sieberi, Dodonaea viscosa* subsp. *cuneata* and *Indigofera australis* (Native Indigo). The ground cover is dominated by a diverse range of grasses including *Aristida ramosa* (Purple Wiregrass), *A. vagans* (Threeawn Speargrass), *Cymbopogon refractus* (Barbed Wire Grass), *Dichelachne micrantha* (Plumegrass), *Echinopogon caespitosus* (Forest Hedgehog Grass), *Eragrostis leptostachya* (Paddock Lovegrass), *Microlaena stipoides* (Weeping Grass), *Paspalidium distans* and *Themeda australis* (Kangaroo Grass), and with graminoids *Carex inversa* (Knob Sedge), *Cyperus gracilis, Lomandra filiformis* subsp. *filiformis* (Wattle Mat-rush) and *L. multiflorus* subsp. *multiflorus* (Many-flowered Mat-rush). The ground cover also includes a diversity of forbs such as *Asperula conferta* (Common Woodruff), *Brunoniella australis* (Blue Trumpet), *Desmodium varians* (Slender Tick Trefoil), *Dianella longifolia* (Blue Flax Lily), *Dichondra repens* (Kidney Weed), *Opercularia diphylla*, *Oxalis perennans* and *Wahlenbergia gracilis* (Australian Bluebell), as well as scramblers, *Glycine* spp. and *Hardenbergia violacea* (Native Sarsaparilla) and the fern *Cheilanthes sieberi* (Poison Rock Fern).

6. The structure of the community varies depending on past and current disturbances, particularly clearing, fire and grazing. Contemporary tree-dominated stands of the community are largely relics or regrowth of originally taller forests and woodlands, which are likely to have had scattered shrubs and a largely continuous grassy groundcover. At some sites, mature trees may exceed 30m tall, although regrowth stands may be shorter than 10 m tall. After total or partial clearing, the tree canopy may remain sparse or may regrow to form dense stands of saplings and small trees, which are typically associated with a ground layer of reduced cover and diversity. Either or both of the upper-storey and mid-storey may be absent from the community. Native grasslands derived from clearing of the woodland and forest are also part of this community if they contain characteristic non-woody species listed in paragraph 3.

7. Cumberland Plain Woodland includes: 'Shale Hills Woodland' (map unit 9) and 'Shale Plains Woodland' (map unit 10) of Tozer (2003); 'Spotted Gum Forest' (map unit 9b), 'Grey Box Woodland' (map unit 10c) and 'Grey Box – Ironbark Woodland' (map unit 10d) of Benson (1992); and 'Cumberland Plain Woodlands' of Benson & Howell (1990a; b). Tindall *et al*. (2004) and Tozer *et al*. (2006) subsequently reproduced Tozer's (2003) classification and mapping, re-labelling map units 9 and 10 as 'Cumberland Shale Hills Woodland' (map unit GW p28) and 'Cumberland Shale Plains Woodland' (map unit GW p29), respectively. Cumberland Plain Woodland belongs to the Coastal Valley Grassy Woodlands vegetation class (Keith 2004).

8. Several other ecological communities listed under the *Threatened Species Conservation Act* 1995 may intergrade with Cumberland Plain Woodland. These include Cooks River/ Castlereagh Ironbark Forest in the Sydney Basin Bioregion; Moist Shale Woodland in the Sydney Basin Bioregion; Shale / Sandstone Transition Forest; Shale Gravel Transition Forest in the Sydney Basin Bioregion; and Sydney Turpentine-Ironbark Forest. While Tozer (2003) provides information on the features that distinguish these communities, some transitional stands will be difficult to assign to a single community with a high level of confidence (Keith 2009). Transitional stands between Cumberland Plain Woodland and other communities listed under the *Threatened Species*

Conservation Act 1995 are considered part of a listed community, and should be assigned to the community with which they share greatest resemblance in species composition and other properties.

9. Cumberland Plain Woodland in the Sydney Basin Bioregion is included within the critically endangered ecological community listed under the *Environment Protection and Biodiversity Conservation Act* as "Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest". However the Commonwealth listing advice excludes some patches, here regarded as Cumberland Plain Woodland, on the basis of condition or structure thresholds.

10. The following threatened species have been recorded from Cumberland Plain Woodland:

Invertebrates

Cumberland Land Snail	*Meridolum corneovirens*	Endangered

Birds

Gang Gang Cockatoo	*Callocephalon fimbriatum*	Vulnerable
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	Vulnerable
Brown Treecreeper	*Climacteris picumnus*	Vulnerable
Painted Honeyeater	*Grantiella picta*	Vulnerable
Swift Parrot	*Lathamus discolor*	Endangered
Square-tailed Kite	*Lophoictinia isura*	Vulnerable
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	Vulnerable
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Vulnerable
Turquoise Parrot	*Neophema pulchella*	Vulnerable
Barking Owl	*Ninox connivens*	Vulnerable
Powerful Owl	*Ninox strenua*	Vulnerable
Speckled Warbler	*Pyrrholaemus sagittatus*	Vulnerable
Diamond Firetail	*Stagonopleura guttata*	Vulnerable
Masked Owl	*Tyto novaehollandiae*	Vulnerable
Sooty Owl	*Tyto tenebricosa*	Vulnerable
Regent Honeyeater	*Xanthomyza phrygia*	Endangered

Mammals

Large-eared Pied Bat	*Chalinolobus dwyeri*	Vulnerable
Spotted-tail Quoll	*Dasyurus maculata*	Vulnerable
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	Vulnerable
Eastern Bent-wing Bat	*Miniopterus schreibersii*	Vulnerable
Eastern Freetail Bat	*Mormopterus norfolkensis*	Vulnerable
Southern Myotis	*Myotis macropus*	Vulnerable
Yellow-bellied Glider	*Petaurus australis*	Vulnerable
Squirrel Glider	*Petaurus norfolkensis*	Vulnerable
Koala	*Phascolarctos cinereus*	Vulnerable
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable
Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventris*	Vulnerable
Greater Broad-nosed Bat	*Scoteanax rueppellii*	Vulnerable

Plants

Downy Wattle	*Acacia pubescens*	Vulnerable
Juniper-leaved Grevillea	*Grevillea juniperina* subsp. *juniperina*	Vulnerable
Native Pear	*Marsdenia viridiflora* subsp. *viridiflora*	Endangered Population
Narrow-leaved Geebung	*Persoonia nutans*	Endangered
Spiked Riceflower	*Pimelea spicata*	Endangered
Matted Bush-pea	*Pultenaea pedunculata*	Endangered
Sydney Plains Greenhood	*Pterostylis saxicola*	Endangered

11. Cumberland Plain Woodland is restricted to the Sydney Basin Bioregion (*sensu* Thackway and Cresswell) and is currently known to occur within the local government areas of Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly, but may occur elsewhere within the bioregion. Using map data from Tozer (2003), Cumberland Plain Woodland was estimated to occur within an extent of occurrence of 2810 km2, and an area of occupancy of just under 2 100 km2 based on 2 x 2 km grid cells, the spatial scale recommended by IUCN (2008) for assessing areas of occupancy for species.

12. Small areas of Cumberland Plain Woodland have been recorded from Kemps Creek, Mulgoa and Windsor Downs Nature Reserves, Scheyville National Park, and Leacock, Rouse Hill and Western Sydney Regional Parks.

13. Based on aerial photography flown in November 1998, Tozer (2003) estimated the total extent of woody vegetation referred to as Cumberland Plain Woodland was 11 054 (±1 564) ha (upper and lower plausible bounds, *sensu* Keith et al. 2009), representing 8.8 (±1.2)% of the pre-European distribution of the community. Patches of the community lacking woody vegetation are very small in extent and can be considered to be included within the plausible bounds. For that part of the community's distribution to the east of the Hawkesbury-Nepean River, earlier mapping at coarser resolution by Benson & Howell (1990b) suggests a similar level of depletion, with an estimated 6 420 ha of 'Cumberland Plain Woodlands', representing 6% of the pre-European distribution east of the Hawkesbury-Nepean River. An update of Tozer's (2003) map, based on interpretation of imagery flown in January-March 2007 shows that the extent of Cumberland Plain Woodland east of the Hawkesbury – Nepean River had declined by 442±46 ha, a reduction of 5.2±0.6% in 9 years (NSW Scientific Committee & Simpson 2008). These estimates indicate that the geographic distribution of the community has undergone a very large reduction over a time frame appropriate to the life cycle and habitat characteristics of its component species.

14. Some areas of Cumberland Plain Woodland subjected to a history of partial clearing and grazing have recently undergone a change in management to conserve the community. Examples include Mt Annan Botanic Garden, Scheyville National Park, Western Sydney Regional Park, Elizabeth Macarthur Agricultural Institute, Orchard Hills Defence Site and the former Australian Defence Industries site at St Marys. Experience from these areas suggests that the community is capable of some recovery, provided the soil has not been disturbed by earthworks, cultivation, fertiliser application or other means of nutrient or moisture enrichment (Benson & Howell 2002; Pellow 2003; Keith *et al*. 2005; J. Howell *in litt*. August 2007; J. Sanders *in litt*. January 2008). In contrast, restoration of Cumberland Plain Woodland has proved to be problematic on sites that have been exposed to such soil disturbance. At Western Sydney Regional Park, for example, Wilkins *et al*. (2003), Nichols (2005) and Nichols *et al.* (2005) studied the recovery of abandoned pastures that had been planted with more than 20 native tree and shrub species of Cumberland Plain Woodland. Over 10 years they found no evidence of convergence in species composition with nearby remnant stands of the community and the species composition of restored areas remained indistinguishable from untreated pastures. There was some evidence that restored vegetation had begun to develop more species-rich assemblages of moths and butterflies compared to untreated pastures, although after 10 years, it lacked a number of species characteristic of remnant woodland (Lomov *et al.* 2006). Ant communities also showed marked differences between restored and remnant vegetation although some ecological processes, such as pollination and seed dispersal, showed some evidence of development at restored sites (Lomov 2005). These results suggest that sites with a history of soil disturbance will be extremely slow to recover characteristics of Cumberland Plain Woodland, if at all, and that experimentation with alternative restoration technologies is required. As a large proportion of the former distribution of the community has either undergone similar histories of soil disturbance or are now occupied by urban development, opportunities for restoration of the community across

significant areas appear limited.

15. The reduction in the geographic distribution of Cumberland Plain Woodland was initially due to tree-felling for timber and clearing for crops and pastures (Benson & Howell 1990a). Benson & Howell (1990b) estimated that the community had been reduced to approximately half of its pre-European extent by 1850. Following World War II, there was a marked acceleration in urban and industrial development, which continues to deplete the distribution of the community to the present day. These trends appear likely to continue into the future as the urban area continues to expand to accommodate Sydney's increasing population, which is projected to grow by 1.0-1.1 million people during the 20 years 2007-2026 and 2.2-3.3 million during the 50 years 2007-2056 (Australian Bureau of Statistics 2008). Recent draft plans to develop growth centres in north-west and south-west Sydney, for example, identify staged release of land for residential and employment development over the next 25 years. These areas contain approximately 2000 ha (one-fifth) of the estimated remaining Cumberland Plain Woodland based on Tozer (2003), of which about two-thirds will be available for development, the loss of which is planned for offsetting through voluntary land acquisition and/or the establishment of conservation agreements on lands outside the Growth Centres (Growth Centres Commission 2007) for the primary purpose of biodiversity conservation. While important examples of Cumberland Plain Woodland are represented within conservation reserves, much of the remaining area of the community occurs on private land or on public easements, where it is at risk from small-scale clearing associated with housing, industrial development and transport infrastructure. There are significant logistic and technological constraints and time lags associated with efforts to restore the community (Wilkins *et al*. 2003; Nichols 2005; Nichols *et al*. 2005). 'Clearing of native vegetation' is listed as a Key Threatening Process under the *Threatened Species Conservation Act* 1995.

16. Fragmentation of habitat associated with clearing has resulted in a very large reduction in the ecological function of Cumberland Plain Woodland. The remaining area of the community is severely fragmented, with more than half of the remaining tree cover mapped by Tozer (2003) occurring in patches of less than 80 ha and half of all mapped patches being smaller than 3 ha (Tozer *in litt*. October 2007). The integrity and survival of small, isolated stands is impaired by the small population size of many species, enhanced risks from environmental stochasticity, disruption to pollination and dispersal of fruits or seeds, and likely reductions in the genetic diversity of isolated populations (Young *et al*. 1996; Young & Clarke 2000). The impacts of fragmentation and associated processes are most evident in the loss of vertebrate fauna from the community (Farrell 2005; Farrell *in litt*. June 2007; Leary 2005; *in litt*, August 2007). As well, some invertebrate species, such as the Endangered Cumberland Land Snail, appear to be in decline, at least in the smaller fragments (M. Shea *in litt*. June 2007). The dieback of eucalypt canopies observed in stands of Cumberland Plain Woodland at Scheyville (D. Keith pers. comm. October 2008) may be a result of complex interactions involving insect attack, weed invasion, nutrient enrichment and drought, in which fragmentation also plays a role (Reid & Landsberg 2000; Wardell-Johnson *et al*. 2006). Despite their history of fragmentation, some very small and apparently degraded remnants may contain a surprisingly high diversity of species and important examples of rare species, particularly plants (James *et al*. 1999; Benson & Keith 1984; McBarron *et al*. 1988; Benson & Howell 1990a; Kirkpatrick & Gilfedder 1995). However, clearing and continuing degradation of these patches reduces the likelihood that all of these species will persist, particularly because a large proportion of species are known from very few locations which are not clustered in predictable ways (Benson & Howell 2002; Tozer 2003). Fragmentation also results in reduced fire frequencies within some patches, which may reduce the viability of some native plant populations, and hence the diversity of species within the patches (Clarke 2000; Watson 2005).

17. Changes in structure contribute to a very large reduction in the ecological function of Cumberland Plain Woodland. Almost all of the remaining area of the community is regrowth forest and woodland from past clearing activities (Benson & Howell 1990a). Mean tree densities in contemporary stands of the community were found to be substantially higher than historical estimates and tree sizes were thought to be smaller (Benson 1992). Large trees approximating the stature of the community prior to European settlement occur very sparsely within remnant patches of vegetation or remain as isolated individuals within paddocks or urban areas. Scheyville National Park, for example, which contains a large remnant of Cumberland Plain Woodland, was extensively logged and partially cleared over many decades prior to its reservation and is thought to contain as few as five large old trees likely to date from pre-European times (J. Sanders, *in litt*. January 2008). Loss of these large trees, which provide habitat resources for a range of fauna, is associated with declines and local extinctions of numerous birds and mammals that were once more common on the Cumberland Plain (Farrell 2005; T. Leary *in litt*. August 2007). Changes in understorey are difficult to assess, as responses to anthropogenic disturbances are confounded with responses to climatic variability (Benson & Howell 2002). Nevertheless, other structural changes to the community include the removal of fallen woody debris and standing dead trees, the removal of woody understorey plants, or conversely the development of regrowth stands with very high densities of eucalypt saplings or shrubs, notably *Bursaria spinosa*, which

may suppress the ground flora. Botanist Allan Cunningham noted high densities of *B. spinosa* in farmland near Liverpool as early as 1817 (Lee 1927; Benson 1992), while similar phases of high shrub abundance have been observed recently at Mt Annan and Scheyville in response to abandonment of farming practices (Benson & Howell 2002; J. Sanders, *in litt.* January 2008). Some areas of the community now devoid of woody plant species may retain a substantial suite of native grasses and herbs in the ground layer. The Orchard Hills Defence Site includes outstanding examples of this phenomenon (Pellow 2003; Keith *et al*. 2005). 'Loss of hollow-bearing trees' and 'Removal of dead wood and dead trees' are listed as Key Threatening Processes under the *Threatened Species Conservation Act* 1995.

18. While a sample of the original fauna of Cumberland Plain Woodland persists, some components have already been lost and others continue to decline (Leary 2005; *in litt*. Aug. 2008). The original mammal fauna of the Cumberland Plain was estimated to include approximately 60 species (NPWS 1997), of which less than 40 were detected in recent intensive surveys and only 14 species are now considered to be relatively common and widespread (Leary 2005; *in litt*. August 2008). The majority of these latter species are micro-bats, while small ground-dwelling mammals are unexpectedly scarce. A systematic survey involving 22 000 trap nights and 14 000 hair tube nights across conservation reserves containing Cumberland Plain Woodland failed to detect any native rodents or dasyurids, except at sites on the periphery of the plain, close to larger vegetated areas on sandstone (Leary 2005; *in litt*. August 2008). Long-nosed Bandicoots have recently been recorded in inner western Sydney (NSW Scientific Committee 2008), but remain scarce and have not been recorded during the systematic fauna surveys of Cumberland Plain Woodland. A number of bird species have also disappeared from or markedly declined on the Cumberland Plain (Keast 1995; Farrell 2005; Leary 2005; *in litt*. August 2008). A sequence of repeated surveys in Scheyville National Park, the largest remnant of Cumberland Plain Woodland, have documented disappearance of the Black-chinned Honeyeater, Brown Treecreeper, Diamond Firetail, Zebra Finch, Hooded Robin, Red-capped Robin, Scarlet Robin, Flame Robin and Black-eared Cuckoo, while declines have been observed in populations of the Speckled Warbler, Fuscous Honeyeater, Jacky Winter, Weebill and Buff-rumped Thornbill (Farrell 2005; *in litt*. June 2008). Repeated surveys of Nurragingy Reserve near Blacktown indicate that all of these species have also been lost from the reserve, except for the Fuscous Honeyeater and Weebill (Farrell 2005; *in litt*. June 2008). Many of these species either feed or nest on or near the ground. Declines of reptiles and amphibians on the Cumberland Plain have been less well documented, but include at least three species of frog, one species of turtle, one skink, possibly two species of goanna and one species of snake (Leary 2005; *in litt*. August 2008). Two species of plants, *Swainsona monticola* and *Thesium australe*, are presumed to have gone extinct in Cumberland Plain Woodland (Benson & Howell 2002), while James *et al*. (1999) list many other species that have undergone substantial declines, including threatened species such as *Acacia pubescens, Pimelea spicata* and *Pterostylis saxicola*. In addition to these losses and declines across a wide range of biota within the community, Benson & Howell (1990a; 2002) describe other changes in species composition that indicate a very large reduction in the ecological function of Cumberland Plain Woodland.

19. Weed invasion also poses a major threat to Cumberland Plain Woodland. While very large numbers of weed species have invaded many different areas of the community, principal weed species include (Benson 1992; Tozer 2003; Benson & von Richter 2008):

Anagallis arvensis	Scarlet Pimpernel
Araujia serciflora	Moth Vine
Asparagus asparagoides	Bridal Creeper
Aster subulatus	Wild Aster, Bushy Starwort
Centaurium tenuiflorum	
Chloris gayana	Rhodes Grass
Cyclospermum leptophyllum	Slender Celery
Cirsium vulgare	Thistle
Conyza sumatrensis	Tall Fleabane
Ehrharta erecta	Panic Veldtgrass
Eragrostis curvula	African Lovegrass
Heliotropium amplexicaule	Blue Heliotrope
Hypochaeris radicata	Catsear
Lantana camara	Lantana
Leontodon taraxacoides subsp. *taraxacoides*	Lesser Hawkbit, Hairy Hawkbit
Ligustrum sinense	Small-leaf Privet
Nassella neesiana	Chilean Needlegrass
Olea europaea subsp. *cuspidata*	African Olive
Paspalum dilatatum	Paspalum

Plantago lanceolata	Lamb's Tongues, Plantain
Richardia stellaris	
Senecio madagascariensis	Fireweed
Setaria gracilis	Slender Pigeon Grass
Sida rhombifolia	Paddy's Lucerne
Solanum spp.	Nightshades
Sonchus oleraceus	Common Sowthistle
Sporobolus africanus	Parramatta Grass

Several of these species, particularly grasses, form a dense ground layer capable of smothering indigenous plants, reducing both reproduction and survival, and inhibiting emergence and establishment of their seedlings. The propagules of weeds are spread into Cumberland Plain Woodland by stormwater, dumping of refuse, frugivorous birds and wind (Benson & Howell 1990b), making it difficult to abate the invasion process, especially for those species capable of establishing in sites that have been exposed to relatively little disturbance (J. Sanders, *in litt.* January 2008). Hill *et al*. (2005) found that high species richness and abundance of weeds was associated with remnants that either had a history of clearing and grazing, were in close proximity to creeks or downslope from sealed roads. They also found some relationship between weeds and elevated total soil phosphorus, conductivity and water retention capacity, but relationships with these soil properties were weak and varied between sites with different types of disturbance history. The dramatic recent expansion of African Olive poses the greatest invasive threat to Cumberland Plain Woodland. Initially introduced to south-western Sydney in the 1820s, it was generally confined to the Camden-Picton area until the 1970s and now occurs frequently throughout the distribution of the community (Tozer 2003; Cuneo & Leishman 2006). Roberts (1999) mapped approximately 1000 ha of Cumberland Plain Woodland (c. 10% of total remaining) which had a dense understorey of African Olive that was visible on aerial photographs flown in November 1997. Tozer (2003) recorded African Olive in 43% of 198 plots surveyed throughout the distribution of Cumberland Plain Woodland. Cuneo *et al*. (2009) found that 837 ha of Cumberland Plain Woodland in south-west Sydney was invaded by African Olive (8.5% of the area assessed). The species is highly fecund, with fleshy fruit spread widely by a range of frugivorous birds, and seedlings establish readily in relatively undisturbed bushland, as well as fragmented edges (Cuneo & Leishman 2006). As shrubs grow, their canopies cast deep shade and suppress and ultimately eliminate most native shrub and groundcover species. Cook *et al*. (2005) and Tozer (*in litt*. October 2007, based on data from Tozer 2003), both recorded strong inverse relationships between the cover abundance of African Olive and the diversity and cover of native ground layer species. Other weeds that pose future threats to the community include *Ailanthus altissima, Asparagus asparagoides, Acer negundo, Gleditsia triacanthos* and *Macfadyena unguis-cati* (Benson & Howell 2002; J. Howell *in litt*. August 2007; J. Sanders *in litt*. January 2008; L. Harrold pers comm. 2009). The invasion and establishment of exotic weeds is resulting in a very large reduction in the ecological function of Cumberland Plain Woodland. 'Invasion of exotic perennial grasses' and 'Invasion and establishment of exotic vines and scramblers' are listed as Key Threatening Processes under the *Threatened Species Conservation Act* 1995.

20. Moderate to heavy grazing of Cumberland Plain Woodland by livestock and rabbits results in the decline and disappearance of palatable plant species, including shrubs and herbs, and compaction and erosion of topsoil, making re-establishment of a diverse native understorey problematic. The effects of such overgrazing may be exacerbated under drought conditions. Habitat degradation associated with overgrazing and erosion contributes to a large reduction in ecological function of the community.

21. The soils of Cumberland Plain Woodland have undergone chemical and structural modification associated with agricultural land uses. Trampling by livestock has resulted in localised areas of soil compaction, primarily around watering points. Research carried out at the University of Western Sydney found that mean soil inorganic nitrogen levels were two to three times higher in areas of former agricultural land use than in remnant woodland, but was unable to detect differences in other soil properties (E. C. Morris *in litt*. June 2007). Addition of carbon and burning reduced soil inorganic nitrogen and reduced growth of exotic ground layer species relative to native species, suggesting that elevated soil inorganic nitrogen could favour exotics to the detriment of natives in Cumberland Plain Woodland (E. C. Morris *in litt*. June 2007). Hill *et al*. (2005) found elevated levels of phosphorus and conductivity in former agricultural areas compared to remnant woodland, but did not examine soil nitrogen. The sources of nutrient addition to soils of Cumberland Plain Woodland include addition of fertilisers during previous agricultural land use, deposition of livestock dung, rubbish dumping and stormwater runoff from urban areas. Expansion of urban land uses across the Cumberland Plain is likely to increase urban runoff from sealed surfaces into remaining bushland fragments, resulting in further nutrient enrichment of soils and associated replacement of native

flora by exotic species. Disruption of ecological processes and degradation of habitat associated with nutrient enrichment contributes to a very large reduction in ecological function of the community.

22. Fire regimes influence the plant species composition and vegetation structure of Cumberland Plain Woodland (Benson & Howell 2002; Watson 2005) and are also likely to influence other components of the biota. Based on a study of Cumberland Plain Woodland remnants with varying fire histories, Watson (2005) found that variable intervals of 4 - 12 years between successive fires are likely to maintain populations of most understorey species in the community, including resprouting and obligate-seeding shrubs, grasses and herbs. Fragmentation of Cumberland Plain Woodland may exclude fire from some patches for extended periods by reducing fire spread. The consequent reduction in fire frequency sometimes leads to increased dominance of shrubs and associated declines in diversity of grasses and herbs (Watson 2005), as well as increased abundance of woody exotic species, such as African Olive (Benson & Howell 2002; Watson 2005; von Richter *et al*. 2005), which is likely to further reduce the flammability of the community. Conversely, high frequencies of fires may result where fragmentation increases the interface between urban areas and bushland, as this results in increased arson, car dumping, planned fuel-reduction fires and accidental ignitions. High fire frequencies are associated with reduced diversity of native plant species in Cumberland Plain Woodland (Watson 2005). 'High frequency fire resulting in disruption of life cycle processes in plants and animals and loss of vegetation structure and composition' is listed as a Key Threatening Process under the *Threatened Species Conservation Act* 1995. The season of fire, which may be altered as a consequence of hazard reduction fires, may also influence the species composition of the grassy woodland understorey (Knox & Clarke 2006; Benson & von Richter 2008). Disruption of ecological processes associated with alteration of fire regimes contributes to a very large reduction in ecological function of the community.

23. Cumberland Plain Woodland in the Sydney Basin Bioregion is eligible to be listed as a Critically Endangered Ecological Community as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation* 2002:

Clause 25

The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:

(a) a very large reduction in geographic distribution.

Clause 27

The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:

(a) a very large reduction in ecological function,

as indicated by any of the following:

(d) a change in community structure

(e) a change in species composition

(f) disruption of ecological processes

(g) invasion and establishment of exotic species

(h) degradation of habitat

(i) fragmentation of habitat.

Dr Richard Major

Chairperson

Scientific Committee

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Glenfield Waste Services Site
Cambridge Avenue, Glenfield

Proposed Rezoning & Expansion

Cumberland Plain Woodland Assessment Report

Appendix C
Flora Species List

March 2014

Appendix C Flora surveyed from the site on the 23rd and 24th of September 2013.

KEY	
Symbol	**Description**
Status	
*	Exotic species
**	Noxious species declared in the Campbelltown LGA
+	Native but not endemic
CPW	Species is listed as "*characteristic*" within the *Final Determination* (Scientific Committee 2009) for the Cumberland Plain Woodland (CPW), which is listed as a "*critically endangered ecological community*" on the TSC Act and *Environmental Protection & Biodiversity Conservation Act* 1999 (EPBC Act)
Location	- the location of a species record where habitat was restricted on the subject site at Glenfield
MC	Species detected only in the more floristically diverse area of 'Moderate Condition' woodland along the northern boundary
GR	Species detected within the riparian vegetation along the 'Georges River'
AW	Species detected within the 'Artificial Wetlands' near the northern boundary
Frequency	- the frequency at which each species was observed across the subject site at Glenfield
C	Common
M	Moderately common
U	Uncommon
R	Rare

Status	Species name	Common name	Location	Frequency
	Acanthaceae			
CPW	*Brunoniella australis*	Blue Trumpet		C
	Amaranthaceae			
	Alternanthera denticulata	Lesser Joyweed		U
	Antheriaceae			
CPW	*Arthropodium milleflorum*	Pale Vanilla-lily		M
CPW	*Arthropodium minus*	-		U
	Apiaceae			
*	*Foeniculum vulgare*	Fennel		R
	Apocynaceae			
*	*Araujia sericifera*	Moth Vine		M
*	*Gomphocarpus fruticosus*	Narrow-leaved Cotton Bush		R
*	*Vinca major*	Greater Periwinkle		R
	Arecaceae			
*	*Phoenix canariensis*	Canary Island Date Palm		U
	Asparagaceae			
*	*Asparagus aethiopicus*	Asparagus 'Fern'		U
**	*Asparagus asparagoides*	Bridal Creeper		M
*	*Asparagus officinalis*	Asparagus		R

Appendix C Flora surveyed from the site on the 23rd and 24th of September 2013.

Status	Species name	Common name	Location	Frequency
	Asteraceae			
*	*Arctotheca calendula*	Capeweed		R
*	*Bidens pilosa*	Cobblers Peg		C
*	*Cirsium vulgare*	Spear Thistle		M
*	*Conyza bonariensis*	Flaxleaf Fleabane		R
*	*Delairea odorata*	Cape Ivy	GR	U
CPW	*Euchiton sphaericus*	-	MC	R
*	*Gamochaeta calviceps*	Cudweed		U
*	*Gamochaeta purpurea*	Purple Cudweed		U
*	*Hypochaeris radicata*	Catsear		M
**	*Onopordum acanthium*	Scotch Thistle		U
	Ozothamnus diosmifolius	White Dogwood	MC	R
*	*Senecio madagascariensis*	Fireweed		M
	Seneico quadridentatus	Cotton Fireweed		R
*	*Sonchus oleraceus*	Common Sowthistle		U
*	*Taraxacum officinale*	Dandelion		M
CPW	*Vernonia cinerea*	-		U
	Vittadinia cuneata	Fuzzweed	MC	R
	Brassicaceae			
*	*Lepidium africanum*	-		R
	Cactaceae			
**	*Opuntia stricta*	Common Prickly Pear		R
	Campanulaceae			
CPW	*Wahlenbergia stricta* subsp. *stricta*	Tall Bluebell	MC	R
	Caryophyllaceae			
*	*Cerastium glomeratum*	Mouse-ear Chickweed		M
*	*Petrorhagia velutina*	-		C
	Casuarinaceae			
+	*Casuarina glauca*	Swamp Oak		U
	Celastraceae			
	Maytenus silvestris	Narrow-leaved Orangebark	GR	R
	Chenopodiaceae			
CPW	*Einadia hastata*	Berry Saltbush		C
CPW	*Einadia nutans* subsp. *linifolia*	-		C
CPW	*Einadia trigonos*	Fishweed		C
	Clusiaceae			
**	*Hypericum perforatum*	St. Johns Wort		U
	Commelinaceae			
CPW	*Commelina cyanea*	Native Wandering Jew		R
*	*Tradescantia fluminensis*	Wandering Jew	GR	C
	Convolvulaceae			
	Convolvulus erubescens	Blushing Bindweed		R
CPW	*Dichondra repens*	Kidney Weed		C
	Crassulaceae			
**	*Bryophyllum delagoense*	Mother-of-millions		U

Appendix C Flora surveyed from the site on the 23rd and 24th of September 2013.

Status	Species name	Common name	Location	Frequency
	Fabaceae – Faboideae			
CPW	*Bossiaea prostrata*	-	MC	R
CPW	*Chorizema parviflorum*	Eastern Flame Pea	MC	R
CPW	*Daviesia ulicifolia*	Gorse Bitter Pea	MC	R
CPW	*Dillwynia sieberi*	-	MC	R
CPW	*Glycine clandestina*	-		M
CPW	*Glycine tabacina*	-		M
CPW	*Hardenbergia violaceae*	False Sarsaparilla	MC	R
CPW	*Indigofera australis*	Australian Indigo		R
*	*Lotus angustissimus*	Slender Birds-foot Trefoil		M
*	*Trifolium arvense*	Haresfoot Clover		M
*	*Trifolium repens*	White Clover		M
*	*Vicia sativa* subsp. *nigra*	Narrow-leaved Vetch		M
	Fabaceae – Mimosoideae			
	Acacia binervia	Coast Myall	GR	M
	Acacia decurrens	Black Wattle		M
	Acacia parramattensis	Parramatta Wattle		U
	Lamiaceae			
CPW	*Plectranthus parviflorus*	Cockspur Flower		U
	Lauraceae			
**	*Cinnamomum camphora*	Camphor Laurel		R
	Linaceae			
*	*Linum trigynum*	French Flax		U
	Lomandraceae			
CPW	*Lomandra multiflora*	Many-flowered Mat-rush	MC	U
	Loranthaceae			
	Amyema miquelii	-		U
	Malvaceae			
*	*Modiola caroliniana*	Red-flowered Mallow		C
*	*Sida rhombifolia*	Paddy's Lucerne		C
	Myrsinaceae			
*	*Anagallis arvensis*	Scarlet Pimpernel		C
	Myrtaceae			
CPW	*Angophora floribunda*	Rough-barked Apple	MC	R
+	*Corymbia maculata*	Spotted Gum		R
CPW	*Eucalyptus crebra*	Narrow-leaved Ironbark		U
CPW	*Eucalyptus eugenioides*	Thin-leaved Stringybark		U
CPW	*Eucalyptus moluccana*	Grey Box		C
CPW	*Eucalyptus tereticornis*	Forest Red Gum		M
+	*Lophostemon confertus*	Brush Box		R
	Melaleuca decora	-		M
	Oleaceae			
**	*Ligustrum lucidum*	Large-leaved Privet		M
**	*Ligustrum sinense*	Small-leaved Privet		C
**	*Olea europaea* subsp. *cuspidata*	African Olive		C
	Onagraceae			
	Ludwigia peploides subsp. *montevidensis*	Water Primrose	AW	M
	Oxalidaceae			
CPW	*Oxalis perennans*	-	MC	R

Appendix C Flora surveyed from the site on the 23rd and 24th of September 2013.

Status	Species name	Common name	Location	Frequency
	Phormiaceae			
CPW	*Dianella longifolia*	Blueberry Lily		U
	Dianella revoluta	Blueberry Lily		U
	Pinaceae			
*	*Pinus radiata*	Radiata Pine		R
	Pittosporaceae			
	Billardiera scandens	Hairy Apple Berry	GR	R
CPW	*Bursaria spinosa*	Blackthorn		C
	Plantaginaceae			
*	*Plantago lanceolata*	Lamb's Tongue		C
	Poaceae			
CPW	*Aristida ramosa*	Purple Wire Grass	MC	R
CPW	*Aristida vagans*	Threeawn Spear Grass		R
	Austrostipa ramosissima	Stout Bamboo Grass		C
*	*Avena barbata*	Bearded Oats		M
*	*Briza subaristida*	-		U
*	*Bromus catharticus*	Prairie Grass		C
*	*Chloris gayana*	Rhodes Grass		C
CPW	*Chloris truncata*	Windmill Grass		R
CPW	*Chloris ventricosa*	Plump Windmill Grass		M
**	*Cortaderia selloana*	Pampas Grass	AW	U
CPW	*Cymbopogon refractus*	Barbed Wire Grass	MC	R
+	*Cynodon dactylon*	Common Couch		C
CPW	*Echinopogon caespitosus* var. *caespitosus*	Tufted Hedgehog Grass		U
CPW	*Echinopogon ovatus*	Forest Hedgehog Grass		U
*	*Ehrharta erecta*	Panic Veldt Grass		M
**	*Eragrostis curvula*	African Love Grass		M
	Entolasia stricta	Wiry Panic		R
CPW	*Eragrostis leptostachys*	Paddock Love Grass		U
	Lachnagrostis aemula	Blowngrass		R
*	*Lolium perenne*	Perennial Rye Grass		C
CPW	*Microlaenea stipoides*	Weeping Grass		M
CPW	*Panicum effusum*	Hairy Panic		U
CPW	*Paspalidium distans*	-		R
*	*Paspalum dilatatum*	Paspalum		U
*	*Pennisetum clandestinum*	Kikuyu		C
*	*Poa annua*	Winter Grass		U
CPW	*Rytidosperma racemosum* var. *racemosum*	-		U
CPW	*Rytidosperma tenuius*	-		U
*	*Setaria parviflora*	-		M
CPW	*Themeda australis*	Kangaroo Grass	MC	U
*	*Vulpia muralis*	-		M
	Pteridaceae			
CPW	*Cheilanthes sieberi* subsp. *sieberi*	Poison Rock Fern	MC	R
	Ranunculaceae			
CPW	*Clematis glycinoides var. glycinoides*	Headache Vine		M
	Rubiaceae			
*	*Galium murale*	Small Bedstraw		U
CPW	*Opercularia diphylla*	-		U

Appendix C Flora surveyed from the site on the 23rd and 24th of September 2013.

Status	Species name	Common name	Location	Frequency
	Santalaceae			
CPW	*Exocarpos cupressiformis*	Cherry Ballart	MC	R
	Scrophulariaceae			
CPW	*Eremophila debilis*	Winter Apple		M
	Solanaceae			
**	*Lycium ferocissimum*	African Boxthorn		M
*	*Solanum chenopodioides*	Whitetip Nightshade		M
*	*Solanum nigrum*	Black-berry Nightshade		M
CPW	*Solanum prinophyllum*	Forest Nightshade		U
*	*Solanum pseudocapsicum*	Madeira Winter		U
	Typhaceae			
	Typha sp.	Cumbungi	AW	C
	Verbenaceae			
**	*Lantana camara*	Lantana	GR	M
*	*Verbena bonariensis*	Purpletop		U
	Total native	71		
	Total exotic	61		
	Total CPW	49		

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Glenfield Waste Services Site
Cambridge Avenue, Glenfield

Proposed Rezoning & Expansion

Cumberland Plain Woodland Assessment Report

Appendix D
Flora Quadrat Data

March 2014

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

KEY	
Symbol	**Description**
Status	
*	Exotic species
**	Noxious species declared in the Campbelltown LGA
+	Native but not endemic
CPW	Species is listed as "*characteristic*" within the Final Determination (Scientific Committee 2013) for the Cumberland Plain Woodland (CPW), which is listed as a "*critically endangered ecological community*" on the TSC Act and *Environmental Protection & Biodiversity Conservation Act* 1999 (EPBC Act)
Record	
Q1	Quadrat 1 sampled from the 'Low' condition Grey Box – Red Gum Woodland (Figure 3)
Q2	Quadrat 2 sampled from the 'Very Low' condition Grey Box – Red Gum Woodland (Figure 3)
Q3	Quadrat 3 sampled from the 'Low' condition Grey Box – Red Gum Woodland (Figure 3)
Q4	Quadrat 4 sampled from the 'Moderate' condition Red Gum – Ironbark Woodland (Figure 3)
Q5	Quadrat 5 sampled from the 'Very Low' condition Red Gum – Ironbark Woodland (Figure 3)
Q6	Quadrat 6 sampled from the 'Low' condition Grey Box – Red Gum Woodland (Figure 3)
Q7	Quadrat 7 sampled from the 'Very low' condition Grey Box – Red Gum Woodland (Figure 3)
	* Quadrat of Braun-Blanquet Cover Abundance from the subject site; • 1 (<5% uncommon); • 2 (<5% common); • 3 (5-25% common); • 4 (25-50%); • 5 (50-75%); • 6 (75-100%)

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Quadrat 1 For location, see Figure 3

Status	Species name	Common name	Q
*	*Araujia sericifera*	Moth Vine	1
CPW	*Arthropodium milleflorum*	Pale Vanilla-lily	2
*	*Bromus catharticus*	Prairie Grass	2
CPW	*Brunoniella australis*	Blue Trumpet	2
CPW	*Bursaria spinosa*	Blackthorn	1
CPW	*Chloris ventricosa*	Plump Windmill Grass	1
CPW	*Clematis glycinoides var. glycinoides*	Headache Vine	1
CPW	*Dichondra repens*	Kidney Weed	2
*	*Ehrharta erecta*	Panic Veldt Grass	2
CPW	*Einadia hastata*	Berry Saltbush	2
CPW	*Eremophila debilis*	Winter Apple	2
CPW	*Eucalyptus moluccana*	Grey Box	3
*	*Lolium perenne*	Perennial Rye Grass	4
CPW	*Microlaenea stipoides*	Weeping Grass	4
**	*Olea europaea* subsp. *cuspidata*	African Olive	2
*	*Petrorhagia velutina*	-	3
*	*Plantago lanceolata*	Lamb's Tongue	3
*	*Senecio madagascariensis*	Fireweed	2
*	*Sida rhombifolia*	Paddy's Lucerne	2
*	*Solanum chenopodioides*	Whitetip Nightshade	1
*	*Sonchus oleraceus*	Common Sowthistle	1
CPW	*Vernonia cinerea*	-	1
	Total native species	11	
	Total exotic species	11	
	Total CPW species	11	

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Quadrat 2 For location, see Figure 3

Status	Species name	Common name	Q
*	*Anagallis arvensis*	Scarlet Pimpernel	1
*	*Araujia sericifera*	Moth Vine	1
CPW	*Arthropodium milleflorum*	Pale Vanilla-lily	1
*	*Bidens pilosa*	Cobblers Pegs	2
*	*Bromus catharticus*	Prairie Grass	5
CPW	*Brunoniella australis*	Blue Trumpet	1
CPW	*Commelina cyanea*	Native Wandering Jew	1
+	*Cynodon dactylon*	Common Couch	2
CPW	*Dichondra repens*	Kidney Weed	2
*	*Ehrharta erecta*	Panic Veldt Grass	2
CPW	*Einadia nutans* subsp. *linifolia*	-	1
CPW	*Eucalyptus moluccana*	Grey Box	4
*	*Lolium perenne*	Perennial Rye Grass	3
CPW	*Microlaenea stipoides*	Weeping Grass	3
*	*Modiola caroliniana*	Red-flowered Mallow	2
**	*Olea europaea* subsp. *cuspidata*	African Olive	1
*	*Paspalum dilatatum*	Paspalum	1
*	*Plantago lanceolata*	Lamb's Tongue	3
*	*Solanum chenopodioides*	Whitetip Nightshade	1
	Total native species	8	
	Total exotic species	11	
	Total CPW species	7	

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Quadrat 3 For location, see Figure X

Status	Species name	Common name	Q
*	*Araujia sericifera*	Moth Vine	1
CPW	*Aristida vagans*	Three-awn Spear Grass	2
CPW	*Arthropodium milleflorum*	Pale Vanilla-lily	2
*	*Asparagus aethiopicus*	Asparagus 'Fern'	1
**	*Asparagus asparagoides*	Bridal Creeper	2
CPW	*Brunoniella australis*	Blue Trumpet	3
CPW	*Bursaria spinosa*	Blackthorn	2
CPW	*Chloris ventricosa*	Plump Windmill Grass	3
CPW	*Dichondra repens*	Kidney Weed	2
CPW	*Einadia hastata*	Berry Saltbush	2
CPW	*Einadia nutans* subsp. *linifolia*	-	2
CPW	*Einadia trigonos*	Fishweed	2
CPW	*Eremophila debilis*	Winter Apple	3
CPW	*Eucalyptus moluccana*	Grey Box	3
CPW	*Indigofera australis*	Australian Indigo	1
	Melaleuca decora	-	2
CPW	*Microlaenea stipoides*	Weeping Grass	2
**	*Olea europaea* subsp. *cuspidata*	African Olive	1
CPW	*Panicum effusum*	Hairy Panic	2
CPW	*Paspalidium distans*	-	1
CPW	*Rytidosperma racemosum* var. *racemosum*	-	3
*	*Senecio madagascariensis*	Fireweed	1
*	*Vinca major*	Greater Periwinkle	1
	Total native species	17	
	Total exotic species	6	
	Total CPW species	16	

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Quadrat 4 For location, see Figure 3

Status	Species name	Common name	Q
	Acacia decurrens	Black Wattle	2
*	*Araujia sericifera*	Moth Vine	1
CPW	*Aristida ramosa*	Purple Wire Grass	1
**	*Asparagus asparagoides*	Bridal Creeper	2
*	*Avena barbata*	Bearded Oats	1
*	*Bidens pilosa*	Cobblers Peg	2
CPW	*Bossiaea prostrata*	-	1
CPW	*Brunoniella australis*	Blue Trumpet	2
CPW	*Bursaria spinosa*	Blackthorn	3
*	*Chloris gayana*	Rhodes Grass	1
CPW	*Chloris ventricosa*	Plump Windmill Grass	1
CPW	*Chorizema parviflorum*	Eastern Flame Pea	1
*	*Conyza bonariensis*	Flaxleaf Fleabane	1
CPW	*Daviesia ulicifolia*	Gorse Bitter Pea	2
CPW	*Dichondra repens*	Kidney Weed	2
CPW	*Einadia hastata*	Berry Saltbush	1
**	*Eragrostis curvula*	African Love Grass	5
CPW	*Eragrostis leptostachys*	Paddock Love Grass	1
CPW	*Eucalyptus crebra*	Narrow-leaved Ironbark	1
CPW	*Eucalyptus moluccana*	Grey Box	1
CPW	*Eucalyptus tereticornis*	Forest Red Gum	3
CPW	*Euchiton sphaericus*	-	1
CPW	*Glycine clandestina*	-	2
**	*Hypericum perforatum*	St. Johns Wort	1
*	*Hypochaeris radicata*	Cats-ear	2
*	*Linum trigynum*	French Flax	1
*	*Lolium perenne*	Perennial Rye Grass	1
CPW	*Lomandra multiflora*	Many-flowered Mat-rush-	1
*	*Paspalum dilatatum*	Paspalum	1
*	*Plantago lanceolata*	Lamb's Tongue	2
*	*Senecio madagascariensis*	Fireweed	2
*	*Setaria parviflora*	-	1
*	*Sida rhombifolia*	Paddy's Lucerne	2
CPW	*Themeda australis*	Kangaroo Grass	3
CPW	*Wahlenbergia stricta* subsp. *stricta*	Tall Bluebell	2
	Total native species	19	
	Total exotic species	16	
	Total CPW species	18	

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Quadrat 5 For location, see Figure 3

Status	Species name	Common name	Q
*	*Bidens pilosa*	Cobblers Peg	2
+	*Cynodon dactylon*	Common Couch	6
CPW	*Dichondra repens*	Kidney Weed	2
CPW	*Eucalyptus moluccana*	Grey Box	3
CPW	*Eucalyptus tereticornis*	Forest Red Gum	2
*	*Lolium perenne*	Perennial Rye Grass	2
*	*Modiola caroliniana*	Red-flowered Mallow	2
*	*Plantago lanceolata*	Lamb's Tongue	2
*	*Senecio madagascariensis*	Fireweed	2
*	*Sida rhombifolia*	Paddy's Lucerne	2
	Total native species	4	
	Total exotic species	6	
	Total CPW species	3	

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Quadrat 6 For location, see Figure 3

Status	Species name	Common name	Q
CPW	*Arthropodium minus*	-	1
*	*Bidens pilosa*	Cobblers Peg	2
*	*Bromus catharticus*	Prairie Grass	3
+	*Cynodon dactylon*	Common Couch	5
CPW	*Dichondra repens*	Kidney Weed	2
*	*Ehrharta erecta*	Panic Veldt Grass	1
CPW	*Einadia trigonos*	Fishweed	2
**	*Eragrostis curvula*	African Love Grass	2
CPW	*Eucalyptus moluccana*	Grey Box	2
CPW	*Glycine clandestina*	-	1
*	*Lolium perenne*	Perennial Rye Grass	3
**	*Lycium ferocissimum*	African Boxthorn	1
*	*Modiola caroliniana*	Red-flowered Mallow	1
*	*Plantago lanceolata*	Lamb's Tongue	2
CPW	*Rytidosperma racemosum* var. *racemosum*	-	2
*	*Senecio madagascariensis*	Fireweed	2
*	*Sida rhombifolia*	Paddy's Lucerne	2
*	*Solanum chenopodioides*	Whitetip Nightshade	1
CPW	*Vernonia cinerea*	-	1
	Total native species	8	
	Total exotic species	11	
	Total CPW species	7	

Appendix D Quadrats surveyed from the site on the 30th of September and 1st of October 2013.

Quadrat 7 For location, see Figure 3

Status	Species name	Common name	Q
*	*Araujia sericifera*	Moth Vine	2
**	*Asparagus asparagoides*	Bridal Creeper	2
	Austrostipa ramosissima	Stout Bamboo Grass	6
CPW	*Brunoniella australis*	Blue Trumpet	2
CPW	*Bursaria spinosa*	Blackthorn	2
CPW	*Dichondra repens*	Kidney Weed	2
*	*Ehrharta erecta*	Panic Veldt Grass	3
CPW	*Einadia trigonos*	Fishweed	3
CPW	*Eucalyptus moluccana*	Grey Box	4
**	*Lycium ferocissimum*	African Boxthorn	1
*	*Modiola caroliniana*	Red-flowered Mallow	1
**	*Olea europaea* subsp. *cuspidata*	African Olive	1
*	*Plantago lanceolata*	Lamb's Tongue	2
CPW	*Plectranthus parviflorus*	Cockspur Flower	1
*	*Senecio madagascariensis*	Fireweed	2
*	*Sida rhombifolia*	Paddy's Lucerne	2
*	*Solanum chenopodioides*	Whitetip Nightshade	1
CPW	*Solanum prinophyllum*	Forest Nightshade	1
	Total native species	8	
	Total exotic species	10	
	Total CPW species	7	

Appendix 16

SLR November 2014: Biobanking Credit Assessment, EPBC Act Cumberland Plain Shale Woodlands Assessment

global environmental solutions

BioBanking Credit Assessment (Field Work Report)

EPBC Act Cumberland Plain Shale Woodlands Assessment

Proposed Recycling Facility

Report Number 630.11018-R2

25 November 2014

Glenfield Waste Services

Version: Draft 2

BioBanking Credit Assessment (Field Work Report)

EPBC Act Cumberland Plain Shale Woodlands Assessment

Proposed Recycling Facility

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This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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1 INTRODUCTION

1.1 Background

SLR Consulting Australia (SLR) has been engaged by Glenfield Waste Services to prepare the following:

- Biobanking credit assessments of the proposed development and a series of proposed offset areas within the subject site.

- Assessment of woodland vegetation to determine whether the threatened ecological community Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest is present on the subject site (specifically the development footprint). This community is listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The purpose of Item 1 is to obtain preliminary advice on the likely BioBanking credit requirement to offset the proposed development impacts, as well as likely BioBanking credits that could be generated by proposed 'offset' (or biobank) areas dedicated under a Biobanking Agreement pursuant to the NSW *Threatened Species Conservation Act 1995* (or equivalent mechanism).

Item 2 will assist in the decision on whether to refer the project to the Commonwealth Department of the Environment for consideration under the EPBC Act.

The current version of this report represents an update of the desktop assessment prepared in October 2014. It presents updated results which are derived from field survey data collected during a two day survey conducted by SLR ecologists on 3 and 4 November 2014. The aims of the survey were two-fold:

- To collect sufficient data, in accordance with the Biobanking Assessment Methodology (BBAM), to improve the accuracy of credit calculations in the Biobanking Credit Calculator, for both the credit requirements for removal of native vegetation associated with the proposal and for credits generated by the creation of a biobank across the site; and

- To collect sufficient data to determine the extent of Cumberland Plain Shale Woodlands, as defined under the EPBC Act, across the subject site.

Further details on study methods for each of the above elements are provided in Section 2.1 and 3.1, respectively.

1.2 The Site

The Glenfield Waste Services site (the 'subject site') is a triangular portion of land occupied by Glenfield Waste Services and is approximately 100 hectares (ha) in area and comprises 9 lots:

- Lot 3 in DP 735524 – in the southwestern corner;

- Lot 3 in DP 736881 - along the southern boundary;

- Lot 2 in DP 333578 – in the southeastern corner;

- Lots 5 and 9 in DP 833516 – either side of the railway through the centre;

- Lot 51 in DP 515696 – along the eastern boundary in the north of the site;

- Lot 52 in DP 517310 – in the central north of the site; and
- Lots 103 and 104 in DP 1143827 – in the north and northwestern portions of the site.

Lot 3 in DP 736881 (also part of the subject site) is occupied by a transmission line easement which runs along the southern boundary of the existing operations area. The East Hills Railway runs in an east-west direction through the centre of the subject site. The land within the northerly portion of the subject site operates as a landfill and is largely cleared with some riparian vegetation along the Georges River and some grassed areas with a few patches of mostly planted trees.

The land to the south of the East Hills Railway contains a recycling facility within the easterly portion of this area with a relatively large patch of woodland in the westerly portion of this area. This woodland patch, comprising approximately 9.5 ha, is proposed to be cleared under the current development plan. Small patches of woodland have been identified around the periphery of the subject site as potential rehabilitation and/or offset areas.

The subject site is roughly triangular in shape, and is bounded by:

- the Georges River along its eastern boundary;
- the Main Southern Railway along its western boundary; and
- Cambridge Avenue and residential development along its southern boundary.

Reference to the subject site in this report means the entire site (not just the land subject to the proposed development), as shown in Figure 1.

1.3 The Proposed Development

Glenfield Waste Services is proposing to develop a materials recycling facility within the southern portion of the subject site, south of the East Hills Rail Line and north of Cambridge Avenue. The facility will have a capacity to process and/or recycle approximately 450,000 tonnes per annum of non-putrescible waste; primarily commercial and industrial (C&I) and construction and demolition (C&D) wastes for re-use in secondary markets. The proposal will be located across approximately 5 ha, in four differentiated but contiguous areas, and positioned to avoid existing landfill cells. Site entry and egress for transport of wastes and processed materials will utilise existing site access locations along Cambridge Avenue and Railway Parade, respectively.

The proposal is deemed to be 'State Significant Development' (SSD) pursuant to Part 4.1 of the NSW *Environmental Planning and Assessment Act 1979*.

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2 BIOBANKING ASSESSMENT

2.1 Methods

2.1.1 Overview

A biobanking assessment of the proposal was carried out according to the *BioBanking Assessment Methodology 2014* (BBAM 2014), with reference to the following key documents:

- *BioBanking Assessment Methodology 2014* (OEH 2014a);
- *Framework for Biodiversity Assessment* (OEH 2014b);
- *BioBanking Assessment Methodology and Credit Calculator Operational Manual* (DECC 2009a); and
- *Assessors guide to using the BioBanking Credit Calculator v.2* (OEH 2012).

The BioBanking methodology must be applied separately for proposed development sites and for proposed offset (or 'biobank') sites. The methodology can be divided into three distinct phases:

1. Preliminary Assessment;
2. Field Data Collection; and
3. Generating Credit Profile.

The current investigation involved items 2 and 3, including field data collection and the subsequent generation of a credit profile for both the development impacts and the proposed offset areas. The required vegetation plot/transect data was collected in accordance the BBAM as described in Section 2.1.2).

Information regarding the vegetation types and their condition within the subject site was previously obtained (for the desktop assessment) from two key documents:

- SLR (2014) Cumberland Plain Woodland Assessment Report; and
- Keystone Ecological - Flora Assessment, Glenfield Waste Services, Cambridge Avenue, Glenfield (Ashby 2012).

Both studies involved vegetation surveys and collection of floristic data from quadrats. However, the data was not collected in accordance with the BBAM and so could not be entered as plot data into the Credit Calculator. Hence, field data was required to properly assess site value for the purposes of credit calculations in the current assessment. None-the-less, the distribution, extent, and condition of identified vegetation within the subject site as represented in these reports were used in the current assessment. Both field surveys covered the southern part of the subject site, extending south from the East Hills Rail Line to Cambridge Avenue and east to the site entrance off Cambridge Avenue and west to the Main Southern Railway. Information on vegetation north of the East Hills Rail Line was obtained from mapping of the Cumberland Plain by NPWS (2002), aerial photo interpretation and the collection of plots data at discrete locations, as described in Section 2.1.2.

2.1.2 Site Value Score - BBAM Field Surveys

Field surveys according to the BBAM were conducted on the subject site on 3 and 4 November 2014.

In the Biobanking Credit Calculator, site value score is derived through data collected from a series of transects and plots. The site attributes are assessed to calculate the number of ecosystem credits that are able to be created at a biobank site. Transects and plots are established in each vegetation zone to collect the site attribute data used to measure site value according to the techniques set out in Appendix 2 of DECC (2009a).

Initially, the subject site was stratified into vegetation zones as part of the desktop assessment. Vegetation zones are relatively homogenous areas of the same vegetation type and similar condition. Each vegetation zone is a distinct vegetation type (according to the *NSW Vegetation Types Database*) and similar broad condition state (being either 'moderate to good' or 'low'). Vegetation in low condition always forms a separate zone from vegetation that is in moderate to good condition.

The minimum number of plots per vegetation zone was calculated using Table 3 in OEH (2014a). The number of plots required (and established during field work) in each vegetation zone within the development area is listed in Table 1 and within the proposed offset areas in Table 2.

Table 1 Development area - plot/transects per vegetation zone

Veg Zone	NSW Vegetation Type	Condition	Area (ha)	No. Plots
1	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin	Low	2.58	1
2	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin	Moderate to Good	6.91	3

Table 2 Biobank (offset) areas – plot/transects per vegetation zone

Veg Zone	NSW Vegetation Type	Condition	Area (ha)	No. Plots
1	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin	Moderate to Good	1.15	1
2	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin	Low	13.81	2
3	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin	Low	7.70	2

At each plot a 20 m X 20 m quadrat was established. A species list with cover/abundance score according to the Braun-Blanquet system (see Poore 1955) for each species was compiled. Additionally, a 50 m transect is used to score a selection of seven variables relating to vegetation cover and structure. A further three variables are gathered including:

- total length of fallen logs in a 50 m x 20 m plot;
- number of trees with hollows in a 50 m x 20 m plot; and
- proportion of regeneration in the canopy across the vegetation zone.

Field data was entered in to standard biobanking field sheet templates (DECC 2009b), including:

- Transect plot worksheet; and
- Quadrat species list.

Transect and plot data was then tallied into the following DECC (2009b) templates:

- Transect tally table; and

- Transect plot data sheet.

Data compiled into the transect plot datasheet was then imported into the Credit Calculator.

2.1.3 Credit Calculations

Credit calculations for the desktop assessment were completed using version 2.1 of the Credit Calculator. However, the updated Credit Calculator for Major Projects & Biobanking was released online on 30 October 2014, which contains amendments to reflect the *Biobanking Assessment Methodology 2014* (OEH 2014a) and *Framework for Biodiversity Assessment* (FBA, OEH 2014b).

A new run of the Credit Calculator was conducted on 24 November 2014, which incorporated both the site value data collected during the current field survey and the new elements of BBAM 2014 built into the Calculator. The new elements can be summarised as follows:

- Landscape score – the same landscape assessment circles and associated results (used in the desktop assessment) were utilised; however, BBAM 2014 requires an assessment of whether the development site (or biobank site) affects the riparian values of higher order streams, wetlands, estuaries or significant biodiversity corridors. For the purposes of the current assessment, it was assumed (in the absence of available GIS data) that the Georges River is at least a regional biodiversity corridor and/or a 5th order stream (under the Strahler system);

- Site value score – the BBAM 2014 no longer requires threatened species subzones to be included. Site survey data for each vegetation zone, as described in Section 2.1.2, was imported into the Calculator. No changes to vegetation zone boundaries or condition classes were required following the field survey. Management scores for were set to default values.

- Threatened species – some of the threatened species predicted to occur for ecosystem credits and some requiring surveys for species credits have changed with the advent of BBAM 2014. No threatened species have been recorded on site to date and targeted threatened species surveys were not part of the current assessment. Consequently, assessment of species credit requirements did not form part of the credit calculations.

All credit calculations in this report were completed by Jeremy Pepper, Principal Ecologist and Biobanking accredited assessor No.0107.

Development Credits

Assumptions that were used in running the Credit Calculator for the proposed development impacts are listed in Appendix A and those for the biobank are listed in Appendix B.

The key elements of the credit calculation for the proposed development impacts are:

- The area of impact is a 9.5 ha area centred on the proposed recycling facility and is based on a polygon supplied by EPS (see Figure 2); and

- All vegetation within the development footprint would be permanently removed.

In terms of the landscape value score, percentage woody cover of native vegetation within the 100 ha and 1000 ha circles was estimated in GIS using NPWS (2002) vegetation mapping. The landscape circles are shown in Figure 3.

Vegetation zones were determined by combining vegetation patches into combined patches in either 'low' or 'moderate to good' condition according to the BBAM, and translating vegetation types into one or more of the *NSW Vegetation Types*. The vegetation types and condition as mapped by SLR (2014) are displayed in Figure 4 and the resulting vegetation zones are mapped in Figure 5.

Biobank Credits

Assumptions that were used in running the Credit Calculator for the biobank areas are listed in Appendix B. The key elements of the credit calculation are:

- The proposed biobank areas are as supplied by EPS and digitised by SLR (see Figure 2); and
- The areas are largely cleared of vegetation and so it is assumed that they would be revegetated and would become fully vegetated with woody native vegetation over the life of the biobank.

In terms of the landscape value score, percentage woody cover of native vegetation within the 100 ha and 1000 ha circles was estimated in GIS using NPWS (2002) vegetation mapping. The landscape assessment circles for the biobank assessment are shown in Figure 6.

Vegetation zones were determined by combining vegetation patches into combined patches in either 'low' or 'moderate to good' condition according to the BBAM, and translating vegetation types into one or more of the NSW Vegetation Types. The biobank vegetation zones are mapped in Figure 7.

2.2 Results

2.2.1 Credits required for clearing (development impacts)

The credit results for the development impacts are provided in Appendix C. The results of the current investigation indicate:

- 296 ecosystem credits of the type known as Grey Box - Forest Red Gum grassy woodland, a form of the Cumberland Plain Woodland endangered ecological community (EEC) would be required to offset the proposed development impacts;
- 224 ha of the Grey Box - Forest Red Gum grassy woodland vegetation type is listed as a 'red flag' (being an EEC). It should be noted that Director-General approval to vary the red flag rules for development proposals is not applicable to major projects (SSD);
- No 'species credits' are listed as being required in the BioBanking Credit Calculator BBCC. However, as noted in the assumptions table (refer to Appendix A), targeted surveys for a few such species during the spring survey period might be warranted to demonstrate to the NSW Government (including the Office of Environment and Heritage) that no species credits will be required to offset the development. Examples include the Green & Golden Bell Frog, Little Eagle, *Pimelea spicata*, *Pterostylis saxicola* (orchid) and *Caladenia tessellata* (orchid). The survey periods for these species all overlap in September and October.

2.2.2 Credits generated by offset areas

The credit report for the biobank areas is provided in Appendix D. The results indicate that creation of a biobank encompassing the areas shown in Figure 2 would generate a total of 238 ecosystem credits, comprising:

- 85 ecosystem credits of the type known as Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin, a form of the River-flat Forest on coastal floodplains EEC;

- 153 ecosystem credits for Grey Box - Forest Red Gum grassy woodland, a form of Cumberland Plain Woodland EEC); and

- No 'species credits' are listed in the Credit Calculator. However, as noted above, targeted surveys for a selection of species credit species during the spring survey period might be prudent, in this case to try to increase the value of the biobank by generating species credits.

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3 EPBC ACT CPW ASSESSMENT

3.1 Methods

This section has been updated following the completion of field surveys in early November 2014, which involved the collection of quadrat data within each nominated patch of potential or actual EPBC Act Cumberland Plain Shale Woodland.

3.1.1 Desktop Patch Assessment

All patches of woodland vegetation within the subject site were assessed for whether they conform to the definition of *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* ('Cumberland Plain Shale Woodlands'), which is listed as a 'critically endangered' ecological community under the EPBC Act. The Commonwealth guidelines for this listed community, entitled *Policy Statement 3.31* (DEWHA 2009), were utilised to determine the presence of this community on the subject site.

The following method was applied to the EPBC Act CPW assessment:

- Compiling previous mapping of the site by SLR (2014) and Ashby (2012) and mapping all areas of woodland vegetation on the subject site that were either previously mapped as Cumberland Plain Woodland, or were likely to constitute Cumberland Plain Shale Woodlands. Regional mapping of the Cumberland Plain by NPWS (2002) was used to map areas within the subject site not covered by SLR or Ashby. Areas of the subject site lying north of the East Hills Rail Line and south of Cambridge Avenue were not surveyed and mapped previously by SLR or by Ashby. NPWS (2002) mapping was used to assess these areas at a desktop level. (Field verification of these areas would be required to confirm the results outlined in this Section).

- Mapping 'patches' of woodland vegetation, according to the definition of a 'patch' on p10 of DEWHA (2009);

- Running through the diagnostic criteria on p11 of DEWHA (2009). A copy of the flow chart of 'key diagnostic features' is provided in Appendix E. This included assessing for each patch:
    - area (in hectares) of each patch using GIS software;
    - presence of 'typical dominant tree species' of the canopy layer, by referring to quadrat data in Appendix D of SLR (2014) and in Table 2 of Ashby (2012);
    - average foliage projective cover (FPC) of the canopy; and
    - percentage of native understorey vegetation cover[1] (with 50% native cover being the threshold criterion).

Where patches that contain typical dominant trees species with greater than 10% FPC in the canopy layer, are greater than 0.5 ha in area, but have less than 50% native perennial understorey, the following additional criteria were assessed:

- Patch size (whether 5 ha or greater);

- Whether the patch is linked to an adjoining patch of 5 ha or greater;

- Where the patch is not linked to an adjoining patch of >5 ha; whether the patch contains at least one tree per hectare that is large (>=80 cm dbh) or has a hollow; and

- Whether 30% of the perennial understorey cover is native.

1 Perennial plant species of shrub and ground layers with life cycles > 2 growing seasons.

3.1.2 Field Assessment

Quadrat surveys were conducted on 3 and 4 November 2014 within each patch of woodland identified during the desktop assessment, as mapped in Figure 8. The following data were collected from each quadrat:

- presence of 'typical dominant tree species' of the canopy layer;
- average foliage projective cover (FPC) of the canopy; and
- percentage of native perennial understorey vegetation cover.

The locations of quadrats are shown in Figure 8. A total of six quadrats were established as part of BBAM surveys, but also specifically located to ensure that sufficient data was collected to sample the variation in condition of Cumberland Plain Shale Woodlands within each patch. The quadrats established for each patch are listed in Table 3.

Table 3 Quadrats established in CPW patches

CPW Patch	Size (ha)	BBAM Quadrat
1	12	DZ1A, DZ2A, DZ2B, DZ2C
2	0.63	BZ1A
3	1.15	BZ2C
4	1.653	not surveyed - not a distinct patch of CPW

Critical to any assessment of EPBC Act criteria for Cumberland Plain Shale Woodlands is the composition of the understorey. In this case, neither SLR nor Ashby had collected data that addressed this criterion totally; therefore, a key objective of the current field survey was to obtain quadrat results for the percentage native perennial understorey component. Field verification was necessary to determine more accurately the scores for this criterion in each patch of woodland on the subject site.

No areas of 'derived native grassland' have been mapped on the subject site and hence no such vegetation was included in the assessment.

3.2 Results

The updated results for the Cumberland Plain Shale Woodlands assessment are compiled in an MS Excel spreadsheet, which is attached in Appendix F. The Cumberland Plain Shale Woodlands patches are mapped in Figure 8.

The results of the field investigations are largely consistent with those of the desktop study, revealing that the subject site contains areas of vegetation that meet the definition of Cumberland Plain Shale Woodlands, as set out in the DEWHA (2009) guidelines. Stands of Cumberland Plain Shale Woodlands are restricted to areas lying south of the East Hills Rail Line, and exclude areas of planted vegetation, exotic grasslands and the riparian vegetation that lines the Georges River on the eastern site boundary (which comprises 'Alluvial Woodland', which is a subunit of the River-flat Forest EEC[2]).

The updated results are presented in Appendix F and summarised in Table 4. A total of 13.77 ha of Cumberland Plain Shale Woodlands has been surveyed and mapped across the site, as listed in Table 4 and shown in Figure 8.

2 *River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* (NSW Scientific Committee 2011).

The majority of the vegetation that has been assessed as complying with the DEWHA (2009) definition of Cumberland Plain Shale Woodlands lies within CPW Patch 1, with 12 ha of this vegetation mapped within the central and western parts of the subject site (Figure 8). Of this, 9.5 ha lies within the development footprint for the proposed recycling facility and would be completely removed. This vegetation contains a mosaic of condition classes, ranging from cleared land, through low condition to moderate condition. However, the definition of a 'patch' in the DEWHA (2009) guideline means that all areas of low condition vegetation are still considered as part of the same patch of Cumberland Plain Shale Woodlands.

Table 4 Patch analysis – EPBC Act Cumberland Plain Shale Woodlands

CPW Patch*	Size (ha)	SLR Veg Types	NPWS (2002)	EPBC Act CPW?
1	11.99	Grey Box _ Red Gum Woodland _ Very Low; Grey Box _ Red Gum Woodland _ Low; Red Gum - Ironbark Woodland_low; Red Gum - Ironbark Woodland_very low	Shale Plains Woodland	Yes
2	0.63	Red Gum - Ironbark Woodland_Moderate	Shale Plains Woodland	Yes
3	1.15	Grey Box _ Red Gum Woodland _ Low	Shale Plains Woodland	Yes
4	(<0.5)	(not surveyed – re-evaluated as not forming a patch of CPW)	Shale Plains Woodland	No
Total CPW	**14.27**			

Two additional patches mapped by NPWS (2002) as Shale Plains Woodland (>10% cover class) lie in the southeastern parts of the subject site. These areas were not surveyed by SLR (2014) or Ashby (2012), but were surveyed during the recent site survey. These two areas were previously mapped as patches 3 and 4 (Table 4 and Figure 8) and contain 'typical dominant' CPW canopy trees with an FPC of >10%. Patch 3 has been re-mapped as part of the current investigation and extends to the eastern site boundary. Its new area has been calculated in GIS as 1.15 ha. This means Patch 3 is now above the minimum size threshold of 0.5 ha and so meets the definition of the EPBC Act listed community. Field surveys revealed that Patch 4 is not a distinct patch of CPW vegetation and so does not meet the definition of Cumberland Plain Shale Woodlands.

Only very small patches of EPBC Act Cumberland Plain Shale Woodlands lie within the proposed offset areas, as follows:

- Patch 2, a 0.63 ha patch of Shale Plains Woodland (named 'Red Gum – Ironbark Woodland' in SLR 2014) in moderate condition in the western part of the subject site, between an internal road and the East Hills Rail Line and north of the homestead; and

- Patch 3, small patch of woodland with an area of 1.15 ha mapped as 'Shale Plains Woodland' (by NPWS 2002), in the far southeast of the subject site, would also fall within one of the offset areas. This patch is a narrow belt of woodland that follows a small drainage line that flows east into the Georges River.

Both of the above patches are degraded by weed invasion, human access, edge effects and feral animals. Importantly, Patch 2 is in moderate to good condition, with a high diversity of groundcover species (the highest out of all patches surveyed) but is subject to invasion by the exotic perennial grass African Lovegrass *Eragrostis curvula*. Consequently, these (and other) patches proposed for conservation in offset areas would benefit from weed control, exclusion of grazing and/or slashing, access control and possibly controlled (low intensity 'ecological') burns.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Biobanking Credits

The current desktop assessment indicates the following:

- 296 ecosystem credits are required for the proposed development (see Appendix C); and
- 238 ecosystem credits would be generated by the creation of a biobank on the site (see Appendix D).

As shown in Appendix C, the 296 credits for development can be offset (i.e. 'offset options') using the two credit types available in the proposed biobank:

- Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin, (ME018); and
- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin (ME020).

This would still leave a credit deficit of 58 ecosystem credits (Grey Box - Forest Red Gum grassy woodland) that would be required to be purchased or generated on another biobank site elsewhere in the Sydney Metro catchment management area (CMA).

Once it is established that the necessary credits are commercially available and that BioBanking is a viable solution for the subject site, a full BioBanking assessment would need to be conducted. Under the new offsetting policy (see Section 4.2), payments to a NSW Government biobanking fund would be available if the above listed credits are not commercially available and/or the credits generated by the proposed offset areas are not sufficient to offset the project impacts.

4.2 New Biobanking Methodology and Offsetting Policy

The *BioBanking Assessment Methodology 2014* (BBAM 2014) came into effect on 1 October 2014, along with the new *Biodiversity Offsets Policy for Major Projects* (the Offsets Policy) and the related *Framework for Biodiversity Assessment* (FBA). The Offsets Policy applies to state significant development and state significant infrastructure under the *Environmental Planning and Assessment Act 1979*. The credit calculations presented in this report (Appendices C and D) were completed using the new version of Credit Calculator.

We note that, according to the FBA, a *Biodiversity Assessment Report* must be prepared for SSD projects. This report does not constitute and *Biodiversity Assessment Report* (BAR), but would form a supporting document to a BAR.

4.3 EPBC Act CPW

The current assessment indicates that the subject site supports vegetation that meets the criteria for Cumberland Plain Shale Woodlands, which is listed as critically endangered under the EPBC Act. Approximately 14 ha of Cumberland Plain Shale Woodlands has been surveyed and mapped across the site, of which 9.5 ha would be removed for the proposal. Field work conducted as part of the current investigation confirms that Patches 1, 2 and 3 met the definition of Cumberland Plain Shale Woodlands, as they contain the characteristic canopy species with a canopy FPC >10%, are larger than 0.5 ha and have at least 50% native perennial species in the understorey.

We note that previous assessments by Ashby (2012) and SLR (2014) also come to similar conclusions. Ashby states that the subject site "is largely occupied by the Critically Endangered Ecological Community Cumberland Plain Woodland. This is listed under both NSW and Commonwealth legislation". SLR (2014) note that "some of the open forest and woodland vegetation on the subject site would clearly satisfy the criteria identified in the Cumberland Plain Recovery Plan for the Cumberland Plain Woodland (CPW) community – as listed both in the TSC Act and EPBC Act". Furthermore, SLR states that "…areas of vegetation that are in 'Low' or 'Moderate' condition are considered likely to satisfy the criteria for the CPW community as listed in the EPBC Act".

On the basis of the current and previous findings, we recommend that the project be referred to the Commonwealth Department of the Environment for determination pursuant to the EPBC Act. The impacts described herein would likely constitute a 'controlled action' under the EPBC Act, with due consideration to the *Significant Impact Guidelines 1.1* (Dept. of the Environment 2013).

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5 REFERENCES

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SLR (2014*) Glenfield Waste Services Site, Cambridge Avenue, Glenfield. Proposed Rezoning & Expansion. Cumberland Plain Woodland Assessment Report. 21 March 2014*. Unpublished Report, SLR Consulting Australia, Sydney, NSW.

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LEGEND

Subject Site

H:\Projects-SLR\630-SNW\TL\630-NTL\630.11018 Glenfield Waste BioBanking\SLR Data\Drafting\Figures\ArcGIS\SLR630.11018_F01_SubjectSite_01.mxd

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Scale:	1:20,000
Sheet Size:	A4
Projection:	GDA 1994 MGA Zone 56

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Environmental Planning Services

BioBanking Credit Assessment

Subject Site
Proposed Recycling Facility
Glenfield NSW

FIGURE 1

H:\Projects-SLR\630-SYD\TL\630-NTL\630.11018 Glenfield Waste BioBanking\SLR Data\Drafting\Figures\ArcGIS\SLR\630.11018_F02_ProposedDevelopment_01.mxd

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Environmental Planning Services

BioBanking Credit Assessment

Proposed Development Footprint & Potential Onsite Rehab Areas

FIGURE 2

LEGEND

- Subject Site
- Vegetation For Removal
- Woody Cover
- 100Ha Landscape Assessment
- 1000Ha Landscape Assessment

H:\Projects-SLR\630-SNW\TL\630-NTL\630.11018 Glenfield Waste BioBanking\SLR Data\Drafting\Figures\ArcGIS\SLR630.11018_F03_DevelopmentImpacts_01.mxd

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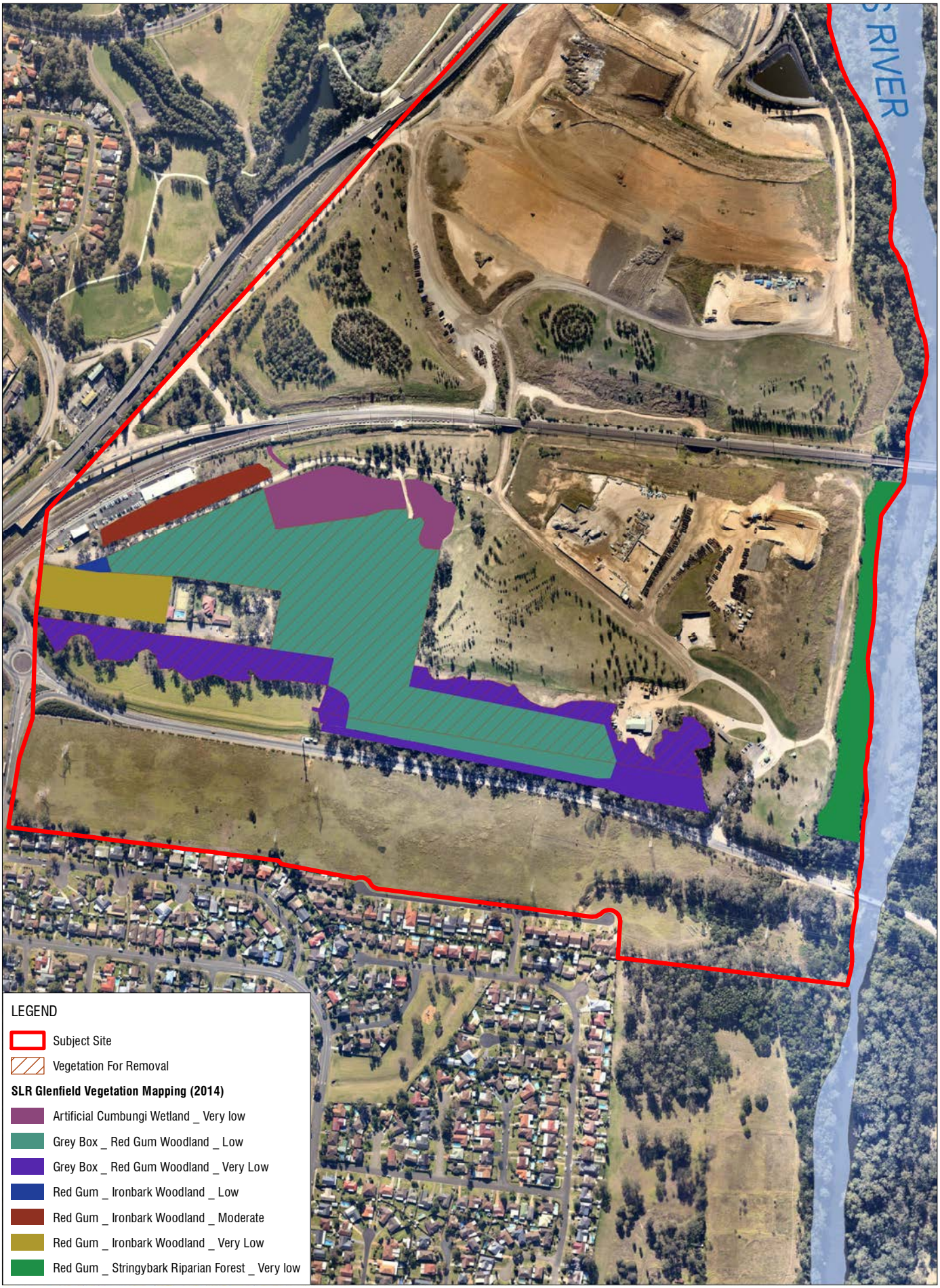
Environmental Planning Services

BioBanking Credit Assessment

Development Impacts
Woody Cover in Landscape Assessment Circles

FIGURE 3



LEGEND

- Subject Site
- Vegetation For Removal

SLR Glenfield Vegetation Mapping (2014)

- Artificial Cumbungi Wetland _ Very low
- Grey Box _ Red Gum Woodland _ Low
- Grey Box _ Red Gum Woodland _ Very Low
- Red Gum _ Ironbark Woodland _ Low
- Red Gum _ Ironbark Woodland _ Moderate
- Red Gum _ Ironbark Woodland _ Very Low
- Red Gum _ Stringybark Riparian Forest _ Very low

H:\Projects-SLR\630-SrvNTL\630-NTL\630.11018 Glenfield Waste BioBanking\SLR Data\Drafting\Figures\ArcGIS\SLR630.11018_F04_VegTypesCondition_02.mxd

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Environmental Planning Services

BioBanking Credit Assessment

SLR (2014) Vegetation Mapping

FIGURE 4

LEGEND

Subject Site

Vegetation Zones Types and Conditions

Zone 1 - Grey Box - Forest Red Gum, Grassy Woodland - Low

Zone 2 - Grey Box - Forest Red Gum, Grassy Woodland - Mod Good

SLR Biobanking Plots

Veg Zone Number	Area (ha)	No. Plots Required
1	2.58	1
2	6.91	3

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Environmental Planning Services

BioBanking Credit Assessment

Proposed Development Footprint Vegetation Zones

FIGURE 5

LEGEND

- Subject Site
- Vegetation Rehabilitation Areas
- Woody Cover
- 100Ha Landscape Assessment
- 1000Ha Landscape Assessment

H:\Projects-SLR\630-SYD\TL\630.NTL\630.11018 Glenfield Waste BioBanking\SLR Data\Drafting\Figures\ArcGIS\SLR\630.11018_F06_OffsetAreasLandscape_01.mxd

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Environmental Planning Services

BioBanking Credit Assessment

Offset Areas
Woody Cover in Landscape Assessment Circles

FIGURE 6

LEGEND

- Subject Site
- Zone 1 - Grey Box - Forest Red Gum, Grassy Woodland - Mod Good
- Zone 2 - Grey Box - Forest Red Gum, Grassy Woodland - Low
- Zone 3 - Forest Red Gum - Rough Barked, Apple Grassy Woodland - Low
- SLR Biobanking Plots

Veg Zone Number	Area (ha)	No. Plots Required
1	1.15	1
2	13.81	2
3	7.70	2

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Environmental Planning Services

BioBanking Credit Assessment

Offset Areas
Vegetation Zones

FIGURE 7

H:\Projects-SLR\630-SnWTL\630.NTL\630.11018 Glenfield Waste BioBanking\SLR Data\Drafting\Figures\ArcGIS\SLR630.11018_F08_Cumberland Plain Woodland EPBC Patches_01.mxd

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Sheet Size:	A4
Projection:	GDA 1994 MGA Zone 56

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Environmental Planning Services

BioBanking Credit Assessment

Cumberland Plain Woodland
EPBC Act
Patches For Assessment

FIGURE 8

BioBanking variable – development credits	Assumption (Credit Calculator input)
Landscape Value	
Map assessment circles	100 ha and 1000 ha assessment circles were placed on the centroid of the proposed development area (see Figure 3).
% native vegetation cover	Calculated for 100 ha and 1000 ha circles in GIS using NPWS (2002) mapping of the vegetation of Cumberland Plain
Adjacent remnant area	Calculated using GIS mapping of vegetation by SLR (2014), and interpretation of this and translation of mapped polygons into either patches of 'moderate to good' or 'low' condition (as per BBAM). Assumed to not extend east to the riparian corridor of the Georges River, as the riparian vegetation on the River is separated from the moderate to good vegetation within the site by a patch of low condition vegetation >100 m in width.
Patch size	Calculated as per adjacent remnant area, but including patches of low condition vegetation (not separated from the vegetation on site by gaps of > 100 m)
Connectivity value Connectivity value class	For the purposes of the connectivity score the following assumptions were adopted: • Georges River is a 5th order stream at this location (ie adjoining the eastern boundary of the site); • The Georges River constitutes a state or regional biodiversity corridor (although no information could be obtained to confirm this at time of writing); • There are no important wetlands or estuaries within or adjacent to the site Vegetation clearing associated with the proposal would not involve clearing the following: • 20m either side of a 4th or 5th order stream (being the Georges River); • 50 either side of a 6th order stream; • Within 50 m of an important wetland or estuary; • State or regional biodiversity corridor
Connectivity width and condition	The primary link is assumed to be theoretically located in an east-west direction across the development area and across to the Georges River, which is located to the east of the development area. However, the development area is not linked to the adjoining riparian vegetation of the Georges River due to a patch of low condition vegetation that is greater than 100 m in width and contains a 'hostile gap' (ie the entrance to the Glenfield Waste facility). The limiting width class of the primary link is taken to be 0-5 m before development and after development. Based on field survey results, the following linkage condition classes were entered for the primary link: • Canopy PFC < 25% of lower benchmark; and • PFC of mid-storey/groundcover 50% Number of linkage width classes crossed = 0
Vegetation zones	Veg zones were created by combining vegetation mapping polygons of SLR (2014), with the following classifications of condition: • All areas of vegetation mapped as 'very low' condition by

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BioBanking variable – development credits	Assumption (Credit Calculator input)
	SLR (2014) are assumed to meet the definition of 'low condition' in BBAM; • All areas mapped by SLR as 'low-moderate' or are assumed to meet the definition of 'moderate to good' in the BBAM. These assumptions were verified by the current field surveys in Nov 2014.
Threatened species sub-zones	(No longer included in BBAM 2014).
Geographical/habitat features	Four features are listed in the Credit Calculator for the subject site: 1. Green and Golden Bell Frog *Litoria aurea* (land within 100 m of emergent aquatic or riparian vegetation); 2. Matted Bush-pea *Pultenaea pedunculata* (land within 5 km of coast in South East Coastal Plains CMA subregion) 3. Cumberland Plain Land Snail (land containing bark or leaf litter accumulation) 4. *Hypsela sessiliflora* (wet and damp areas only) Although some parts of the site are within 100 m of emergent freshwater vegetation within the large dam (or stormwater pond) located in the north of the site, Green & Golden Bell Frogs have not been recorded on the site (and are assumed to be absent from the site). Accordingly, these features are assumed to be not present on the site (and are 'switched off' in the Credit Calculator). Targeted field surveys for listed threatened species during the recommended survey period would be required to determine likely presence or absence from the site.
Site survey details	10 species are listed as potentially occurring species that generate species credits. None of these species have been recorded on the site, although it noted that previous surveys by SLR (2014) and Ashby (2012) were not ideal for the detection of threatened plants. Recommended survey dates for each species are listed (for information only). 17 'predicted species' are listed for ecosystem credits in the Credit Calculator. No such species were assumed to be on site.
Site values Plot data vs benchmark data	For each veg zone, plot/transect data collected on 3 and 4 Nov 2014 was entered to obtain site value score for each veg zone.
Low condition vegetation	All areas of vegetation mapped as 'very low' condition by SLR (2014) are assumed to meet the definition of 'low condition' in BBAM. This assumption was verified by field data collection.
Scoring of site attributes	For each veg zone, plot/transect data collected on 3 and 4 Nov 2014 was entered to obtain site value score for each veg zone.
Management zones	Assumed to match area of each veg zone. Management zone site scores with development all set to default of zero (0) based on assumption that all vegetation within each management zone will be removed by the proposed development.

BioBanking variable – development credits	Assumption (Credit Calculator input)
	Areas of each vegetation zone/management zone to be removed are based on SLR digitisation of a polygon of the development area supplied by EPS (Job ref: 11012, dated 16/07/14).
Threatened species survey results	None of the threatened species listed in the Credit Calculator have been recorded on the site. Hence, all listed species were assumed to not be impacted by the proposed development. ID method (for threatened species) entered is 'survey', based on the findings of SLR (2014) and Ashby (2012), with the date of survey entered as 30 September 2013 (the date of the most recent survey by SLR). It is noted that threatened plants and threatened fauna were not targeted by SLR (2014), as this study was primarily focussed on mapping of vegetation. No threatened species were recorded on the site by Ashby (2012). However, it is noted that the field survey was conducted during winter (30 May and 12 July 2012) when most threatened plants would not be flowering and threatened fauna are less active. Hence, the timing of the Ashby survey was not suitable for the detection of cryptic threatened plants (i.e. only detectable during flowering) or threatened fauna.

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BioBanking variable – biobank/offset areas	Assumption (Credit Calculator input)
Landscape Value	
Map assessment circles	100 ha and 1000 ha assessment circles were placed on the centroid of the proposed offset (biobank) areas (see Figure 6).
% native vegetation cover	Calculated for 100 ha and 1000 ha circles in GIS using NPWS (2002) mapping of the vegetation of Cumberland Plain
Adjacent remnant area	Calculated using mapping of Cumberland Plain vegetation by NPWS (2002), and interpretation of this and translation of mapped polygons into either patches of 'moderate to good' or 'low' condition (as per BBAM). All vegetation mapped in NPWS as >10% cover assumed to represent 'moderate to good' condition woody vegetation at benchmark. For biobank veg zones, assumed to extend north and south along the riparian corridor of the Georges River, but not over the East Hills Rail Line, which is considered a 'hostile gap' in any future biobank corridor.
Patch size	Calculated as per adjacent remnant area, but including patches of 'mod-good' and low condition vegetation (not separated from the vegetation on site by gaps of > 100 m). For veg zone 1 (Figure 7), patch size is limited to the woody vegetation mapped within the subject site, as the vegetation cover is separated from the riparian zone of the Georges River by a gap >100 m. For veg zones 2 and 3 (Figure 7), patch is assumed to extend across the Georges River to the extensive bushland areas to the southeast. Patch size is therefore >500 ha.
Connectivity value Strategic location	For the purposes of the connectivity score the following assumptions were adopted: • The proposed biobank is located within a strategic location, being a riparian buffer area on one side of a 4th or 5th order stream
Vegetation zones	Veg zones were created by combining vegetation mapping polygons of SLR (2014), with the following classifications of condition: • All areas of vegetation mapped as 'very low' condition by SLR (2014) are assumed to meet the definition of 'low condition' in BBAM; • All areas mapped by SLR as 'low-moderate' or are assumed to meet the definition of 'moderate to good' in the BBAM. These assumptions were verified by field data collection as described in this report.
Threatened species sub-zones	(No longer included in BBAM 2014).
Geographical/habitat features	Three features are listed in the Credit Calculator for the subject site: 1. Tadgell's Bluebell *Wahlenbergia multicaulis* endangered population (damp disturbed sites) 2. Green and Golden Bell Frog *Litoria aurea* (land within 100 m of emergent aquatic or riparian vegetation); 3. Matted Bush-pea Pultenaea pedunculata (land within 5 km of coast in South East Coastal Plains CMA subregion) Although some parts of the site are within 100 m of emergent freshwater vegetation within the large dam (or stormwater pond) located in the north of the site, Green & Golden Bell

BioBanking variable – biobank/offset areas	Assumption (Credit Calculator input)
	Frogs have not been recorded on the site (and are assumed to be absent from the site). Accordingly, these features are assumed to be not present on the site (and are 'switched off' in the Credit Calculator). Targeted field surveys for listed threatened species during the recommended survey period would be required to determine likely presence or absence from the site.
Site survey details	8 species are listed as potentially occurring species that generate species credits. None of these species have been recorded on the site, although it noted that previous surveys by SLR (2014) and Ashby (2012) were not ideal for the detection of threatened plants. Recommended survey dates for each species are listed (for information only). 18 'predicted species' are listed for ecosystem credits in the Credit Calculator. No such species were assumed to be on site.
Site values Plot data vs benchmark data	For each veg zone, plot/transect data collected on 3 and 4 Nov 2014 was entered to obtain site value score for each veg zone.
Low condition vegetation	All areas of vegetation mapped as 'very low' condition by SLR (2014) are assumed to meet the definition of 'low condition' in BBAM. This assumption was verified by field data collection.
Scoring of site attributes	For each veg zone, plot/transect data collected on 3 and 4 Nov 2014 was entered to obtain site value score for each veg zone.
Management zones	Assumed to match area of each veg zone and linked to single threatened species sub-zone. Management zone site scores with development all set to default increased score.
Threatened species survey results	None of the threatened species listed in the Credit Calculator have been recorded on the site. ID method (for threatened species) entered is 'survey', based on the findings of SLR (2014) and Ashby (2012), with the date of survey entered as 30 September 2013 (the date of the most recent survey by SLR). It is noted that threatened plants and threatened fauna were not targeted by SLR (2014), as this study was primarily focussed on mapping of vegetation. No threatened species were recorded on the site by Ashby (2012). However, it is noted that the field survey was conducted during winter (30 May and 12 July 2012) when most threatened plants would not be flowering and threatened fauna are less active. Hence, the timing of the Ashby survey was not suitable for the detection of cryptic threatened plants (i.e. only detectable during flowering) or threatened fauna.

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APPENDIX C

Biobanking Credit Results – Development Impacts

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BioBanking credit report

This report identifies the number and type of credits required at a DEVELOPMENT SITE.

Date of report: 25/11/2014 Time: 6:43:40PM Calculator version: v2.1

Development details

Proposal ID:	0107/2014/1362D
Proposal name:	Glenfield Waste BioBanking Statement
Proposal address:	Cambridge Avenue Glenfield NSW 2167
Proponent name:	Glenfield Waste Services
Proponent address:	Cambridge Avenue Glenfield NSW 2167
Proponent phone:	(02) 4981-1600
Assessor name:	Jeremy Pepper
Assessor address:	Level 3 10 Kings Road New Lambton NSW 2305
Assessor phone:	02 4037 3200
Assessor accreditation:	0107

Improving or maintaining biodiversity

An application for a red flag determination is required for the following red flag areas

Red flag	Reason
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Vegetation type being > 70% cleared; or it contains an endangered ecological community;
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Vegetation type being > 70% cleared; or it contains an endangered ecological community;

The application for a red flag determination should address the criteria set out in the BioBanking Assessment Methodology. Please note that a biobanking statement cannot be issued unless the determination is approved.

Additional information required for approval:

☐ Change to percent cleared for a vegetation type/s

- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

☐ Use of local benchmark

- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

☐ Change negligible loss

☐ Expert report...

☐ Request for additional gain in site value

☐ Predicted threatened species not on site

- Black-chinned Honeyeater (eastern subspecies) Melithreptus gularis subsp. gularis

■ Brown Treecreeper (eastern subspecies)	Climacteris picumnus subsp. victoriae
■ Bush Stone-curlew	Burhinus grallarius
■ Diamond Firetail	Stagonopleura guttata
■ Eastern False Pipistrelle	Falsistrellus tasmaniensis
■ Eastern Freetail-bat	Mormopterus norfolkensis
■ Gang-gang Cockatoo	Callocephalon fimbriatum
■ Greater Broad-nosed Bat	Scoteanax rueppellii
■ Hooded Robin (south-eastern form)	Melanodryas cucullata subsp. cucullata
■ Little Eagle	Hieraaetus morphnoides
■ Little Lorikeet	Glossopsitta pusilla
■ Painted Honeyeater	Grantiella picta
■ Speckled Warbler	Chthonicola sagittata
■ Spotted Harrier	Circus assimilis
■ Swift Parrot	Lathamus discolor
■ Varied Sittella	Daphoenositta chrysoptera
■ Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris

☐ Change threatened species response to gain (Tg value)

Ecosystem credits summary

Vegetation type	Area (ha)	Credits required	Red flag
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	2.59	71.99	No
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	6.91	224.45	Yes
Total	9.50	296	

Credit profiles

1. Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, (ME020)

Number of ecosystem credits created	72
CMA sub-region	Cumberland - Sydney Metro
Minimum percent native vegetation cover class	>70%
Minimum adjacent remnant area class	0-5 ha

Offset options - vegetation types	Offset options - CMA sub-regions
Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion, (ME018) Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, (ME020)	Cumberland - Sydney Metro Pittwater (Part A) Sydney Cataract - Sydney Metro Pittwater (Part B) Sydney Metro - marine zone

2. Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, (ME020)

Number of ecosystem credits created	224
CMA sub-region	Cumberland - Sydney Metro
Minimum percent native vegetation cover class	>70%
Minimum adjacent remnant area class	5-25 ha

Offset options - vegetation types	Offset options - CMA sub-regions
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, (ME020)	Cumberland - Sydney Metro

Species credits summary

APPENDIX D

Biobanking Credit Results – Biobank Sites

DRAFT

BioBanking credit report

This report identifies the number and type of credits required at a BIOBANK SITE

Date of report: 25/11/2014 Time: 6:45:43PM Calculator version: v2.1

Biobank details

Proposal ID:	0107/2014/1381B
Proposal name:	Glenfield Waste BioBank
Proposal address:	Cambridge Avenue Glenfield NSW 2167
Proponent name:	Glenfield Waste Services
Proponent address:	Cambridge Avenue Glenfield NSW 2167
Proponent phone:	02 4981 1600
Assessor name:	Jeremy Pepper
Assessor address:	Level 3 10 Kings Road New Lambton NSW 2305
Assessor phone:	02 4037 3200
Assessor accreditation:	0107

Additional information required for approval:

☐ Use of local benchmark

- Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

☐ Expert report...

☐ Request for additional gain in site value

Ecosystem credits summary

Vegetation type	Area (ha)	Credits created
Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	7.70	85.00
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	14.96	153.00
Total	22.66	238

Credit profiles

1. Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion, (ME018)

Number of ecosystem credits created	85
CMA sub-region	Cumberland - Sydney Metro
Minimum percent native vegetation cover class	>70%
Minimum adjacent remnant area class	0-5 ha

2. Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, (ME020)

Number of ecosystem credits created	141
CMA sub-region	Cumberland - Sydney Metro
Minimum percent native vegetation cover class	>70%
Minimum adjacent remnant area class	0-5 ha

3. Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, (ME020)

Number of ecosystem credits created	12
CMA sub-region	Cumberland - Sydney Metro
Minimum percent native vegetation cover class	>70%
Minimum adjacent remnant area class	5-25 ha

Species credits summary

Additional management actions

Additional management actions are required for:

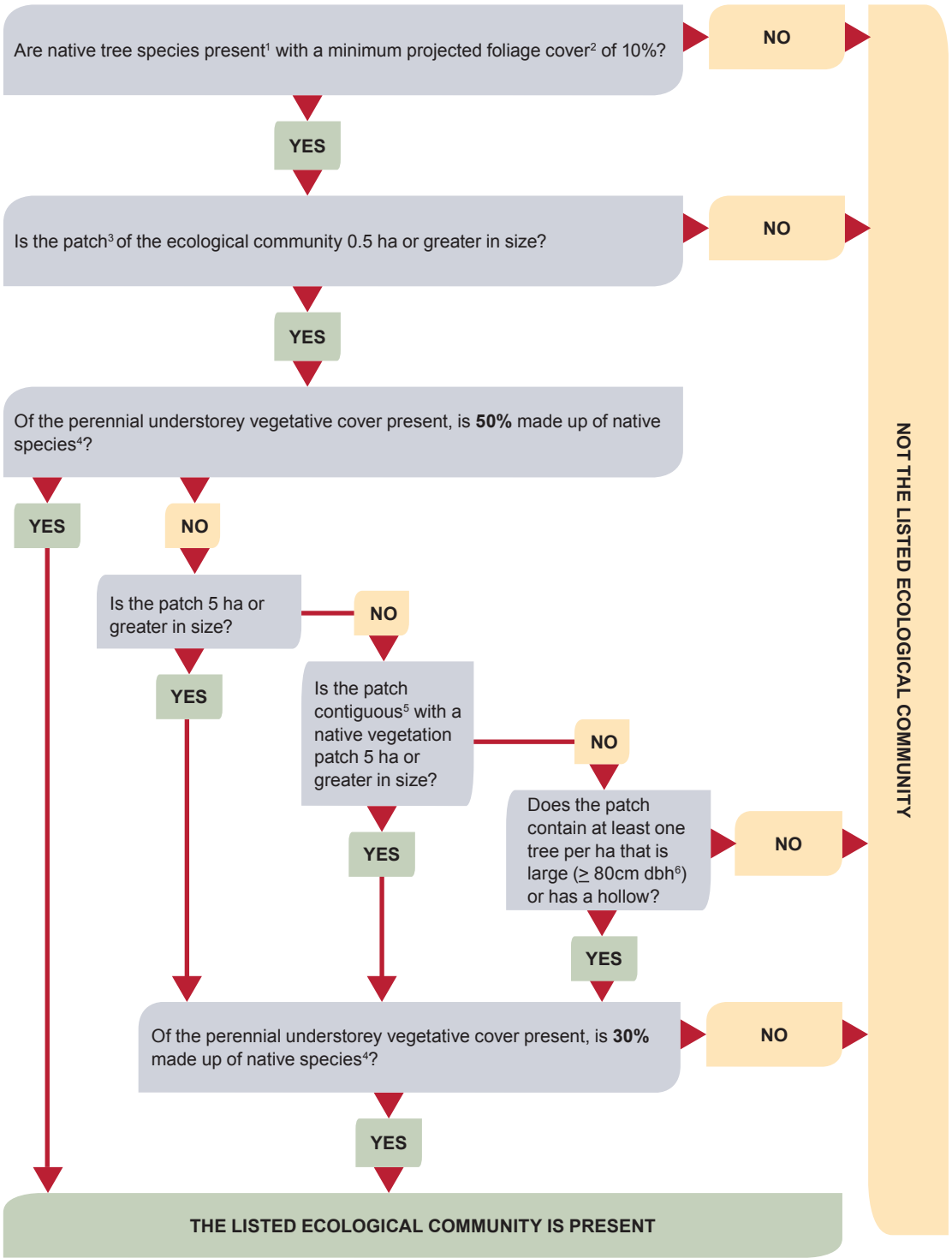
Vegetation type or threatened species	Management action details
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Exclude commercial apiaries
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Exclude miscellaneous feral species
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Feral and/or over-abundant native herbivore control
Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Fox control

APPENDIX E

DEWHA (2009) Cumberland Plain Woodland Diagnostic Chart

DRAFT

Flowchart of key diagnostic features and condition thresholds to identify the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community



Notes: See page 10 for notes.

APPENDIX F

EPBC Act Cumberland Plain Woodland patch analysis

DRAFT

CPW Patch	Size (ha)	SLR quadrats*	Typical dominant' trees in canopy	Canopy FPC** >=10%	Patch > 0.5ha	Understorey*** 50% native	Linked to Patch >5 ha	Understorey*** 30% native	CPW?
1.00	11.99		Y	Y	Y	Y			Y
2.00	0.63		Y	Y	Y	Y			Y
3.00	1.15		Y	Y	Y	Y			Y
4.00	< 0.5		Y	Y	No				No

Notes:
* refer SLR Figure 8
** 'Typical dominant' tree species present with a minimum projected foliage cover of 10% (typical spp = ***E. tereticornis, E. moluccana*** & ***E. crebra;*** dominant = 50% of the canopy)

Sub-Patch No.	SLR Veg Type	Area (ha)
9	Grey Box _ Red Gum Woodland _ Very Low	0.78
8	Grey Box _ Red Gum Woodland _ Very Low	0.25
7	Grey Box _ Red Gum Woodland _ Very Low	0.39
6	Grey Box _ Red Gum Woodland _ Very Low	0.16
13	Grey Box _ Red Gum Woodland _ Low	7.55
12	Grey Box _ Red Gum Woodland _ Very Low	0.52
5	Grey Box _ Red Gum Woodland _ Very Low	1.39
4	Red Gum - Ironbark Woodland	0.90
3	Red Gum - Ironbark Woodland	0.06
2	Red Gum - Ironbark Woodland	0.63
10	Shale Plains Woodland	0.16
11	Shale Plains Woodland	0.20
		12.99

Patch 1

SLR Quadrat	**% Native perenn understorey**
DZ1A	30
DZ2A	55
DZ2B	60
DZ2C	55
Mean % native cover:	**50**

Patch 2

SLR Quadrat	**% Native perenn understorey**
BZ1A	60
Mean % native cover:	**60**

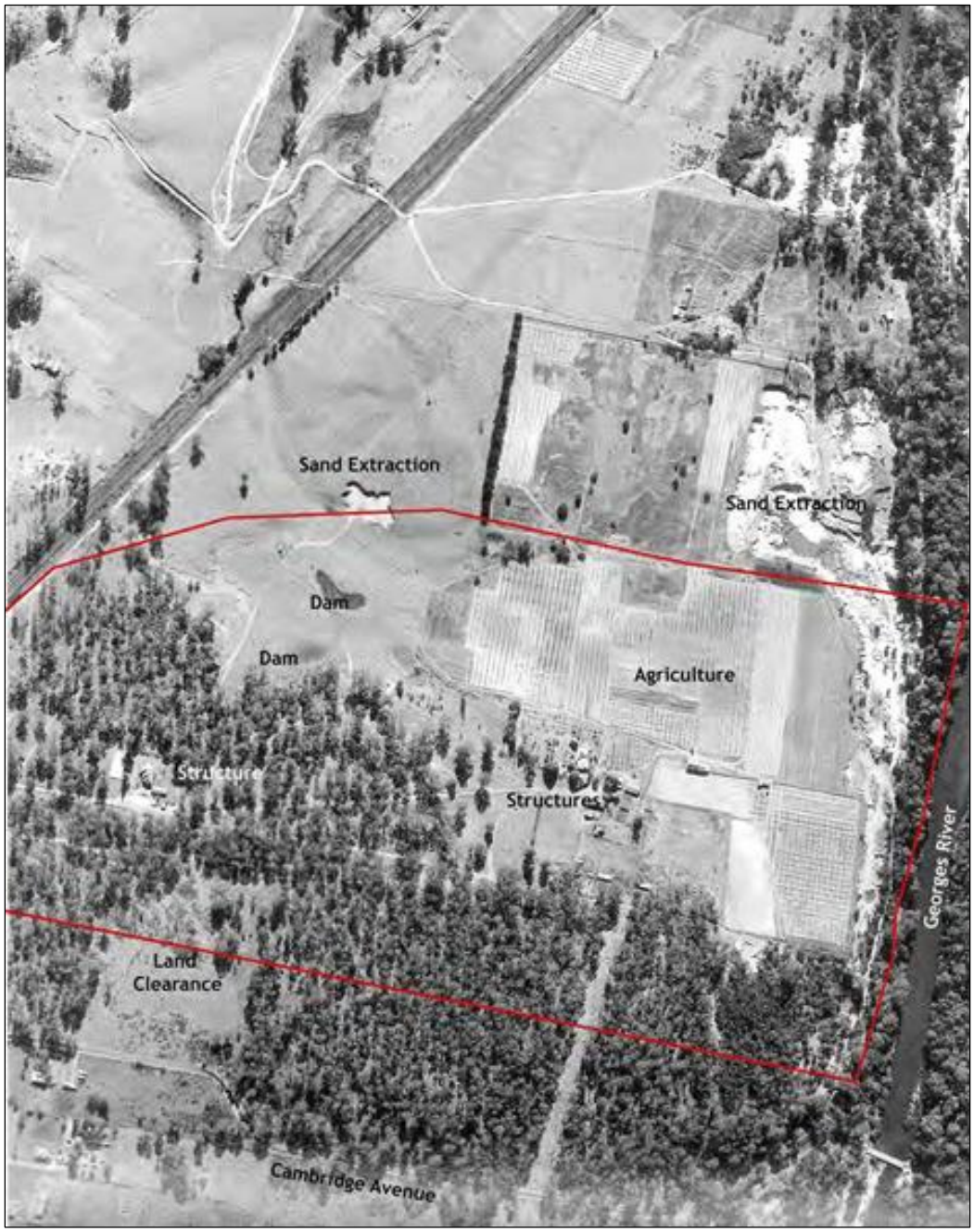
Patch 3

SLR Quadrat	**% Native perenn understorey**
BZ2C	50
Mean % native cover:	**50**

Appendix 17

Historical Aerial Photography

Historical aerial photograph of the subject area from 1951. One of the original tributaries running through the site is evident, as is the extensive agriculture in the eastern quadrant. With the exception of a structure, the western quadrant is relatively undisturbed (source: Land & Property Information Services).

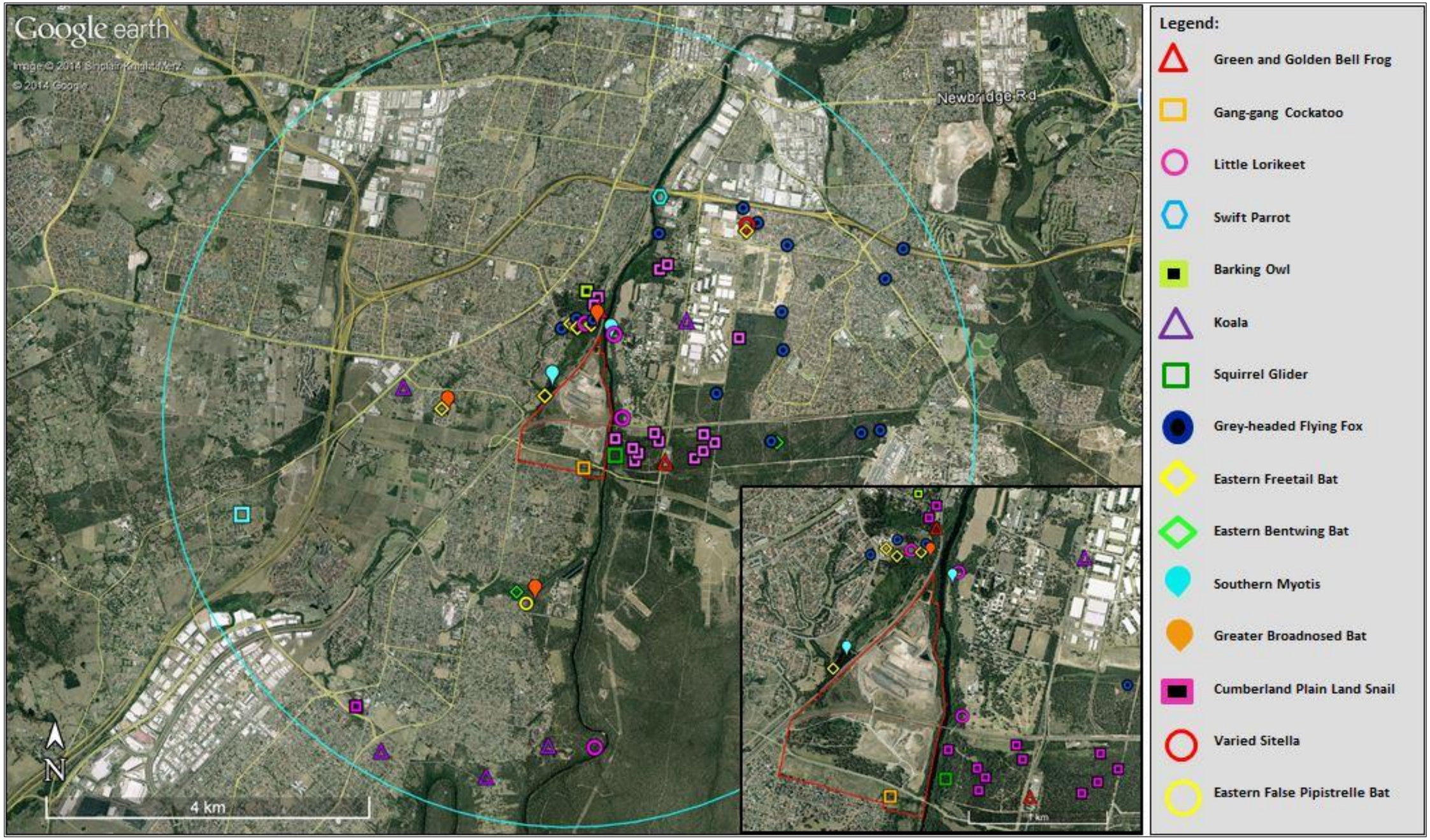


Historical aerial photograph of the subject area from 1961. By this time, extraction along the river's edge is occurring, as well as modifications to the north quadrant of the subject area. Some clearance is also occurring on the transmission line. Note the different alignment of Cambridge Avenue – this previous alignment would have impacted GWD 2 discussed in Section 8.1 (source: Land & Property Information Services)

Historical aerial photograph of the subject area from 1970. Extensive quarrying and/or sand extraction has now encroached on much of the northern quadrants of the subject area. The dam and surrounding area in the northwest have also been expanded. The west and southwest quadrants still appear relatively undisturbed (source: Land & Property Information Services).

Appendix 18

Threatened Species Mapping from OEH Database



Attachment 2.5

Aboriginal Heritage Preliminary Assessment

Glenfield Waste Disposal

Environmental Property Services Pty Ltd

4 August 2012

AHMS

ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS

AUTHOR/HERITAGE ADVISOR	Alan Williams
PROPONENT	Environmental Property Services Pty Ltd
PROJECT NAME	Glenfield Waste Disposal
REAL PROPERTY DESCRIPTION	Lot 3, DP 736881; Lot 9, DP 1155962; Lot 3, DP 735524; Lot 1, DP 113201; Lot 2, DP 333578
DATE	4 August 2014

AHMS INTERNAL REVIEW/SIGN OFF				
WRITTEN BY	DATE	VERSION	REVIEWED	APPROVED
Alan Williams	14.7.14	1	Liz Foley	
Alan Williams	4.8.14	2	Simon Duffy (EPS)	

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Glossary

Aboriginal Cultural Heritage Assessment	A document developed to assess the archaeological and cultural values of an area, generally required as part of an Environmental Assessment (EA).
Aboriginal Heritage Impact Permit (AHIP)	The statutory instrument that the Director General of the Office of Environment and Heritage (OEH) (formerly the Department of Environment, Climate Change and Water (DECCW)) issues under Section 90 of the National Parks and Wildlife Act 1974 to allow the investigation (when not in accordance with certain guidelines), impact and/or destruction of Aboriginal objects. AHIPs are not required for a project subject to Part 3A of the Environmental Planning and Assessment Act 1979 or State Significant Major Developments subject to Part 4 of the Act.
Aboriginal object	A statutory term defined under the National Parks and Wildlife Act 1974 as, 'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains'.
Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales	A series of guidelines developed by DECCW (now OEH) that prescribe the structure and content of certain Aboriginal Cultural Heritage Assessments and associated archaeological investigations/excavations. The Code of Practice applies to non-State Significant projects subject to Parts 4 and 5 of the Environmental Planning and Assessment Act, 1979.
Department of Environment, Climate Change and Water (DECCW)	Now known as the Office of Environment and Heritage (OEH).
Department of Planning and Infrastructure	A NSW government department that, among other things, is the assessing authority for State Significant developments subject to Part 3A and 4 of the Environmental Planning and Assessment Act 1979.
Director General's Requirements (DGRs)	Project specific requirements of the Director General, Department of Planning and Infrastructure (DoPI), for State Significant development under Part 3A (now superseded) or Part 4.1 of the EP&A Act.
Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales	A series of guidelines developed by DECCW (now OEH). These guidelines prescribe the structure and content of a two stage process to determine whether Aboriginal objects and/or areas of archaeological interest are present within a subject area. The results of a due diligence assessment can find that an Aboriginal Cultural Heritage Assessment may be subsequently required.
Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation , July 2005	Requirements for Aboriginal heritage assessments for projects subject to Part 3A of the Environmental Planning and Assessment Act, 1979. The Guidelines include site assessment and Aboriginal community consultation process and are now also used for Part 4.1 State Significant developments.

National Parks and Wildlife Act 1974	Legislation that protects Aboriginal cultural heritage in NSW. Part 6 of the Act outlines the protection afforded to and offences relating to disturbance of Aboriginal objects. The Act is administered by the OEH.
Office of Environment and Heritage (OEH)	Formerly the Department of Environment, Climate Change and Water (DECCW). A State government agency that manages and regulates Aboriginal cultural heritage under the National Parks and Wildlife Act, 1974.
Proponent	A corporate entity, Government agency or an individual in the private sector that proposes to undertake a development project. The proponent for this project is L.A. Kennett Enterprises Pty Ltd.

Abbreviations

ACHA	Aboriginal Cultural Heritage Assessment
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHMS	Archaeological and Heritage Management Solutions Pty Ltd
BP	Before present (AD 1950)
CHL	Commonwealth Heritage List
DCP	Development Control Plan
DECCW	Department of Environment, Climate Change and Water (now OEH)
DGRs	Director General's Requirements.
DP	Deposited Plan
DPI	Department of Planning and Industry
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
LTO	Land Titles Office
NHL	National Heritage List
NPW Act	National Parks and Wildlife Act 1974
OEH	Office of Environment and Heritage (formerly DECCW)
PAD	Potential Archaeological Deposit
PEA	Preliminary Environmental Assessment
SSD	State Significant Development

Acknowledgments

- Georgie Kennett, L.A. Kennett Enterprises Pty Ltd.
- Simon Duffy and Meaghan MacDonald, Environmental Property Services.
- Glenda Chalker, Cubbitch Barta Native Title Claimants Aboriginal Corporation.
- Elwyn Brown and Neil Sampson, Tharawal Local Aboriginal Land Council.
- Scott Franks and Margaret Crawford, Tocomwall.
- Celestine Everingham and Gordon Morton, Darug Aboriginal Cultural Heritage Assessments.
- Leanne Watson and Alyse Mervin, Darug Custodian Aboriginal Corporation.
- Gordon Workman, Darug Land Observations.
- Des Dyer, Darug Aboriginal Landcare Inc.
- Peter Falk, Peter Falk Consultancy.

EXECUTIVE SUMMARY

Background

- In mid-2012 Archaeological and Heritage Management Solutions (AHMS), was commissioned by Environmental Property Services Pty Ltd for L.A. Kennett Enterprises Pty Ltd to undertake an Aboriginal Heritage Assessment of the southern portion of the Glenfield Waste Disposal site, Glenfield, NSW. The assessment was to form two roles: 1) to provide information to inform a proposed re-zoning of the subject site from rural to industrial; and 2) to provide information to assist with the development of a proposed State Significant Development application for a recycling facility within the subject site. This report forms the basis for (1), and has been revised to include additional information obtained through (2);

- This report was undertaken in accordance with the *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*, (DEC, 2005), and the *Code of Practice for Archaeological Investigations of Aboriginal Objects in New South Wales* (DECCW, 2010), and *Aboriginal Cultural Heritage Community Consultation Requirements for Proponents* (DECCW, 2010) as specific best practice standards and processes for Aboriginal heritage assessment in NSW;

- Aboriginal consultation was undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (April 2010). The Registered Aboriginal Parties for the project are the Tharawal Local Aboriginal Land Council, Cubbitch Barta Native Title Claimants Aboriginal Corporation, Darug Aboriginal Cultural Heritage Assessments, Darug Aboriginal Landcare, Darug Custodian Aboriginal Corporation, Darug Land Observations, Peter Falk Consultancy, and Tocomwall.

Results

- Most of the subject area is heavily disturbed and/or previously developed, and the potential for preservation of archaeological materials is low. However, two areas appear to be less disturbed: an area of bushland in the western half of the subject area; and an alluvial terrace adjacent to a minor tributary of the Georges River, in the south-eastern corner of the subject area.

- Four archaeological sites were identified within the subject area:

    - Glenfield 1 (#45-5-3531): a registered site located on a track currently in use in association with the ongoing railway expansion. It is considered likely that this site is destroyed.

    - GWD 3: an isolated artefact.

    - GWD 4: an isolated artefact.

    - GWD 2: a potential archaeological deposit located on a large alluvial terrace on the bank of the Georges River, encompassing a minor tributary.

- Two further sites were initially identified, but following further investigation have been subsequently rejected as of Aboriginal origin. These were:

    - Glenfield ST (#45-5-2428): a registered site consisting of a scarred tree. It is considered that the scar is of natural rather than cultural origin.

- GWD 1: a scarred tree. It is considered that this scar is of natural rather than cultural origin.

- Responses from the Aboriginal community supported the findings and recommendations of earlier versions of this report, and provided no specific cultural values to the Aboriginal objects/sites identified through the assessment. The area was considered to have been significant to Aboriginal people in the past given the proximity of Georges River –an important resource – and recommendations on signage outlining the Aboriginal history of the area were proposed.

Recommendations

- The following recommendations are made:

  - If the boundaries of the subject area are revised to include areas not addressed in the assessment, assessment of these additional areas should be undertaken in order to manage the potential Aboriginal heritage impact.

  - Kennett Enterprises should advise all relevant personnel and contractors involved in activities within the subject area of the relevant heritage issues and legislative requirements, and the recommendations of the current assessment.

  - In the event that previously unidentified Aboriginal objects, sites or places (or potential Aboriginal objects, sites or places) are discovered within the subject area, all work in the vicinity of the find should cease, and Kennett Enterprises should determine the subsequent course of action in consultation with a heritage professional, the Registered Aboriginal Parties and the relevant State government agency.

  - If human skeletal material less than 100 years old is discovered, the Coroners Act 2009 requires that all works should cease and the NSW Police and the NSW Coroner's Office should be contacted. Traditional Aboriginal burials (older than 100 years) are protected under the National Parks and Wildlife Act 1974 and should not be disturbed. Therefore when skeletal remains are found and are suspected to be an Aboriginal burial site, an appropriately skilled archaeologist or physical anthropologist should be contacted to determine if the remains are Aboriginal objects. Should skeletal remains prove to be archaeological the RAPs should be notified. Notification should also be made to the Commonwealth Minister for the Environment, under the provisions of the Aboriginal and Torres Strait Islander Heritage Protection Act 1984.

  - Based on the findings of this study, there are no Aboriginal heritage issues that indicate that the re-zoning of the subject site from rural to industrial should not proceed.

  - Aboriginal Heritage Information Management System (AHIMS) Site cards for the two isolated objects, GWD 3 and GWD 4, should be completed and lodged with the AHIMS registrar. [Completed]

  - An AHIMS site card for the potential archaeological deposit GWD 2 should be completed and lodged with the AHIMS registrar. [Completed]

  - Following advice from an arborist, neither Glenfield ST 1 (#45-6-2428) nor GWD 1 are considered scarred trees of cultural origin. A modified AHIMS site card reflecting these findings and explaining the outcomes of this study should be lodged with the AHIMS

registrar; specific request should be made for the re-classification of Glenfield ST 1 (#45-6-2428) to the category 'not a site' in the AHIMS system. [Completed]

- It is recommended that prior to any impact from proposed development, further assessment and characterisation is undertaken of the identified Aboriginal objects/sites. Should they prove to be Aboriginal objects/sites as defined by the *National Parks and Wildlife Act 1974*, appropriate assessments and permits under this Act would be required prior to their disturbance.

- In accordance with Aboriginal community responses, consideration should be given to developing signage on the Aboriginal history of the subject area following the completion of the development.

- A copy of the final version of the assessment should be provided to each of the registered Aboriginal parties, listed above. [Completed]

- A copy of the final assessment should be lodged with the AHIMS registrar in accordance with relevant guidelines. [Completed]

1 INTRODUCTION

1.1 Proponent Details

This report has been prepared by Archaeological & Heritage Management Solutions (AHMS) for Environmental Property Services (EPS) on behalf of the proponent, L.A. Kennett Enterprises Pty Ltd (**Table 1**).

Table 1. Proponent Contact Details.

Proponent	Archaeological Advisor
Environmental Property Services Level 1, 19 Stockton Street, Nelson Bay NSW 2315 Contact Person: Simon Duffy T. 02 4981 1600 E: simonduffy@enviroproperty.com.au	Archaeological & Heritage Management Solutions Pty Ltd 2/729 Elizabeth St, Waterloo NSW 2017 Contact Person: Alan Williams T. 02 9555 4000 F. 02 9555 7005 M.0408 203 180 E: awilliams@ahms.com.au

1.2 Purpose of the Assessment

This report has been prepared by Archaeological & Heritage Management Solutions Pty Ltd (AHMS) for EPS to present the findings of a Preliminary Aboriginal Heritage Assessment of the Glenfield Waste Disposal, Glenfield, NSW (hereafter 'subject area'). The Kennett Group is proposing to re-zone the subject area from 1(a) rural to industrial.

The report also includes additional information and tasks that were undertaken as part of a new recycling facility within the subject area being assessed concurrently under Part 4 (Division 4.1) of the *Environmental Planning & Assessment Act 1979*. Additional tasks included more detailed Aboriginal consultation, and further investigation of a number of potential scarred trees identified within the subject area.

This report provides a study of the Aboriginal heritage constraints and opportunities within the subject area to inform the re-zoning. This report was undertaken in broad accordance *with Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005) as well as the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, April 2011), *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, April 2010), and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, September 2010).

1.3 Subject Area

The study area comprises the southern portion of the Glenfield Waste Disposal site, Glenfield, NSW (**Figure 1**). The site is broadly constrained to the north by the East Hills railway line (which is within

the subject area), to the east by the Georges River, to the west by the Southwest railway line and to the south by Cambridge Avenue (**Figure 2**). However, the transmission line immediately south of Cambridge Avenue is also considered as part of this study.

1.4 Proposed Development & Approval Context

The Glenfield Waste Disposal site is currently zoned rural, however given the industrial nature of the site and the current developments in the area (including the SIMTA site, and the upgrade of the Southwest rail link), the Kennett Group proposes to re-zone the site to industrial.

1.5 Report Aims and Objectives

The principle aims of the preliminary assessment are to:

- Outline the statutory requirements relevant to the subject area with regard to Aboriginal cultural heritage;
- Carry out background research to identify known Aboriginal objects, sites and places, and to identify the potential for any unknown objects and places of significance;
- Undertake Aboriginal Community Consultation in accordance with the OEH's Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010;
- Carry out a survey of the subject area to rediscover and assess known items, identify previously unrecorded items, and assess the Aboriginal archaeological potential of the subject area;
- Develop preliminary mapping of the known and potential Aboriginal cultural heritage sites in the subject area;
- Assess the archaeological (scientific) significance of any Aboriginal sites or objects that may be impacted by the proposed development;
- Identify any possible constraints to the proposed development;
- Assess the potential for direct and indirect impact to Aboriginal cultural heritage; and
- Identify and recommend measures to mitigate any potential adverse heritage impacts.

Figure 1 Location of Subject Area.

Figure 2 ***The subject area.***

1.6 Limitations

This report is based on existing and publically available environmental and archaeological information, reports about the subject area, and relevant site visits. It did not include any independent verification of the results or interpretations of externally sourced reports (except where the site inspection and field survey indicated inconsistencies). This report includes some predictions about the probability of subsurface archaeological materials occurring in certain landforms/landscapes of the subject area. The predictions were based on surface indications noted during the field investigation, and environmental context. It is acknowledged, however, that sub-surface materials may survive in landform/landscape contexts despite surface and environmental indicators that may suggest that they do not. The converse also applies.

The Aboriginal Heritage Information Management System (AHIMS) information was provided to AHMS by OEH. Information in the archaeological assessment report reflects the scope and the accuracy of the AHIMS site data, which in some instances is limited.

1.7 Investigator and Contributors

This report was written by Alan Williams, B.Sc., M.Sc., MAACAI, Senior Archaeologist, AHMS. Lisa Newell, Associate Director, AHMS reviewed and edited the original report and provided statutory and mitigation action input.

2 STATUTORY CONTEXT

2.1 Commonwealth Legislation

2.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act, 1984* (Commonwealth) was enacted at a Federal level to preserve and protect areas (particularly sacred sites) and objects of particular significance to Aboriginal Australians from damage or desecration. Steps necessary for the protection of a threatened place are outlined in a gazetted Ministerial Declaration (Sections 9 and 10). This can include the preclusion of development.

As well as providing protection to areas, it can also protect objects by Declaration, in particular Aboriginal skeletal remains (Section 12). Although this is a Federal Act, it can be invoked on a State level if the State is unwilling or unable to provide protection for such sites or objects.

No Aboriginal sites or places within the subject area are currently subject to a Declaration.

2.1.2 Environment Protection & Biodiversity Conservation Act 1999

The *Environment Protection & Biodiversity Conservation Act, 1999* (Commonwealth) provides for the protection of natural and cultural heritage places. The Act establishes (amongst other things) a National Heritage List (NHL) and a Commonwealth Heritage List (CHL). Places on the NHL are of natural or cultural significance at a national level and can be in public or private ownership. The CHL is limited to places owned or occupied by the Commonwealth which are of heritage significance for certain specified reasons.

Places listed on the NHL are considered to be of State and local heritage value, even if State or local various heritage lists do not specifically include them.

The heritage values of places on the NHL or the CHL are protected under the terms of the EPBC Act. The Act requires that the Minister administering the EPBC Act assess any action which has, will have, or is likely to have, a significant impact on the heritage values of a listed place. The approval (or rejection) follows the referral of the matter by the relevant agency's Minister.

No Aboriginal sites or places within the subject area are currently listed on the NHL or CHL.

2.1.3 Native Title Act 1993

The *Native Title Act, 1993* (Commonwealth) provides recognition and protection for native title. The Act established the National Native Title Tribunal to administer land claims by Aboriginal people. The Act also provides for Indigenous Land Use Agreements, which allow native title claimants and/or holders control over the use and management of affected land and waters.

A search of the National Native Title Tribunal Registers was undertaken on 22 May 2012, and returned the following results in the subject area:

Register Type	NNTT Reference Numbers
National Native Title Register	Nil
Register of Native Title Claims	Nil

Unregistered Claimant Applications	Nil
Register of Indigenous Land Use Agreements	Nil

2.2 NSW State Legislation

2.2.1 Environmental Planning & Assessment Act 1979

The *Environmental Planning and Assessment Act, 1979* (EP&A Act) requires that environmental impacts are considered in land-use planning, including impacts on Indigenous and non-Indigenous heritage. Various planning instruments prepared under the Act identify permissible land use and development constraints.

Where Project approval is to be determined under Part 4 (Division 4.1) of the Act, further approvals under the *National Parks & Wildlife Act, 1974* which protects Aboriginal cultural heritage in NSW are not required. In those instances, management of Aboriginal heritage follows the applicable Aboriginal assessment guidelines (the Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation, July 2005) and any relevant statement of commitments included in the Part 3A Development Approval.

It should be noted that the legislation has recently been modified, with Part 3A being modified and re-created as Part 4 (Division 4.1). Therefore, the guidelines above relate to the now defunct Part 3A process, rather than the new process. They are currently the latest guidelines available, but they may be modified as Part 4 (Division 4.1.) becomes more established.

2.2.2 National Parks & Wildlife Act 1974

The *National Parks & Wildlife Act, 1974* (NPW Act) provides blanket protection for Aboriginal objects (material evidence of indigenous occupation) and Aboriginal places (areas of cultural significance to the Aboriginal community) across NSW. An Aboriginal object is defined as:

> *"...any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains."*

An Aboriginal place is any place declared to be an Aboriginal place by the Minister for Environment & Heritage, under Section 84 of the NPW Act.

One declared Aboriginal Place is located near the subject area. Collingwood Precinct is located approximately 1.5 kilometres to the north of the subject area, and is very unlikely to be impacted by the proposal.

The provisions of the NPW Act that require various approvals or permits to disturb or discover Aboriginal deposits, objects and places are not applicable to Part 4 (Division 4.1) Projects.

2.2.3 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act, 1983* allows for the transfer of ownership to an Aboriginal Land Council of vacant Crown land not required for an essential purpose or for residential land. These lands are then managed and maintained by the local Aboriginal Land Council.

No places within the subject area are currently subject to Aboriginal Land Claims.

3 ABORIGINAL COMMUNITY CONSULTATION

3.1 General

Due to short timeframes, an initial process of informal Aboriginal community consultation was undertaken as part of the original Aboriginal Heritage Preliminary Assessment (AHMS, May 2012). This consisted of consultation with two groups known to have an interest in Aboriginal cultural heritage in the region: Tharawal Local Aboriginal Land Council (LALC) and Cubbitch Barta Native Title Claimants Aboriginal Corporation. A site visit was undertaken with representatives of the two groups.

Further Aboriginal community consultation was implemented in accordance with OEH's guidelines (*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*) as part of the proposed recycling facility within the subject area. This consultation process also explored the re-zoning proposal.

The 2010 guidelines have six broad phases:

- Pre-notification – identification of the Aboriginal parties by contacting various State government agencies.
- Notification – contacting identified Aboriginal parties and advertising in the local print media for interested Aboriginal parties.
- Presentation of Project – advising the Registered Aboriginal Parties (RAPs) of the project, which phase may involve meetings and/or site visits.
- Methodology – providing the RAPs with the proposed field methodology and information on obtaining cultural knowledge.
- Impacts and Mitigation Options – discussion of potential impacts to heritage and appropriate mitigation options before developing the report.
- Report review – review of the final report.

The consultation process has two aims. The first is to consult with knowledge holders to identify cultural places and values that may be affected by the project. The second is to obtain input on the proposed assessment methodology, and comment on the assessment report and management recommendations.

3.2 Consultation Process

A consultation log and all pertinent information sent to, and received by the registered Aboriginal parties is included in **Appendix 2**.

3.2.1 Pre-Notification

The initial stage of the formal consultation process is intended to identify Aboriginal people and organisations who may hold cultural knowledge relevant to determining the significance of Aboriginal

objects and places within the subject area. The following organisations were contacted with a request for information:

- OEH;
- Tharawal Local Aboriginal Land Council;
- Office of the Registrar, Aboriginal Land Rights Act, 1983;
- National Native Title Tribunal;
- NTSCorp;
- Campbelltown City Council; and
- Sydney Metropolitan Catchment Management Authority.

The following groups and individuals were identified as potential stakeholders:

- Cubbitch Barta Native Title Claimants Aboriginal Corporation;
- Darug Aboriginal Cultural Heritage Assessments;
- Darug Aboriginal Landcare Inc;
- Darug Custodian Aboriginal Corporation;
- Darug Land Observations;
- Darug Tribal Aboriginal Corporation;
- Gandangara Local Aboriginal Land Council;
- Gunjeewong Cultural Heritage Aboriginal Corporation;
- Peter Falk Consultancy;
- Scott Franks; and
- Tharawal Local Aboriginal Land Council (LALC).

3.2.2 Notification and Registration of Interest

The identified Aboriginal organisations and individuals were notified of the project on 1 June 2012, and invited to register an interest. The information provided included a brief description of the project and the proposed assessment, and contact details for both the proponent and archaeological consultant. In addition, an advertisement was placed in the *Campbelltown Macarthur Advertiser* on 6 June 2012, containing notification of the project, and an invitation to register an interest.

The following Aboriginal organisations registered an interest in the project:

- Tharawal LALC;

- Cubbitch Barta Native Title Claimants Aboriginal Corporation (CBNTCAC);
- Darug Aboriginal Cultural Heritage Assessments;
- Darug Aboriginal Landcare Inc;
- Darug Custodian Aboriginal Corporation;
- Darug Land Observations;
- Peter Falk Consultancy; and
- Tocomwall.

As Gandangara LALC was identified as a potential stakeholder in the pre-notification stage, initial correspondence was sent out to this group. However, Gandangara LALC did not register an interest, and it was determined that the subject area is entirely within the boundaries of Tharawal LALC.

In accordance with Section 4.1.6 of the guidelines, details of the Registered Aboriginal Parties were provided to OEH and Tharawal LALC on 18 June 2012.

3.2.3 Presentation of Information/Methodology

In accordance with Sections 4.2 and 4.3 of the OEH guidelines, a document detailing the proposed assessment methodology was sent to the RAPs for comment on 22 June 2012. This document included a detailed description of the proposed development; the contents and findings of the preliminary assessment; and the contents, tasks and activities proposed for this assessment. The document also sought information from the RAPs in regard to how they wished to be consulted, how they wished cultural information to be managed, and other relevant matters.

All responses received have been included in **Appendix 2**. In general, the responses supported the proposed methodology and assessment approach.

3.2.4 Field Investigations

Two site visits were undertaken. The first, undertaken as part of the re-zoning assessment, took place on 18 May 2012 and involved representatives of Tharawal LALC (Neil Sampson) and Cubbitch Barta NTCAC (Glenda Chalker).

The second site visit was undertaken on 25 July 2012, and was attended by representatives of Darug Aboriginal Cultural Heritage Assessments (DACHA), Darug Custodian Aboriginal Corporation (Alyce Mervin), Darug Land Observations (Gordon Workman) and Tocomwall (Margaret Crawford). This site visit similarly encompassed the entire re-zoning area, including the areas south of Cambridge Avenue.

A representative of Darug Aboriginal Landcare was not able to participate in the survey, as their relevant professional insurances were not in place. However, a meeting was held with a representative (Des Dyer) after the site visit, to discuss the results. No representative of Peter Falk Consultancy was available for the site visit.

3.2.5 Review of Recommendations and Report

Under Section 4.3.6 of the OEH 2010 guidelines, potential heritage management options require discussion and/or development with the RAPs. These were discussed in some detail throughout, and at the completion of, the field investigations. Any sites identified were discussed in relation to expected and preferred outcomes, and recommendations presented in this report have been based on these discussions.

The RAPs had an opportunity to review the original preliminary assessment report as part of the presentation of information and methodology documentation (see **Section 3.2.3**). In addition, a large assessment associated with the recycling facility was also provided to the RAPs on the 16 November 2012, and a period of 28 days provided for comment. This report was similar in findings and recommendations of the preliminary assessment. Four of the RAPs provided comments on the report (**Appendix 2**), all of which were supportive of the findings and recommendations. The only further recommendation was that DCAC sought the inclusion of signage on the Aboriginal history of the area following the development. This recommendation was included as part of the report's final recommendations.

4 ETHNOGRAPHIC INFORMATION

4.1 General

This section presents a summary of Aboriginal life at contact, as recorded by early European settlers in documents, maps, plans, images and ethnographic records. By studying these sources, we can reconstruct aspects of traditional Aboriginal lifestyle and economy. Although such accounts are fragmentary and present a biased European view of Aboriginal culture, they provide an important insight about traditional Aboriginal use and occupation of the land.

The Sydney Basin was occupied and used by Aboriginal people for thousands of years before European settlement. Within the Sydney Basin (which includes the current subject area), creeks, floodplains, swamps and woodlands provided Aborigines with rich and varied resource zones and occupation areas. Aboriginal sites across the Sydney Basin provide tangible evidence and an on-going link with the long history of Aboriginal use and occupation of this area.

4.2 The Traditional Owners

The Dharawal (also spelt Tharawal) language group are the traditional owners of the subject area, which stretches from Botany Bay South to Jervis Bay and inland to Picton and Campbelltown. This area is bounded by the traditional land of the Darug to the north and Gandangara to the west.

There is considerable ongoing debate about the nature, territory and range of pre-contact Aboriginal language groups of the greater Sydney region. These debates have arisen largely because by the time colonial diarists, missionaries and proto-anthropologists began making detailed records of Aboriginal people in the late 19th Century; pre-European Aboriginal groups had been broken up and reconfigured by European settlement activity. Sydney archaeologist Val Attenbrow (2002:34-45) has cautioned:

> *'Any boundaries mapped today for (these) languages or dialects can only be indicative at best. This is not only because of an apparent lack of detail about such boundaries in the historical documents, but because boundaries between language groups are not always precise lines'.*

In general, resource and land ownership was focused on extended family groups or clans. These groups are sometimes called local clans, territorial clans or local descent groups. A number of clans would often travel together in a larger group. Group borders were generally physical characteristics of the landscape such as waterways or the limits of a particular resource. Clans also shared spiritual affiliations, often a common dreaming ancestor, history, knowledge and dialect.

Ethnohistoric sources indicate the clan that occupied the modern day Liverpool area may have been the Gahbrogal (Attenbrow 2002:23-25), who lived along the Georges River. (Collins 1798 [1975:462]).

4.3 Subsistence

Early observers indicate that the subsistence and economy of Aboriginal groups depended largely on the environment in which they lived. The differences in available food resources between coast and hinterland influenced the diet and subsistence patterns of the groups living in each zone. The current subject area is in hinterland along the Georges River.

Inland population densities were assessed by early settlers as being lower than those on the coast. The relative scarcity of resources in the hinterland and the greater work required to procure terrestrial foods through hunting meant that the hinterland was more thinly populated than the coast (Attenbrow 2002:17).

During a trip along the Hawkesbury-Nepean during 1791, Watkin Tench wrote that hinterland people primarily subsisted on small animals and roots, probably yams. (Tench 1793 [1979]:122). However, fish, shellfish and birds were also collected from resource rich swamps and lagoons (**Error! eference source not found.**) (Attenbrow, 2002:88). Important plants and animals were also found in wetlands, providing medicines, fibres, vitamin and food sources.

Figure 3 'Aborigines Hunting Waterbirds' (Lycett 1830).

Kangaroos, wallabies, possums, koalas, bandicoots, dingoes, wombats, echidnas, fruit bats (flying foxes) and other smaller mammals were amongst the wide range of land animals that inhabited the Sydney region and were available to both coastal and hinterland people. Most Australian land animals are not migratory and therefore their seasonal availability and abundance do not vary markedly (Attenbrow 2002:70). The diet also included honey produced by native bees, as well as ants and their eggs. Many foods were harvested by tree climbing. Birds and tree dwelling mammals could be captured, and birds eggs and honey could be collected in this way (**Error! Reference source not ound.**) (Tench 1793 [1979]:126).

Open woodland areas were grazing habitat for macropods, and formed an important part of the economy of the Aborigines living on the Cumberland Plain, and were hunted with the aid of deliberately lit fires (Barrallier, 1802 [1975]: 2-3) (**Error! Reference source not found.**) or by mbushing them (Mathews in Havard, 1943c:237).

Figure 4 ***'Aborigines climbing a tree, with two Aborigines sitting beside a fire, others spearing birds' (Lycett, 1830).***

Figure 5 ***'Aborigines using fire to hunt kangaroo' (Lycett, 1830).***

Plant management practices similar to those reported in northern Australia were also conducted in the Sydney area. For instance, there is good evidence that Aborigines practiced fire-stick farming in and around Sydney (Hunter 1793 [2006:74-75]).

Plant management also enabled Aboriginal groups to broaden their range of food sources. Tench provides an interesting account of 'a poor convict' trying to eat a poisonous yam (probably Dioscorea bulbifera) and getting violently sick. Tench had seen Aborigines digging this same yam and concluded that they have a way of preparing the roots before they eat them 'which renders these last an innocent food' (Tench 1789 [1979]:83).Such plant management and processing practices were an important part of the economies of Aboriginal groups.

4.4 Shelters

Aboriginal groups in the Sydney Basin lived in bark huts and rockshelters formed from natural sandstone overhangs (**Error! Reference source not found.**). Tench described how native huts were onstructed by laying pieces of bark together in the form of an 'oven'. The end result consisted of a low shelter, which was opened at one end and sufficient to accommodate one person lying down (Tench 1789 [1979]:81).

Figure 6 'A family of Aborigines taking shelter during a storm' (Lycett, 1830).

The rockshelters referred to by Tench are abundant throughout sandstone country represented within the subject area. These shelters, especially those located close to water sources, such as those along the Georges River and Peter Meadows Creek, provided valuable shelters for Aboriginal people.

4.5 Weapons and Equipment

Many different tools and weapons were used to obtain food and raw materials, carry small items, make equipment, and for defensive and offensive purposes. These included fishing and hunting spears, spear-throwers, fishing hooks and lines, stone hatchets, shields, clubs, digging sticks, baskets, net bags and other containers, as well as canoes, animal traps, torches, small adzes and scrapers, awls, stones for pounding and beating plant foods and raw materials, stone wedges and fire. In addition, unmodified shells and stones were used opportunistically on some occasions as cutting or adzing tools and missiles. Most tools and weapons were highly portable and also multi-purpose (Attenbrow 2002:85).

Collins pointed out that the spears of the hinterland groups were distinguishable from those of the coast people as they were armed with bits of stone in place of broken oyster shell. Amongst the hinterland groups, stone was hafted into the end of the spear thrower instead of shell (Collins, 1798 [1975:122]).

Tools used for such tasks as cutting/incising, adzing, 'scraping', and beating/pounding were made of stone, bone and shell, and historical accounts indicate that the latter two materials were used for these tasks both in the hinterland and along the coast (Attenbrow, 2002:92).

The archaeological evidence of tools and equipment used in the Sydney region is limited to the more durable implement parts such as bone, shell and stone. These items are not always identifiable as a

component of a specific historically described implement, and there are also other artefacts that are not described in the historical accounts (Attenbrow 2002:86).

Aboriginal stone artefacts are an important source of archaeological information because stone is preserved for long periods of time whereas organic materials such as bone, shell, wood and plant fibres decay. Stone artefacts provide valuable information about technology, economy, cultural change through time and settlement patterning. Stone has also been used for 'relative' dating of sites where direct methods such as Carbon dating cannot be applied.

The main source locations for stone materials in the Sydney region are gravel beds and palaeo-channels associated with the Nepean-Hawkesbury and antecedent river systems and their tributaries, conglomerate pebbles in the Hawkesbury sandstone, and volcanic formations. The western half of the Sydney region appears to have a greater number and wider distribution of source locations as well a greater range of stone types suitable for making stone tools than the coastal zone. Knowledge of source locations for suitable materials for tool manufacture is of great importance in determining movements, and trade and exchange patterns of the people who inhabited the sites at which artefacts are found (Attenbrow 2002:43).

Temporal changes in stone materials used may have been associated with changes in the range of tools made (the introduction and later disappearance of Bondi points for instance) or in the way stone tools were made (increased use of the bipolar technique, for example). New subsistence methods or changes in conditions of access to raw materials sources (due to cultural factors such as changes in group alliances or group boundaries that may have affected trade and exchange) are also likely reasons (Attenbrow 2002:121).

Bipolar technique is argued to have been adopted under circumstances where there is a need to gain maximum flakes by reducing cores to their minimum flakeable size. Such circumstances include raw material scarcity. Decreased mobility is also claimed to be associated with an increased use of the bipolar technique (Attenbrow 2002:122).

Research has shown that silcrete is naturally relatively widely distributed in the Sydney region and is also present, albeit in lesser abundance, in the coastal zones and hinterland. On the Western Cumberland Plain, where sources of raw material are more common and more widespread than along the coast, the distance between source and manufacturing/use sites is usually much shorter. Within this part of the hinterland many clans would have had sources within their country (Attenbrow 2002:123).

4.6 Contact History

The decrease in population after British colonisation is well documented. The traditional life of the local people was broken through the course of the early 19th century. The impact of smallpox and influenza decimated the Aboriginal population. There was an outbreak of influenza in 1820 which killed large numbers of people in the Liverpool districts (Leah 1984).

Early European settlement of traditional hunting lands deprived Aboriginal groups of access to food sources, and camping and ceremonial sites. People who survived outbreaks of disease and massacres were forced to live in marginal areas, integrate with European settlers or resist (Liston 1988). Resistance by Aboriginal groups was often met with retaliatory action by white settlers and the colonial administration.

Factors including disease, dislocation and violence led to the demise of traditional lifestyles and a decrease in the Aboriginal population, particularly in and around the early centres of colonial settlement in Sydney, Parramatta and Liverpool.

5 ARCHAEOLOGICAL CONTEXT

5.1 General

This section discusses the regional and local archaeological context within which the subject area is situated. For the purposes of determining settlement and site location patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. This provides evidence about economic and social systems in the past and also assists archaeologists in predicting likely site types, site locations and the nature of the archaeological resource in any given area.

5.2 Regional Context

The subject area falls within the Cumberland Plain region. The archaeology of the region has been well documented through a large number of academic studies, regional management studies and impact assessment investigations over the past 30 years.

5.2.1 Early Occupation

Aboriginal occupation in the region dates back well into the Pleistocene period (i.e. before 10,000 years ago). This evidence comes from radiocarbon dates retrieved from excavated sites at Cranebrook Terrace (41,700 years before present [BP]), Shaw's Creek K2 (14,700 BP), and George & Charles St Parramatta (c.25,000 – 30,000 BP) (Jo McDonald Cultural Heritage Management, 2005; Kohen et al., 1984; Nanson et al., 1987). Other sites include Burrill Lake and Bass Point on the south coast with dates >15,000, and Loggers Shelter and Tempe House, the latter a hearth on Cooks River, both dating to early Holocene (5-10,000 years BP) (Attenbrow, 1987; Bowdler, 1976; Lampert, 1971; Jo McDonald Cultural Heritage Management, 2006). More recently, AHMS has recently obtained ages of between 12,000 – 15,000 years BP for PT12, an artefact scatter within a sand dune overlooking Hawkesbury River in Pitt Town (AHMS, 2010). The dating of Cranebrook Terrace is currently under review (Attenbrow, 2002), so at this time the George and Charles Street site is considered as the oldest reliable date for Aboriginal occupation in the Sydney region, although these dates similarly have interpretation issues.

The early occupation sites dating to the late Pleistocene/early Holocene have been found in deep stratified rockshelter deposits and within alluvial deposits, particularly on the margins of large rivers such as the Hawkesbury-Nepean and Parramatta Rivers. Drawing on this evidence, McDonald has recently argued that early occupation of the Sydney basin was focused on these primary river systems and characterised by a high degree of ‘residential mobility’ between a small number of sites (McDonald, 2005). However, the survivability and taphonomic loss of older sites in such a heavily urbanised environment must also be considered.

5.2.2 Intensification During the Holocene

The vast majority of dated sites in the Sydney region are less than 5000 years old (35 out of a total of 48 dated sites) (Attenbrow, 2002). It has been argued that this is a result of increased populations and 'intensification' of cultural activity during this period. The prevalence of sites dating to the last 5000 years may also be a result of the last significant rise in sea level, approximately 7000 years ago

(Sloss et al. 2007). The sea level rise would have submerged many of the older sites along the coastal fringe and forced Aboriginal groups westward to the current coastline.

In an attempt to better understand changes in use and occupation during the Holocene period, Val Attenbrow undertook a detailed study of the Upper Mangrove Creek catchment to the north of Sydney (Attenbrow, 2006). Attenbrow's study found significant changes in site patterning during the Holocene. She concluded that population was unlikely to have changed, but the use of sites, most notably in the last 2000 years did. This increased use of sites appeared in the archaeological record as increasing population.

Holdaway et al. (2008), similarly suggest that populations did not increase in the late Holocene, but the changes seen in the archaeological record reflect taphonomic change. Conversely, Smith et al. (2008) and Williams et al. (2010), both suggest that populations were in fact larger in the last 2000 years than any preceding period. Using radiocarbon data and regional studies, they demonstrate that there is an increasing use of sites in all locations at this time, which cannot be explained by movement of people across the landscape, but rather points to increasing numbers of people using more of the landscape.

This issue is still widely contested in archaeological literature, but whatever the reason, archaeological sites within the Sydney Basin are dominated by late Holocene sites.

5.2.3 Regional Site Patterns

More than 4,500 sites have been recorded and registered with the OEH Aboriginal Heritage Information Management System (AHIMS) for Sydney, reflecting both the wealth of archaeology in the region and the number of archaeological investigations undertaken.

The dominant site types in the Sydney region (in the 15 - 20 per cent frequency range) are rock shelters with midden deposit, rock shelters with art, rock art engravings and open artefact scatters (Attenbrow, 2002). Site types in the 5 - 15 per cent range include rock shelters with artefacts, grinding grooves and open middens (Attenbrow, 2002). The distribution, density and size of sites are largely dependent on environmental context. For instance, middens are found in close proximity to marine, estuarine and less often, freshwater bodies. Rock shelters are only found in areas of exposed sandstone escarpment and grinding grooves are found on areas of exposed flat bedded sandstone near a source of water.

A study of the regional archaeology of the Cumberland Plain by Kohen made a number of findings about site location patterns in the Sydney area. The study demonstrated that proximity to water was an important factor in site patterning. Kohen found that 65 per cent of open artefact scatter sites were located within 100 meters of permanent fresh water (Kohen, 1986). Only 8 per cent of sites were found more than 500 meters away from permanent fresh water. In short, Kohen argued that open artefact scatters are larger, more complex and more densely clustered along permanent creek and river lines. Kohen's study also found that Silcrete (51 %) and Chert (34 %) are the most common raw materials used to manufacture stone artefacts. Other raw materials include quartz, basalt and quartzite.

Although the patterns described above have been generally supported by subsequent investigations, Kohen's study was limited by a reliance on surface evidence. Extensive excavation across the Cumberland Plain has since shown that areas with no surface evidence often contain sub-surface deposits buried beneath current ground surfaces. This is a critical consideration in aggrading soil landscapes, such as those commonly found across the Cumberland Plain. In a 1997 study of the Cumberland Plain, McDonald (1997) found that:

- 17 out of 61 excavated sites had no surface artefacts before excavation.
- The ratio of recorded surface to excavated material was 1:25.
- None of the excavated sites could be properly characterised on the basis of surface evidence. In short, surface evidence (or the absence of surface evidence) does not necessarily indicate the potential, nature or density of sub-surface material.

The results of McDonald's study clearly highlight the limitations of surface survey in identifying archaeological deposits in this landscape. The study also shows the importance of test excavation in establishing the nature and density of archaeological material on the Cumberland Plain.

McDonald has undertaken over 20 years of consulting archaeology in the Cumberland Plain, and like Kohen has developed predictive models for the distribution of Aboriginal objects. In a recent publication, White & McDonald (2010:29) summarised this model as follows:

> '*Topographic and stream order variables correlate with artefact density and distribution. High artefact density concentrations may have resulted from large number of artefact discard activities and/or from intensive stone flaking. Highest artefact densities occur on terraces and lower slopes associated with 4th and 2nd order streams, especially 50 – 100 meters from 4th order streams. Upper slopes have sparse discontinuous artefact distributions but artefacts are still found in these landscape settings'.*

5.2.4 Stone Artefacts

Aboriginal stone artefacts are an important source of archaeological information because stone is preserved for long periods of time whereas organic materials such as bone, shell, wood and plant fibres decay. Stone artefacts provide valuable information about technology, economy, cultural change through time and settlement patterning. Stone has also been used for 'relative' dating of sites where direct methods such as radiocarbon dating cannot be applied. A technological sequence for stone artefacts for the region was first described in the late 1940s by Fred McCarthy and has since been refined by various authors. Currently, the most widely accepted typological sequence is known as the 'Eastern Regional Sequence' (Hiscock & Attenbrow, 1998; 2002). The ERS phases are as follows:

- Capertian – is distinguished by large uniface pebble tools, core tools, horsehoof cores, scrapers and hammerstones. Backed artefacts occasionally present. Generally dates to before 5,000 years BP.
- Early Bondaian – Aspects of the Capertian assemblage continue, but backed artefacts and ground-edged artefacts increase. Artefacts during this period were predominantly made from fine-grained silicious stone such as silcrete and tuff. Generally dated from 5000 BP to 2800 years BP.
- Middle Bondaian – Characterised by backed artefacts, particularly Bondi Points and ground-edged artefacts. Artefacts made from silicious materials, however quartz becomes more frequent. Generally dated from 2800 - 1600 BP.
- Late Bondaian – characterised by bipolar technology, eloueras, ground-edged artefacts, and bone and shell artefacts. Bondi points are virtually absent and artefacts are predominantly made from Quartz. Generally dated from 1600 BP to contact.

5.2.5 Local Context

Archaeological studies have been undertaken in the vicinity of Glenfield since the early 1980s. The earliest investigations were focussed on Lucas Heights during the development of a waste disposal facility. Studies by Silcox, Brayshaw, Attenbrow & Negerevich, Koettig and McDonald recorded extensive numbers of sites in the vicinity of Bardens and Mill Creeks, located some 10 -15 kilometres to the south-east of the subject area (Silcox, 1980; Brayshaw, 1982; Attenbrow & Negerevich, 1981; Koettig & McDonald, 1984). These sites were predominantly rockshelters containing art and/or deposits. Studies that have been carried out in close proximity to the subject area are shown **in Figure 7**.

Investigations carried out at a number of the sites indicate that initial occupation of this area commenced relatively late in the Holocene period, that is, less than 3000 years ago and continued until close to the time of European arrival. Cultural material present in excavated deposits reflects a predominantly 'inland' economy with minimal exploitation of estuarine resources (Navin Officer Heritage Consultants 1997: 4-45).

Similar findings occurred on surveys undertaken in Wedderburn (20 kilometres south of the subject site) by Smith & Crew and Sefton - an investigation of Yeoman's Estate located eight sites, including five rockshelters, two grinding grooves and a culturally modified tree (Smith & Crew, 1988, 1989; Smith, 1991; Sefton, 1981, 1982, 1986, 1987, 1990).

On the nearby Cumberland Plain, studies by Koettig and Hughes, and Boot at East Hills-Glenfield Railway and Wattle Grove, respectively, revealed several artefact scatters (#45-5-0889, #45-5-0890, #45-5-0891, #45-5-0892,#45-5-0972, #45-5-2355, #45-5-2369 (Koettig & Hughes, 1983; Boot, 1990, 1992, 1993, 1994a, 1994b).

Of note was an extensive study of the Holsworthy Military Area (immediately south of the subject site) as a possible location for the second Sydney airport in the late 1990's. Navin Officer built on extensive studies already undertaken of the military area by the Sydney Prehistory Group and Australian Museum Business Services. Before the field investigations, some 295 sites were documented (Navin Officer Heritage Consultants 1997: 4-57).

At the completion of the field inspections, Navin Officer documented over 800 archaeological sites in the Holsworthy Military Area. These sites were almost exclusively constrained to the deeply incised creek valleys and ravines running through the military area, and were comprised of isolated finds (n=37), artefact scatters (n=19), culturally modified trees (n=48), grinding grooves (n=185), open engraving sites (n=15), open sites and grinding grooves and engravings (n=10), rock shelters (n=659) (Navin Officer Heritage Consultants 1997: 5-14).

In 2002, Jim Kelton carried out an archaeological assessment of a proposed sewerage transfer from the Hoxton Park Release Area to the Liverpool Sewerage Treatment Plant (STP) (Central West Archaeology and Heritage Services, 2002). The development involved laying 7 kilometres of pipeline between the two locations using trenching and tunnelling methods. No Aboriginal sites or objects were located during the field survey. Two PADs, however, were identified adjacent to the corridor: on the northern and southern banks of Cabramatta Creek, Hoxton Park (adjacent to the Hinchinbrook Creek junction) and the northern bank and adjacent alluvial terrace of the second crossing of Cabramatta Creek (approximately 400 meters east of the Hinchinbrook Creek junction). It was recommended that archaeological monitoring of development works be carried out in these two areas.

More recently, studies by Cultural Heritage Connections, AHMS, AMBS and Mary Dallas have been undertaken in the vicinity of the subject area. Cultural Heritage Connections undertook a preliminary assessment of the proposed Southern Sydney Freight Line situated just west of the Georges River. This assessment, running from Macarthur to Ingleburn identified 17 archaeological sites in close proximity to the subject area. These sites were predominantly artefact scatters (n=10), culturally

modified trees (n=5) and a potential archaeological deposit (Cultural Heritage Connections, 2006). No sites were recorded within the study area.

A further study by AMBS on the Glenfield railway station was undertaken in 2008. Part of the AMBS investigation for the station encompassed the northwestern part of the subject site. The survey identified two sites, an isolated object on a track between the railway track and the subject site; and a scarred tree located in the western quadrant of the subject site; and an area of potential sensitivity was also observed (**Figure 8**).

Mary Dallas undertook an assessment of a proposed housing subdivision in south Casula – just north and west of the subject area on the west side of the Georges River (Mary Dallas, 1988). The study identified two artefact scatters and three culturally modified trees on a series of spurs overlooking Glenfield Creek (#45-5-0720, #45-5-0721, #45-5-0722, #45-5-0723, #45-5-0724).

In 2001, Steele and Dallas undertook an assessment of the Moorebank Defence area (Steele & Dallas, 2001) to the northwest of the study area. The study indicated that the defence area had been completely impacted by the past activities, and that no Aboriginal sites were, or were likely to be present. A follow up study was undertaken by AHMS in 2012 on the Moorebank Defence area, as part of the Sydney Intermodal Terminal Alliance (SIMTA) development. This study investigated both the defence site, and a proposed railway that ran along the northern edge of the Eastern Hills railway line (and included then northern portion of the Glenfield Waste Disposal). The assessment concurred with Steele & Dallas (2001), but did highlight several areas of archaeological interest in the bushland surrounding the Georges River (**Figure 9**).

5.2.6 AHIMS Search Results

A search of the Aboriginal Heritage Information Management System (AHIMS) database, maintained by OEH, was carried out on 11 May 2012.

This search identified 96 sites in an area of some 10 km2 centred on the subject site. Seven of these sites occur within 1 km of the study area. The 96 sites were composed of 40 (42%) artefact scatters, three (3%) shelters with art, six (6%) scarred trees, five (5%) isolated objects and 42 (44%) unidentified (**Figure 10**). Several further isolated finds and three PADs were also identified by AHMS 2012 study of the nearby SIMTA site (**Figure 9**), which have not yet been listed on the AHIMS database.[1]

In general, these sites are focussed in south Casula, Wattle Grove and Holsworthy Military Area. The sites to the west (#45-5-0720, #45-5-0721, #45-5-0722, #45-5-0723, #45-5-0724) were identified by Mary Dallas during an assessment of a proposed sub-division. Sites to the east were predominantly identified by Dr. Phil Boot as part of the assessment works for the suburb of Wattle Grove. Those within Holsworthy Military Area were most likely identified as part of Navin Officer's extensive study of the area in 1997.

Seven sites are located in, or within 1,000 metres of, the subject area. Of most relevance are two sites located within the study area - Glenfield 1 (#45-5-3531) and Glenfield ST (#45-6-2428), an isolated object and culturally modified tree respectively. Both sites are located in the northwest quadrant of the study area. The two sites were recorded by AMBS in 2008 as part of the Glenfield station study (Section 5.2.5).

[1] Note: due to some sites retaining multiple site types (for example a rockshelter with a grinding groove), the total number of AHIMS entries may not reflect the actual number of sites types recorded.

The isolated object was a piece of heat-shattered silcrete on a track near the railway. It could not be relocated as part of the site visit, but is considered probably destroyed following the extensive development of this area as a result of the Glenfield Station and Southwest Freight line developments.

The scarred tree was identified in a similar area near the East Hills railway line. The site was relocated as part of this study. The tree identified is very young, probably less than 50 years old, and combined with the irregular scar on the tree is unlikely to be of cultural origin in AHMS' opinion. A similar view was held by the representatives of the Registered Aboriginal Parties. However, a review of the AMBS report indicates that this scarred tree was originally recorded by Anthony English several years previously. Given its original identification may have occurred prior to the widespread use of hand held GPS, it is considered that Anthony English may have been referring to another scarred tree found some 100 m northeast of AMBS' find (see Section 8.1), but that the spatial recording of the tree may have been poor historically. Further analysis of this other tree, similarly, considered it to be of natural origin (Section 8.3.1).

5.3 Summary

In summary, studies in the local area have revealed extensive occupation by prehistoric populations. Excavations of rock shelters in Lucas Heights indicate that this occupation probably occurred in the late Holocene (<3000 years ago) during a period of significant change in prehistoric populations. This change most likely involved population intensification, a greater reliance on these areas, and/or perhaps the loss of coastal resources through sea level rise. Within the Hawkesbury sandstone country, sites are almost exclusively rock shelters or grinding grooves, all located in deeply incised valleys or ravines. Within the subject area and the surrounding Cumberland Plain, archaeological sites are dominated by artefact scatters, culturally modified trees and potential archaeological deposits. Studies within the local area and including the subject area identified the presence and/or potential for such site types to occur.

Figure 7 ***Map of locations of heritage assessments near the subject area (outlined in red). 1 – Dallas (1988); 2- Dallas (2006); 3- Steele and Dallas (2001); 4- Central West Archaeology and Heritage Services (2002); 5- Boot (1990, 1992, 1993, 1994a, 1994b); 6- Navin Officer (1997); 7- Cultural Heritage Connections (2006); 8 – AHMS (2012); 9 – AMBS (2008).***

Figure 8 ***Map showing the scarred tree and zones of archaeological sensitivity identified by AMBS in 2008 within the subject area (source: AMBS, 2008).***

Figure 9 ***Map showing archaeological findings of AHMS 2012 study of the SIMTA site. Isolated artefacts (shown by numbers) and potential archaeological deposits (PADs) are presented. Area 1 (shaded blue) along the western edge of Georges River was identified by Aboriginal participants as an area of cultural interest. (Source: AHMS, 2012).***

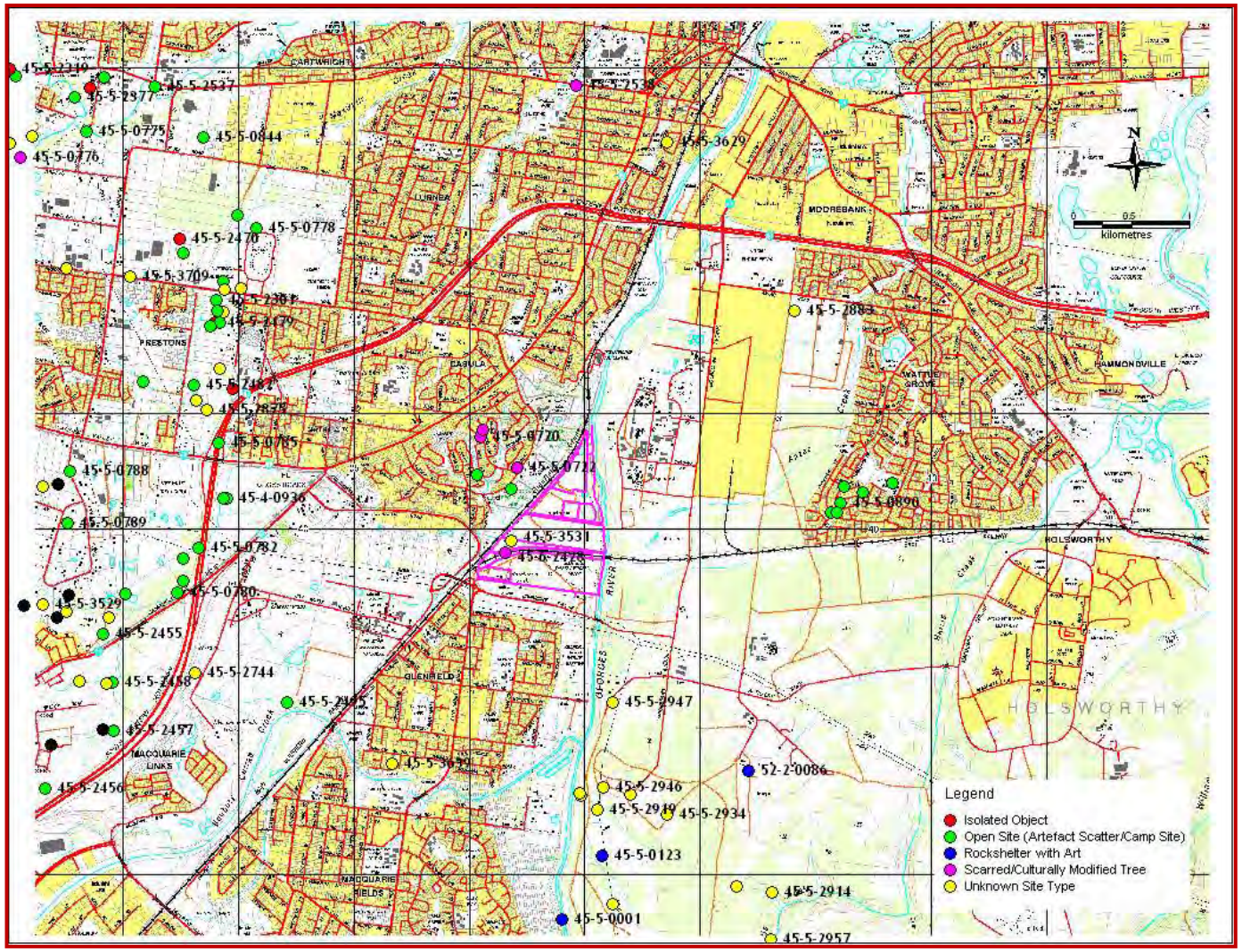

Figure 10 Map of archaeological sites previously recorded in the Glenfield Waste Disposal site (purple outline) and documented in OEH's AHIMS database.

6 LANDSCAPE CONTEXT

Environmental and landscape characteristics contribute to the availability of natural resources. In turn, landscape characteristics and available natural resources influence land use. Ultimately, these affect the types of archaeological sites that may exist in a given area. A determination of the past environmental context is essential to develop accurate models of cultural activity, site distribution patterns and the archaeological potential of any given area. The environmental context of the subject area is discussed below.

6.1 Landscape Characteristics

The subject area is situated adjacent the Georges River, a significant fresh water and food resource during prehistoric occupation. Fluvially derived sediments would have created a landscape that may have resembled a series of sloping river terraces, however, recent urban activities have heavily modified the landscape. Specifically, the Glenfield Waste Disposal has led to extensive earthworks across most of the subject site.

Based on aerial photographs, the subject site appears to have been originally composed of a low hill to the west, gently sloping down towards the Georges River in the east. A minor tributary running primarily along the western side of the railway line, also ran through the centre of the waste disposal site prior to the East Hills railway line. Topography varies between 16 and 22 meters AHD, and the entire site is above the 1 in 100 year flood line. Historical information suggests that the original vegetation would have been open, most likely Cumberland Plains Woodland, given its preference for the Ashfield Formation geology of the subject area. At present, vegetation on much of the subject area is limited to grassed areas between extensive modifications and other structures, although relatively undisturbed bushland is present in the south and western parts of the subject site, and running along the edge of Georges River. While this bushland appeared young visually, historical photographs suggest it is at least 80 years of age.

6.2 Geology and Soils

The subject site is located immediately north of Holsworthy Barracks (Liverpool Military Area), which is located on the Woronora Ramp geological feature that forms part of the south side of the Sydney Basin. The Woronora Ramp gradually rises from the Cumberland Plain in the north and terminates at the Woronora plateau to the south of the subject area.

Based on Department of Mineral Resources 1:100,000 Geological Series Sheets of Wollongong - Port Hacking and Penrith, the general area contains Mesozoic and Cainozoic geology. The former includes Hawkesbury Sandstone, Mittagong Formation and Ashfield Shale, while the latter includes Pliocene clayey quartzose sands and Quaternary alluvial deposits. Given the northern part of the waste disposal is subject to sand extraction, it is presumed that the subject site is part of the Ashfield Formation.

More recent Quaternary deposits, specifically those of Pleistocene and Holocene age, have high potential for both natural and anthropogenic information. The Georges River, Williams Creek and Harris Creek all contain evidence of Quaternary deposits, although presence of these deposits within the subject site is yet to be specifically demonstrated.

The 1:100,000 Penrith Soil Landscape Series Sheet 9030 indicates that the subject site includes soils from the Berkshire Park Soil Group (Bannerman and Hazelton, 1990). These are characterised as shallow clayey sand soils with frequent ironstone pisoliths, and are typically found on low rises and terraces of the Hawkesbury/Nepean river systems. In some area, Luddenham Soil Landscape may also occur (Bannerman and Hazelton, 1990:63). These are characterised by loams overlying clays, and dark prairie topsoils, and some sandy clays and sandy loams, on undulating low hills overlying Wianamatta Group Shales.

6.3 Vegetation

The natural vegetation of a landscape is an important consideration in an Aboriginal cultural heritage assessment because it provides an indication of the natural resources once available to Aboriginal people. Bark from trees could be stripped to make canoes, shields and other items. The vegetation itself could provide food resources, such as edible plants, and also habitats for animals, such as possums and birds, which could be hunted.

The original vegetation associated with the Berkshire Park Soil Landscape within the Sydney region is open forest. Species would have typically included broad-leaved ironbark (Eucalyptus fibrosa), narrow-leave apple (Angophora bakeri) and scribbly gum (E. Sclerophylla) and paperbarks (Melaleuca sp.) (Bannerman & Hazelton 1990: 75-77). A study of the nearby SIMTA site also identified the presence of Sugar Gum (Eucalyptus cladocalyx), Forest Red Gum (E. tereticornis), Scribbly Gum (E. sclerophylla) and native grasses, including Kangaroo Grass (Themeda australis), Sand Couch (Cynodon dactylon) and Danthonia sp. (LesryK Environmental Consultants, 2000 cit. AHMS, 2012).

The Luddenham Soil Landscape originally supported wet sclerophyll forest (Bannerman & Hazelton 1990:63).

Following the site visit, it was evident that most of the study area comprised of low-lying grasses intermixed with heavily modified landscapes (such as areas of landfill, tracks or structures). The transmission line to the south was also dominated by low grasses. However, the south and western quadrants of the subject site did appear to have an open woodland dominated by broad-leaved ironbark (E. fibrosa) and scribbly gum (E. Sclerophylla), with occasional forest red gum (E. tereticornis). While the appearance of this woodland was relatively young, historical photographs suggest that the woodland has been present on the site for at least 80 years. This type of woodland was also present on the tributary at the eastern end of the transmission line.

Vegetation on the Georges River was not observed in detail due to access issues, but appeared to be characterised as a dense woodland including broad-leaved ironbark (E. fibrosa), scribbly gum (E. Sclerophylla), and forest red gum (E. tereticornis). Dense bushes of exotic species (such as lantana) were also present.

6.4 Previous Land Use and Disturbance

A review of historical photographs of the region since 1930 show that significant impact has occurred to several parts of the subject site (**Figures 11 - 17**). Early photographs suggest that impacts between 1930-1960 were relatively minor – the eastern quadrant of the study area was used primarily for agriculture, while the western quadrant was untouched bushland. The house still present in the

western quadrant is present by 1950 (**Figure 12**). Some suggestion that the tributary had been modified, as well as the installation of a large dam was also present through this period. The transmission line to the south was also bushland with some impacts through the earlier alignment of Cambridge Avenue in this area.

From 1960, more significant activities begin to occur. In the 1960 and 1974 photographs, sand or other quarrying extraction is evident in several parts of the northern portion of the waste disposal site, and these extend into the east quadrants of the subject site (**Figures 13** and **14**). The dam in the western quadrant is more substantive, and bushland has been removed from most of the eastern quadrant, as well as most of the transmission line.

By 1982, most of the eastern quadrant of the subject site is undergoing extensive earthworks (**Figure 15**). This is probably the earliest beginnings of the land fill that is still ongoing today. Cambridge Avenue has been re-aligned to its current location by this time. This photograph is one of the clearest to demonstrate the first order tributary running from the south into the eastern quadrant of the transmission line – indicating the tributary is not a later landscape modification.

Photographs from 1994, 2002 and present day, all show continuing development in the region. By this time the Eastern Hills railway has gone through the site, and further extensions of the landfill have occurred (**Figures 16** and **17**). The bushland in the western quadrant is still relatively untouched, although frequent tracks and roads have been put through them.

The transmission line to the south was not evident in any of the historical photographs and suggest development since 2002, it is unclear the level of impact this installation would have had on the soil profile in this region.

In summary, the eastern and northern quadrants of the subject site appear heavily impacted by past extraction and landfill activities (**Figure 18**). The western quadrant appears to have received far less impacts historically, but tracks, structures and dams are still present throughout. With the exception of vegetation clearance and the installation of transmission pylons, the transmission line appears to have been less disturbed than other parts of the site. Along with small parts of the bushland in the west of the subject site, the tributary located in the eastern quadrant of the transmission line appears to be the most undisturbed part of the site.

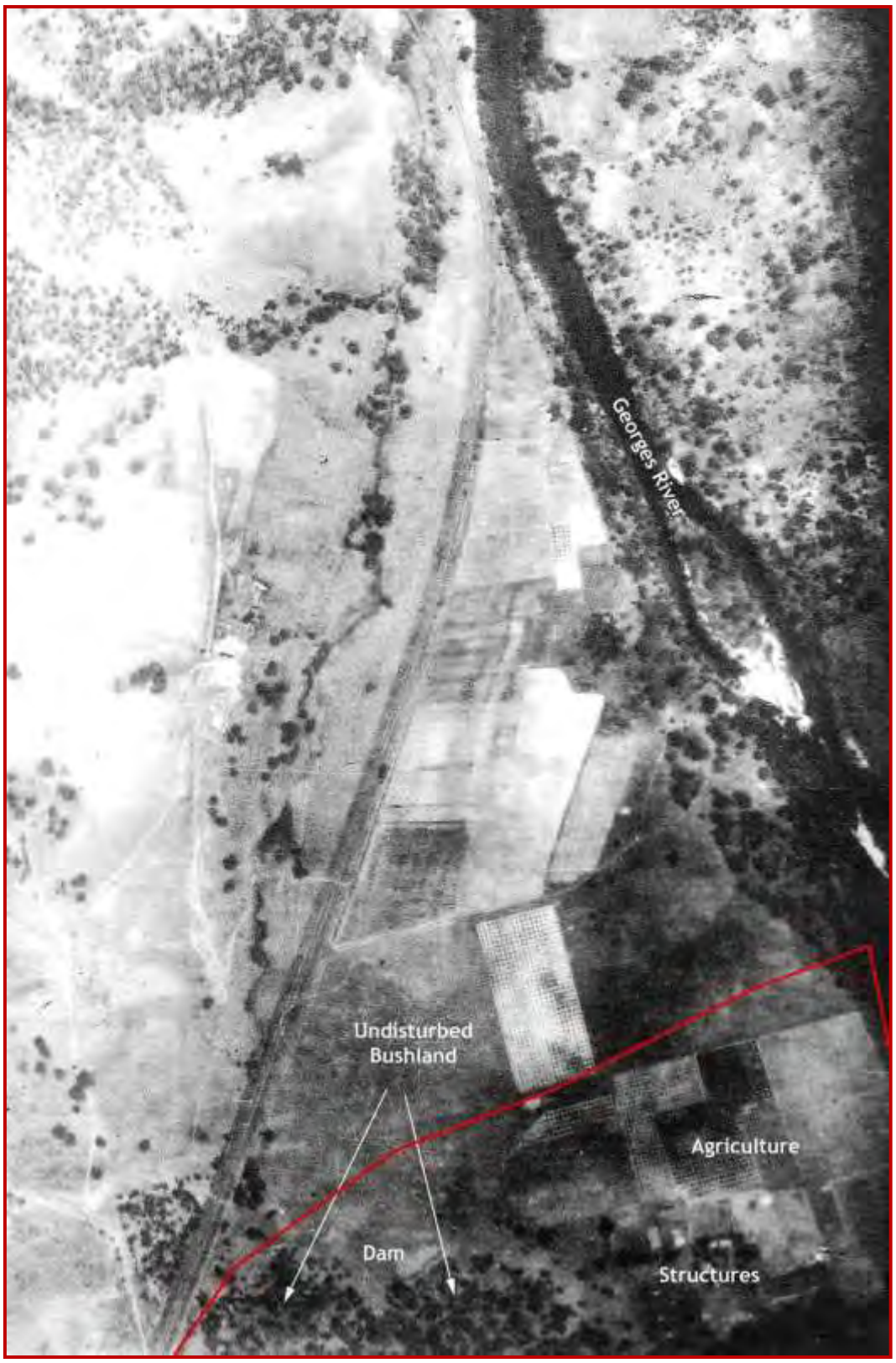

Figure 11 ***Historical aerial photograph of the subject area from 1930. While only capturing a small part of the subject area, it does show the undisturbed bushland in the southern and western quadrants, and the agricultural practices in the eastern quadrant (source: Land & Property Information Services).***

Figure 12 ***Historical aerial photograph of the subject area from 1951. One of the original tributaries running through the site is evident, as is the extensive agriculture in the eastern quadrant. With the exception of a structure, the western quadrant is relatively undisturbed (source: Land & Property Information Services).***

Figure 13 ***Historical aerial photograph of the subject area from 1961. By this time, extraction along the river's edge is occurring, as well as modifications to the north quadrant of the subject area. Some clearance is also occurring on the transmission line. Note the different alignment of Cambridge Avenue – this previous alignment would have impacted GWD 2 discussed in Section 8.1 (source: Land & Property Information Services).***

Figure 14 ***Historical aerial photograph of the subject area from 1970. Extensive quarrying and/or sand extraction has now encroached on much of the northern quadrants of the subject area. The dam and surrounding area in the northwest have also been expanded. The west and southwest quadrants still appear relatively undisturbed (source: Land & Property Information Services).***

Figure 15 ***Historical aerial photograph of the subject area from 1982. Sand extraction and/or landfill has now extensively impacted the north and eastern quadrants of the subject area. The transmission line to the south has been cleared. Several earthworks in the northern and parts of the western quadrant may relate to the East Hills railway constructed during this period (source: Land & Property Information Services).***

Figure 16 ***Historical aerial photography of the subject area from 1994. The subject area has largely reached its current appearance by this stage, with extensive landfill in the east, and sand extraction to the north. Note the East Hills railway is now constructed. The western and southern bushland still appears relatively undisturbed, as do parts of the small tributary located in the southeast corner of the subject area (east end of the transmission line) (source: Land & Property Information Services).***

Figure 17 ***Historical aerial photography of the subject area from 2002. Few changes are different from 1994 – the landfill operations and sand extraction are more formalised, but impacts remain largely the same for the purpose of this study (source: Land & Property Information Services).***

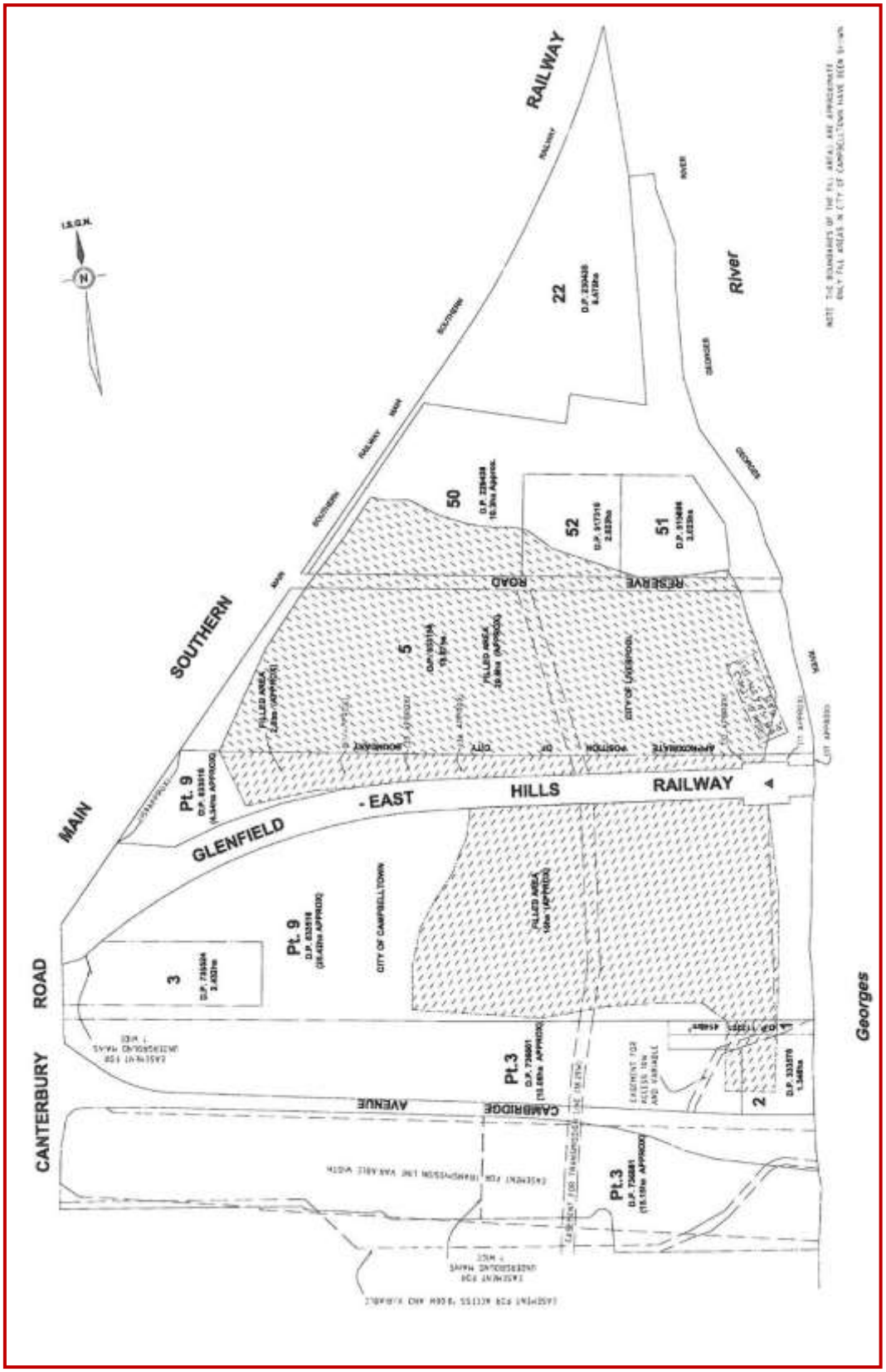

Figure 18 Map showing the current extent of landfill (hatched) within the subject area.

7 REGIONAL CHARACTER

This section provides a synthesis of the archaeological and environmental information for the subject site to identify key issues and develop predictions in relation to the presence of Aboriginal objects.

7.1 Archaeology

Based on the regional and local archaeological context of Glenfield, a number of conclusions can be reached regarding the Aboriginal archaeological potential of the subject area.

It is apparent that Aboriginal people have occupied and utilised the region within the Sydney Basin for a considerable period of time, certainly throughout the Holocene (10,000 years ago to present). Some evidence also points to occupation in the late Pleistocene (10,000 - 50,000 years ago). Archaeological studies pertaining to the region suggest that site distribution is characterised by proximity to permanent water sources, and landform types such as lower slopes, river terraces and alluvial flats. Importantly, sites are generally found above the flood zone, especially in the south-west of Sydney where the upper catchments of several large rivers are located.

The subject area is primarily situated above the flood zone associated with the Georges River and two other minor tributaries (one of which is no longer evident). Therefore, it is considered an ideal location for archaeological material to occur based on regional patterns.

Archaeologically, the local area is characterised by two very different types of land use strategy in the past. In the Hawkesbury sandstone country, most evident in the Holsworthy Military Area to the south of the subject site, archaeological sites are dominated by rock shelters and grinding grooves. These sites are generally constrained to the valley floors and ravines where sandstone caves and overhangs occur. These types of sites are extensive in the local area with the military area retaining over 600 rock shelters. On the surrounding Cumberland Plain, encompassing Liverpool, Moorebank, and the subject area, sites were generally artefact scatters, isolated finds, culturally modified trees and/or potential archaeological deposits. Studies both to the east and west of the subject area have identified the presence of artefact scatters and culturally modified trees in close proximity to the subject area.

7.2 Existing Disturbance

While the regional and local archaeological records suggest high potential for archaeological material within the subject area, the past land use history indicates significant disturbance has occurred reducing the likelihood of any such sites surviving.

Historical aerial photographs show that the subject area underwent significant ground disturbance and earthworks since the 1970s through to the present day, and included the levelling, cutting and filling of large sections of ground for sand extraction and/or landfill use. While the area of highest potential would have been in the vicinity of the two creeks and the banks of Georges River, historical photographs show that these areas (with the possible exception of the transmission line) have been subject to extensive earthworks.

Only two areas appear to have been only minimally disturbed in the past, a section of bushland in the western quadrant of the subject site, and a tributary (and surrounding landform) in the eastern

quadrant of the transmission line. In relation to the bushland, several structures, trees and a large dam are present suggesting some impacts have occurred through the area.

A section of bushland to the south of the subject site also appeared to be relatively undisturbed based on the historical photography, but site inspection (Section 6.4) demonstrated that extensive ground disturbance (from heavy machinery) had occurred.

It is acknowledged that fluvial sand beds and terraces have been excavated elsewhere in the Sydney basin and revealed artefacts at considerable depth. AHMS personnel have investigated other sites in Sydney where the fill was placed directly over the top of the original soil profile, and it was possible to re-expose and re-investigate the original deposits, but these were generally small sites (<3,000 m2).[2] However, the level of disturbance in many of parts of the study area (such as the sand extraction) precludes the possibility of deep deposits occurring. Further, given the industrial scale and depth of the fill across the site, it is considered unlikely that an intact A and A2 soil profile would be present in most areas.

7.3 Site Predictions

A review of the archaeology of the region suggests that the subject site would have high potential for Aboriginal objects/sites to occur. The location of the subject site adjacent Georges River, above the flood zone, and in close proximity to two tributaries all increase the likelihood of the region being used by Aboriginal people in the past.

However, a review of the historical land use of the study area demonstrates that several parts of the subject site have experienced significant modification – most likely leading to the destruction of any Aboriginal objects/sites that may have been present. Specifically, the use of the subject site for both sand extraction and as a landfill, have led to the complete destruction of large parts of the eastern, northern and southern quadrants of the site.

Only two areas within the subject area appear to have both potential for Aboriginal objects/sites to occur and have not been extensively impacted: 1) the bushland in the western quadrant of the study area; and 2) the tributary in the eastern quadrant of the transmission line (**Figure 19**).

Historical photographs suggest that the bushland in the western quadrant of the subject site has been present since before 1930, although several minor impacts (e.g. tracks) have occurred throughout. This bushland would have been within 200 m of a former tributary (which has now been completely destroyed by the East Hills railway) and therefore is of archaeological interest.

The tributary to the east of the transmission line, similarly, reveals limited to no impact since the 1930s, although it must be acknowledged that a transmission line has been installed in this area since 2002.This tributary joins, and is in close proximity to Georges River (<200 m), and therefore has high potential for Aboriginal objects/sites to occur.

Based on the above observations and combining evidence drawn from our understanding of settlement patterning, geotechnical investigation and assessment of site disturbance, the subject area is characterised in accordance with the following classes of archaeological sensitivity (**Figure 19**):

[2] AHMS has undertaken numerous excavations in the region. In many cases, an intact soil profile (comprised of A and A2 horizons) were found beneath varying levels (generally <50 cm) of introduced fill.

- High Archaeological Sensitivity: These areas appear to be relatively undisturbed, and are likely to be above the 100 year flood-level. They are located close to fresh water on river and creek flats, and river terraces, all of which are landforms considered to have Aboriginal archaeological potential. Soil consistent with the original soil profile in the area was identified in these areas.

- Low Archaeological Sensitivity: All areas that have been previously impacted by historical footings/foundations and/or more recent development, including quarrying/sand mining, construction of the East Hills Rail Line. These areas are considered to be significantly disturbed and unlikely to retain any in situ Aboriginal archaeological deposits

.

Figure 19 ***Map of archaeological sensitivity based on the background review. Areas shaded in red are considered highly disturbed and retain little potential for Aboriginal objects to occur.***

8 SITE INSPECTION

8.1 Background

Two site inspections were undertaken; the first on 18 May 2012, to inform the preliminary assessment (AHMS, May 2012); and the second on 25 July 2012 for the proposed recycling facility. Both site visits investigated the entire subject area. The participants were as follows:

18 May 2012	25 July 2012
Simon Duffy, EPS	Simon Duffy, EPS
Meaghan MacDonald, EPS	Alan Williams, AHMS
Alan Williams, AHMS	Fenella Atkinson, AHMS
Neil Sampson, Tharawal LALC	Gordon Morton, DACHA
Glenda Chalker, Cubbitch Barta NTCAC	Alyse Mervin, DCAC
	Gordon Workman, DLO
	Margaret Crawford, Tocomwall

A meeting on site was also undertaken with Des Dyer (Darug Aboriginal Landcare Inc) on 25 July 2012.

The site inspections focussed on re-locating previously recorded Aboriginal sites and areas where low disturbance had occurred. These areas were primarily located along the southern and western quadrants of the subject site, and the transmission line south of Cambridge Avenue. The proposed development footprint of the recycling facility was also inspected.

A cursory inspection was undertaken of areas in the eastern and northern quadrant of the subject site, but these areas contained a current landfill operation and the East Hills railway line, and were clearly heavily disturbed to significant depths.

8.2 General Results

The southern and western quadrants of the subject area were characterised as undulating slopes covered by an open woodland of scribbly gums and rough leaved ironbarks, and occasional forest red gums (**Plates 1-4**). Ground cover was composed of a dense knee-high grass, which significantly reduced visibility. Ground exposures were, however, frequent and demonstrated a texture contrast soil across much of the subject site. In many areas, only the truncated subsoil remained suggesting both land clearance and soil erosion in the past (**Plate 3**).

Despite the open woodland extending into the southern quadrant of the subject area, the site inspection indicated that extensive earthworks and/or clearing had occurred through the trees (**Plate 3**). All

exposures revealed deeply incised vehicle and heavy machinery tracks, which had significantly impacted the soil profile throughout. Further, the landfill and earthwork modifications to the north of the subject site have led to hydrological changes in parts of the woodland in the form of numerous swampy and boggy areas.

To the west, the subject area appears far less disturbed, trees are generally older in appearance and the soil profile is largely intact where visible (**Plate 4**). From a landform perspective, this area is the highest point on the site and slopes down to the East Hills railway to the north and west (**Plate 5**). However, no indication of the original tributary known to run through this area was evident. Visibility in this area was again low due to dense grass cover.

The transmission line was characterised as a long gentle slope rising from the west and dropping to Georges River in the east (**Plates 6** and **7**). Vegetation had been cleared leaving only a dense grassland beneath two large transmission lines. Exposures were readily apparent around the transmission pylons (although probably disturbed) an indicated a shallow texture contrast soil. Towards the east end of the transmission line, a vegetated tributary was present on a terrace overlooking the Georges River. While some disturbance was exhibited (most notably the old Cambridge Road alignment), it was in general undisturbed, and had good potential for Aboriginal sites/objects to occur.

The site inspections re-located one of the two previously recorded sites in the subject area, and identified four further sites. These are outlined in **Section 8.3**.

Plate 1 ***The southern quadrant of the subject area, looking west. While the area initially appeared undisturbed, several activities (such as the structures shown here) have impacted this area.***

Plate 2 ***The southern quadrant of the subject area, looking west. This area was characterised by open woodland of stringybark gum and rough leaved ironbarks. Visibility was poor.***

Plate 3 ***The southern quadrant of the subject area, looking west. While the area initially appeared undisturbed, several activities (such as the heavy machinery tracks shown here) have impacted this area.***

Plate 4 ***The western quadrant of the subject area, looking north. This area was characterised as open woodland and had only minor impacts such as the road shown here. This area forms the likely location of the proposed recycling facility.***

Plate 5 ***The western quadrant of the subject area, looking northwest. This area shows the dam evident in several of the historical photographs, and was probably part of a minor tributary running toward Georges River. The southwest railway line is also visible in the background.***

Plate 6 ***The transmission line forming the southern portion of the subject area, looking east. The transmission line shows that the subject area originally was a large gently sloping hill running up from Glenfield, and down towards Georges River.***

Plate 7 ***The transmission line forming the southern portion of the subject area, looking west.***

8.3 Aboriginal Objects/Sites

As outlined in **Section 5.2.6,** two Aboriginal sites had been previously recorded within the subject area (**Figure 20**):

- Glenfield 1 (#45-5-3531), an isolated object; and
- Glenfield ST (#45-6-2428), a scarred tree.

An additional four sites were identified during the site inspections (**Figure 20**):

- GWD 1, a scarred tree;
- GWD 2, a potential archaeological deposit;
- GWD 3, an isolated object; and
- GWD 4, an isolated object.

It is considered likely that the scarred tree identified during the site inspection (GWD 1) is the tree initially recorded by Anthony English, and later erroneously located and recorded as Glenfield ST (#45-6-2428). To avoid confusion, the two unique identifiers (GWD 1 and Glenfield ST) have been retained. Subsequent analysis (**Section 8.3.1**) has demonstrated that neither of these sites are likely to be of cultural origin.

Glenfield 1 (#45-5-3531) – Isolated Object

MGA Zone 56 306252E, 6239702N

This site has an isolated piece of heat-shattered silcrete located on an access track in the northwest quadrant of the subject site. The access track is currently being used by the Southwest Freight railway line and/or Glenfield railway station upgrades and experiences heavy vehicle traffic. While access could not be obtained (due to the construction) at time of site inspection, it is considered highly likely that this site has been destroyed through these activities.

Glenfield ST (#45-6-2428) – Scarred Tree

MGA Zone 56 306217E, 6239617N

This site has a scarred tree recorded by AMBS in 2008 based on an earlier recording of the site by Anthony English. The site is located on top of the hill in the western quadrant of the subject site, immediately west of the house in this location.

The scar appears to be on a very thin (and probably relatively young) scribbly gum. It is a long twisted scar running from the ground to about 1.5 m up the tree (**Plate 8**). There was no evidence of axe marks or tree healing. It is AHMS' opinion and that of the Aboriginal stakeholders that this was not a culturally modified tree, it is believed that Anthony English may have been referring to the site we now identify as GWD 1, rather than the tree identified here by AMBS.

This site is considered to be of natural, rather than cultural origin. See **Section 8.3.1** for further discussion.

GWD 1 – Scarred Tree

MGA Zone 56 – 306386E, 6239638N

This site has a scarred tree located some 70 m north of the house in the northwest quadrant of the subject site. The tree had the appearance of a red forest gum of some age with a girth of 320 cm (**Plates 9** and **10**). The scar was located on the western side of the tree and was 110 x 35 cm in size. The scar was oval in shape and demonstrated evidence of bark healing around the edges. However, the base of the scar was close to the ground and due to tree rot, it is unclear if the base of the scar was intact or open at the base – if the latter the potential for the scar to be of cultural origins is significantly reduced. It is recommended that an arborist investigates this tree further before formal identification of this site.

It is believed that this may be the scarred tree Anthony English originally recorded, rather than Glenfield ST as it is currently assigned.

Representatives of DLO and DACHA both raised doubts about this scarred tree being of cultural origin.

This site is considered to be of natural, rather than cultural origin. See **Section 8.3.1** for further discussion.

GWD 2 – Potential Archaeological Deposit

MGA Zone 56 – 306730E, 6239318N; 306702E, 6239190N; 307109E, 6239189N; 307084E, 6239099N

This site consisted of a large undulating terrace feature (some 400 x 100 m in size) encompassing a tributary and the edge of Georges River at the eastern end of the transmission line (**Plates 11** and **12**). This area was identified based on its proximity to Georges River and its confluence to the minor tributary, and the general lack of disturbance in this part of the subject site.

For ease of management this site has been recorded as a large rectangle, but it is acknowledged parts of this area have been impacted through the former Cambridge Avenue alignment and the transmission lines. In addition, the areas closet to Georges River could not be accessed, so their potential and/or disturbance could not be accurately determined.

GWD 3 – Isolated Object

MGA Zone 56 – 306870E, 6239382N

This site consisted of a silcrete flake located some 50 m south of the main site office of the subject area (**Plate 13**). It was located on a heavily disturbed soil profile (generally only truncated clay subsoils being present) within an open woodland not far from the main subject site entrance.

The silcrete flake was of relatively early reduction; had a faceted platform; one large dorsal scar as well as some primary cortex (suggesting an outcropping, rather than fluvial origin); distal shape; and hinged termination (**Plate 14**). Despite relatively good visibility in this location no further objects were identified.

GWD 4 – Isolated Object

MGA Zone 56 – 306780E, 6239378N

This site consisted of a broken silcrete flake in close proximity to GWD 3. It was located within a very small old stockyard some 100 m southwest of the main site office of the subject area (**Plate 15**). The area was heavily disturbed by both animals historically and more recently by heavy-vehicled tracks.

Only the distal end of the artefact was found. It was of early reduction stage; had one large dorsal scar as well as some primary cortex (suggesting an outcropping, rather than fluvial origin); parallel shape; and feathered termination (**Plate 16**).

8.3.1 Scarred Tree Investigation

Due to uncertainty regarding the antiquity and cultural origins of two scarred trees identified during the field investigations (**Sections 8.2** and **8.3**), AHMS recommended that an arborist be engaged to further investigate whether or not the scars were produced by Aboriginal traditional practices. EPS subsequently engaged Urban Tree Management (UTM) to investigate whether the scars where of cultural/human or natural origin.

UTM's assessment is presented in **Appendix 3**. In summary, the assessment indicates that both trees were likely to be between 75-100 years old, and that the scars were likely to be between 25-50 years in age. Given the cultural practise of scarring trees largely ceased in the Sydney Basin area in the 19th Century (i.e. >100 years ago), it suggests that the scars on these trees are not of Aboriginal origin (Long, 2005).

The assessment further defined the nature of the impacts required to produce the scars, which in both cases was considered a form of impact (such as a vehicle strike), as well as damage from borers and a steel cable in the case of #45-5-2428.

Subsequently, this assessment considers both Glenfield ST 1 (#45-5-2428) and GWD 1 to be of non-Aboriginal origin, and require no further consideration in this assessment. However, due to one of the trees already being listed on the OEH AHIMS database, recommendations below have been made to remove the tree from this system.

Figure 20 Map of archaeological sites within the subject area.

Plate 8 ***Glenfield ST (#45-5-2428), looking north. This scarred tree was recently recorded by AMBS in 2008, and may relate to an earlier recording by Anthony English in this general vicinity. Subsequent investigations indicate that the scar is likely to be of natural origins.***

Plate 9 ***GWD 1, a possible scarred tree, looking east. This tree was located some 50 m north of the house structure in the western quadrant of the subject site. Glenda Chalker poses for scale. Subsequent investigations indicate that the scar is likely to be of natural origins.***

Plate 10 ***GWD 1, a possible scarred tree, looking east. Subsequent investigations indicate that the scar is likely to be of natural origin***

Plate 11 ***GWD 2, a potential archaeological deposit, looking east along the transmission line. The tree-line represents part of a minor tributary that runs into the Georges River, and appears relatively undisturbed since the 1930s.***

Plate 12 ***GWD 2, a potential archaeological deposit, looking west. The creek line is shown to the left of the photograph.***

Plate 13 ***GWD 3, an isolated object (shown by the white card on the ground), looking northwest towards the maintenance sheds in the southern portion of the subject area.***

Plate 14 ***GWD 3, an isolated object – ventral surface.***

Plate 15 ***GWD 4, an isolated object (shown by the white card on the floor), looking north towards the maintenance sheds in the southern portion of the subject area.***

Plate 16 ***GWD 4, an isolated object – ventral surface.***

8.4 Summary

The study area was investigated on two different occasions, once for the preliminary assessment and once as part of the proposed recycling facility. Ultimately, the investigations included two archaeologists and six Aboriginal sites officers inspecting the entire subject area. While vegetation coverage was dense in some areas, the investigations concluded that large parts of the subject area were heavily disturbed by existing and previous land use (**Figure 19**), most notably a significant portion of the site was an active landfill, and a railway had been constructed (with extensive impacts) along most of the northern edge. South of Cambridge Avenue, a large transmission line and residential development had also resulted in localised impacts. In areas where impacts were not readily apparent (**Figure 19**), the site was characterised by a texture contrast soil, which consisted of two layers - an upper topsoil unit that will contain any cultural and archaeological material (if present), and a lower clay unit that generally pre-dates the colonisation of Australia (and is therefore archaeologically sterile). It was found that frequently, the upper unit was truncated or absent, and therefore the potential for cultural materials was considered very low - nil. This included heavily wooded areas that were initially thought to be undisturbed, but on inspection were found to be relatively recent re-growth (confirmed by the Arborist's report (**Appendix 3**)) and similarly often exhibited truncated soil profiles.

Overall, six archaeological and possible archaeological sites were identified, composed of two 'scarred trees' (see below), three isolated Aboriginal objects, and one potential archaeological deposit (**Figure 20**). It was considered that no other areas exhibited or had the potential to contain cultural or archaeological materials. Of these sites, the two scarred trees were subsequently identified as natural features, leaving four sites. All findings were agreed with by the Aboriginal stakeholders in their comments on the report (see **Appendix 2**).

9 SIGNIFICANCE ASSESSMENT

9.1 General

The heritage significance of Aboriginal archaeological sites can be assessed using the four criteria outlined in the Burra Charter; aesthetic, historic, scientific, and social or spiritual (Australia ICOMOS, 1999).

9.2 Social or Spiritual Significance

This criterion concerns the relationship and importance of sites to the contemporary Aboriginal community. Aspects of cultural significance include people's traditional and contemporary links with a given site or landscape as well as an overall concern by Aboriginal people for sites and their continued protection. Aboriginal cultural values may partially reflect or follow on from archaeological values, historic values, aesthetic values or be tied to values associated with the natural environment - all elements that are discussed above - it is of fundamental importance that they be expressed directly by representatives of the Aboriginal community.

Unmodified natural features in the landscape can signify sacred sites or places of significance. As such, they are archaeologically invisible and can only be identified with the aid of Aboriginal interpretation. If such sites are known, they hold particular cultural significance to contemporary Aboriginal people. Furthermore, sites of significance are not restricted to the period prior to contact with Europeans. Often events related to the contact period, and at times to the period since European settlement, may be important to the local Aboriginal communities. If these events relate to a specific place in the landscape, then that place (i.e. the site) may become sacred or highly significant to the local Aboriginal communities.

Responses from the Aboriginal community following the distribution of a draft version of this report indicated that the subject area would have been important to Darug people due to the proximity of the Georges River (**Appendix 2**). However, they acknowledge that the recent extraction activities have removed any material evidence of such activities. No specific cultural values were assigned to any of the sites identified through this project.

9.3 Scientific Significance

9.3.1 General

The structuring of the process used to assess scientific significance has been outlined by Bowdler (e.g. 1981), and includes the consideration of a number of related issues: research potential, or the ability to address timely and significant research questions; the rareness and/or representativeness of a site; and its integrity.

For the purpose of this assessment, four Aboriginal sites were considered: Glenfield 1, and GWD 2-4 inclusive. Neither of the scarred trees, which proved to be natural are considered.

9.3.2 Research Potential

Research potential is defined as 'the ability to address timely and significant research questions'. The issue of 'timeliness' is critical and surrounds much of the discussion of the mutability of significance that has followed the development of archaeological significance assessment since it essentially began in Australia in the early 1980s (e.g. Bowdler 1981, Sullivan and Bowdler 1984, Smith 1996, Brown 2008, Brown 2011). Essentially, the research questions of today are not the same ones that would have been asked one or ten years ago or which are likely to be asked in one or ten years from now. Critically, for example, there are far fewer 'big' questions that can be asked of Cumberland sub-bioregion open sites and the typology or distribution of the artefacts of which they comprise following some three decades of development-related survey and excavation. Meanwhile, important questions about technological change through the last 5,000 years remain open (because very few sites have yet been investigated (and dated) that are deep, undisturbed and stratified); as do questions about the earliest settlement of the region sometime between 35,000 and 40,000 years ago (because stratified sites of this antiquity only occur in some very limited geomorphic contexts).

It has regularly been commented that the assessment of research potential undertaken by archaeologists (i.e. excluding that provided by the Aboriginal community) can often have the illusion of objectivity that is not matched by greater scrutiny (e.g. Smith 1996, Godwin 2011). Questions are asked: Can the site contribute knowledge that no other resource or site can and/or is the knowledge (unique or otherwise) that a site can contribute relevant to general or specific questions about Aboriginal (pre)history? (paraphrased and adapted to an Aboriginal context from Heritage Branch 2009:8). But while these are questions that can be answered with yes or no or scores from one to ten, Smith has made the point that 'a cultural resource does not have value, but is given value through the process of significance assessment' (1996:67). It is therefore important who gives that value; and then regardless of who that is, that it is well justified and provided sufficient context by the level of investigation and comparative analysis (or other clear understanding of regional archaeology).

In relation to the subject area, only GWD 2 on the edge of Georges River is considered likely to contain material evidence that could be used to address important research questions. Sites in this location are typically large in size and reflect multiple phases of occupation, and have the potential to further understanding of the occupation and use of one of the larger rivers in the region by Aboriginal people. The possibility of the presence of stratigraphic deposits, and hence the potential to derive chronological information from the evidence, is considered likely.

9.3.3 Rareness and Representativeness

The comparative rarity of a site is a consideration in assessing scientific significance. A certain site type may be 'one of a kind' in one area, but very common in another. Artefacts of a particular type may be common in one area, but outside the known distribution in another. The area set when assessing rareness can be considered at various scales - anything from the limits of the subject area itself to the entire country. This geographic extent, when then populated with the known and unknown sites within it can be considered as the 'datum' against which any particular site can be measured (see Godwin 2011 and subsequent comments). An appropriate middle ground, in the greater Sydney region and for the type of heritage management being addressed here, has been proposed to be the subregions mapped within the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Cresswell 1995; see Brown 2010a for discussion in a heritage management context). Within IBRA mapping, the subject area is within the Cumberland sub-bioregion.

Within the Cumberland sub-bioregion, 'rareness' is an uncommon contributor to archaeological significance for open lithic sites; it being an area where such sites (with similar artefact types and raw materials) are widespread to the point of being almost ubiquitous. Only a few particular types of open

lithic sites (such as deep, undisturbed and well-stratified ones) could be considered rare in this context.

In one definition provided by Bowdler, representativeness 'is the degree to which sites in the investigated (perhaps threatened) area are representative of sites known elsewhere and where they might be better protected' (1981:128). In this sense, the more representative that a site is (i.e. the more it is of a type well represented elsewhere), the less it would generally be considered to be a matter of conservation priority. Rareness and representativeness are therefore in most cases inseparable and are to some extent simply different ways of looking at the same thing; 'rareness' being slightly more quantitative compared to a more qualitative approach with 'representativeness'.

Within current development consent processes, the assessment of rareness and representatives is perhaps the core outcome of Aboriginal cultural heritage assessment; and it can be posited as a simple question: 'is this a site that can be lost for the sake of development or is it one that must be conserved?'. It is perhaps only with the addition of other significance criteria that we can introduce the nuances of more detailed consideration of the options of active conservation planning, avoidance of harm, minimisation of harm, mitigation of harm or unrestricted permission to harm.

None of the previously recorded sites within the subject area can be considered rare, since they are primarily disturbed isolated finds; these site types are well represented across the Cumberland Plain. However, GWD 2 on the bank of Georges River has the potential to contain extensive and/or old cultural materials - both are features which are less common in the region, although found elsewhere along the creek.

9.3.4 Site Integrity and Disturbance

The integrity of a site is also a consideration in determining scientific significance. While disturbance of a topsoil deposit containing artefacts does not entirely diminish research value, it may limit the types of questions that may be addressed. A heavily cultivated paddock may be unsuited to addressing research questions of small-scale site structure, but it may still be suitable for answering more general questions of implement distribution in a region and raw material logistics.

While site integrity/disturbance is rarely formally included separately within the framework of heritage significance assessment, it arguably should be because it affects all other facets of significance in different ways. For example, if a reasonably defined open artefact site has been partially destroyed, the effect on representatives might be high when other comparable sites remain intact; but research potential may remain unaffected for the purposes of addressing regional implement and raw material distribution.

In relation to the subject area, few of the identified sites, or areas adjacent to Georges River are without disturbance from historical development and land use. Several of the sites could not be re-located due to the level of existing disturbance, and a number of them must be considered to have low integrity. However, the potential for undisturbed sub-surface deposits at GWD 2 is considered moderate.

9.4 Aesthetic Significance

This criterion refers to aspects of sensory perception. The guidelines to the Burra Charter note that assessment may include consideration of the form, scale, colour, texture and material of the item or place, as well as sounds and smells. With regard to pre-contact Aboriginal cultural heritage sites, the

placement within the landscape would be considered under this criterion. Individual artefacts, sites and site features may also have aesthetic significance.

Many of the Aboriginal objects/sites within the subject area are located in a context without remarkable landscape setting, and cannot be considered to retain aesthetic values. GWD 2, however, is situated on the banks of the Georges River - one of the few permanent and large creeks in this region - its proximity and location contribute to the understanding of the Aboriginal cultural heritage significance of the subject area, and can be considered to retain aesthetic values.

9.5 Historic Significance

The guidelines to the Burra Charter include the following discussion of historic significance:

> *A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.*

In relation to Aboriginal cultural heritage, many post-contact places and sites would have historic value. Pre-contact places and items may also be significant according to this criterion, although the association with historic figures, events, phases or activities may be more difficult to establish. Places of historic significance may include sacred or ceremonial sites, and archaeological sites with evidence of technological developments.

The assessment of the subject area, and discussions with the Registered Aboriginal Parties did not result in the identification of any historic values for the subject area.

9.6 Conclusion

The study area has been subject to widespread disturbance, through clearing of the vegetation, creation and use of vehicle tracks, and the grazing of stock. Although this disturbance does not appear to have included deep excavation over any large area, it has resulted in frequent erosion.

Within the subject area, four Aboriginal sites were identified three isolated objects (Glenfield 1, GWD 3 and 4), and a potential archaeological deposit (GWD 2).

Glenfield 1 was identified as an isolated object, which could not be relocated as part of this assessment. While the object indicates the historical presence of Aboriginal people in the subject area in the past, it can provide little further information and is considered of low significance.

In relation to GWD 2 - a PAD on the banks of Georges River - it is considered likely to contain material evidence that could be used to address important research questions. Sites in this type of location are typically large in size and reflect multiple phases of occupation, and have the potential to further understanding of the occupation and use of one of the larger rivers in the region by Aboriginal people. The possibility of the presence of stratigraphic deposits, and hence the potential to derive chronological information from the evidence, is considered moderate.

The presence of the isolated objects, GWD 3 and GWD 4, in this area indicates that the historical disturbance has not resulted in the complete removal of archaeological evidence of the past

Aboriginal occupation of the area. There may be further surface artefacts present within the subject area. However, the archaeological context of GWD 3 and GWD 4, and any further artefacts present in this area, has been destroyed, meaning that the object has little research potential.

To assess each site individually against the above criteria, a series of questions and answers have been used to explore the site's significance, before making an overall ranking (Table 14). These questions have been adapted for application in an Aboriginal cultural heritage context from the NSW Heritage Branch Department of Planning (2009) *Assessing for Significance for Historical Archaeological Sites and 'Relics'*. These were prepared in association with legislative reform in 2009 leading to greater consideration of significance values and Burra Charter principles to archaeological sites, much as also occurred with changes to Aboriginal heritage management codes and guidelines in 2010. The questions are as follows:

a) Cultural/Social values: Does the site have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons? (noting that with Aboriginal heritage, the cultural group involved is pre-identified within the Aboriginal community through the community consultation process).

b) Historic values: Is the site important to the cultural or natural history of the local area and/or region and/or state?

c) Aesthetic values: Is the site important in demonstrating aesthetic characteristics in the local area and/or region and/or state?

d) Scientific values: Does the site have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state?

e) Research potential: Does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?

f) Representativeness: How much variability (outside and/or inside the site) exists, what is already conserved, how much connectivity is there?

g) Rarity: Is the site important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?

h) Education potential: Does the site contain teaching sites or sites that might have teaching potential?

Table 2: ***Scientific significance assessment of known sites and areas of potential in the subject area, based on criteria in the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW.***

Site	AHIMS number	Site Type	Significance Values									Overall Site Significance[1]
			Cultural/social	Historic	Aesthetic	Scientific	Research Potential	Representativeness	Rarity	Integrity	Education potential	
Glenfield 1	45-5-3531	Isolated Object	None provided	No	No	No	No	High	No	Poor	No	Low
GWD 2	45-5-0312	PAD	Yes	No	Some	Yes	Yes	High	Some	Moderate	Some	Moderate
GWD 3	45-5-0313	Isolated Object	None provided	No	No	No	No	High	No	Poor	No	Low
GWD 4	45-5-0360	Isolated Object	None provided	No	No	No	No	High	No	Poor	No	Low

[1] This field provides the overall significance of the site based on the answers to the specific significance criterions outlined elsewhere in the table.

10 CONCLUSIONS & RECOMMENDATIONS

10.1 The Archaeological Resource

The subject area is located on the banks of Georges River. Historically, it would have been a low gentle hill sloping down towards the river, and encompassed two first order tributaries. Since the 1970s, the subject area has been used for sand extraction and landfill, and these activities have significantly impacted several areas of the site.

Based on regional data, archaeological deposits in this area are likely to be constrained to artefact scatters, isolated finds, scarred trees and/or potential archaeological deposits. When overlaying archaeological potential with areas of known disturbance, only two parts of the subject area are considered to have potential for the presence of Aboriginal objects/sites: an area of unmodified woodland in the western quadrant of the subject area; and the alluvial terrace on the eastern edge of the transmission line.

A review of the archaeological record and a site inspection has confirmed the contextual assumptions. The sites identified within the subject area are as follows (see **Figure 20**):

- Glenfield 1 (#45-5-3531), an isolated object. It is considered probable that this site has been destroyed since the registration was lodged.
- GWD 2, a potential archaeological deposit.
- GWD 3, an isolated object.
- GWD 4, an isolated object.

Two further sites were initially identified, but have subsequently been re-classified as of natural origin (**Section 8.3.1**). These were:

- Glenfield ST (#45-6-2428), a scarred tree.
- GWD 1, a scarred tree.

The footprint of the proposed development consists of a disturbed area of low archaeological potential, but does include the sites GWD 3 and GWD 4.

10.2 Subject Site Management

The findings of this assessment indicate that there are no reasons to object to the proposed rezoning on Aboriginal heritage grounds. This is because the level of impact on potential Aboriginal objects/sites would be negligible at re-zoning stage. GWD 2, a moderately significant PAD, is proposed to be re-zoned *RE1 Public Recreation, SP2 Road and Infrastructure (Car Park)* and *SP2 Future Transport Corridor* by Campbelltown City Council. These zonings would not result in significantly deep (if any) impacts to the under-lying deposits. Further investigation of GWD 2 may be required to firmly identify its scientific and cultural values as part of any development application for the GWD 2 area. Therefore, while additional characterisation of the deposit is desirable, the level of

impact from the re-zoning would be negligible and such investigation could occur at the development stage.

Should potential impacts to GWD 3 and 4, an Aboriginal Heritage Impact Permit and associated documentation would need to be lodged with Office of Environment & Heritage for consideration prior to any development. No further action is considered necessary for Glenfield ST1 and GWD 1, since both sites were identified as scarred trees, but subsequently determined to be non-cultural.

Responses from the RAPs provided agreement and support of the findings and recommendations outlined here. The only additional recommendation made by the RAPs was the inclusion of signage on the Aboriginal history of the region following the completion of the development (**Appendix 2**). This recommendation has been considered as part of the report's recommendations (**Section 10.3**).

10.3 Conclusions and Recommendations

- If the boundaries of the subject area are revised to include areas not addressed in the assessment, assessment of these additional areas should be undertaken in order to manage the potential Aboriginal heritage impact.

- Kennett Enterprises should advise all relevant personnel and contractors involved in activities within the subject area of the relevant heritage issues and legislative requirements, and the recommendations of the current assessment.

- In the event that previously unidentified Aboriginal objects, sites or places (or potential Aboriginal objects, sites or places) are discovered within the subject area, all work in the vicinity of the find should cease, and Kennett Enterprises should determine the subsequent course of action in consultation with a heritage professional, the Registered Aboriginal Parties and the relevant State government agency.

- If human skeletal material less than 100 years old is discovered, the Coroners Act 2009 requires that all works should cease and the NSW Police and the NSW Coroner's Office should be contacted. Traditional Aboriginal burials (older than 100 years) are protected under the National Parks and Wildlife Act 1974 and should not be disturbed. Therefore when skeletal remains are found and are suspected to be an Aboriginal burial site, an appropriately skilled archaeologist or physical anthropologist should be contacted to determine if the remains are Aboriginal objects. Should skeletal remains prove to be archaeological the RAPs should be notified. Notification should also be made to the Commonwealth Minister for the Environment, under the provisions of the Aboriginal and Torres Strait Islander Heritage Protection Act 1984.

- Based on the findings of this study, there are no Aboriginal heritage issues that indicate that the re-zoning of the subject site from rural to industrial should not proceed;

- Aboriginal Heritage Information Management System (AHIMS) Site cards for the two isolated objects, GWD 3 and GWD 4, should be completed and lodged with the AHIMS registrar. [Completed]

- An AHIMS site card for the potential archaeological deposit GWD 2 should be completed and lodged with the AHIMS registrar. [Completed]

- Following advice from an arborist, neither Glenfield ST 1 (#45-6-2428) nor GWD 1 are considered scarred trees of cultural origin. A modified AHIMS site card reflecting these findings and explaining the outcomes of this study should be lodged with the AHIMS registrar; specific request should be made for the re-classification of Glenfield ST 1 (#45-6-2428) to the category 'not a site' in the AHIMS system. [Completed]

- It is recommended that prior to any impact from proposed development, further assessment and characterisation is undertaken of the identified Aboriginal objects/sites. Should they prove to be Aboriginal objects/sites as defined by the *National Parks and Wildlife Act 1974*, appropriate assessments and permits under this Act would be required prior to their disturbance

- In accordance with Aboriginal community responses, consideration should be given to developing signage on the Aboriginal history of the subject area following the completion of the development.

- A copy of the final version of the assessment should be provided to each of the registered Aboriginal parties, listed above. [Completed]

- A copy of the final assessment should be lodged with the AHIMS registrar in accordance with relevant guidelines. [Completed]

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APPENDIX 1: AHIMS DATA

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : Glenfield2

Client Service ID : 69786

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-2537	HPR-OS-1	AGD	56	303150	6243640	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Robynne Mills					**Permits**	1431	
45-5-2538	HPR-ST-1	AGD	56	306810	6243650	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	98443
	Contact	**Recorders**	Robynne Mills					**Permits**		
45-5-2495	MFH 2	AGD	56	304300	6238300	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-5-2479	IF 1 (isolated find)	AGD	56	303680	6241600	Open site	Valid	Artefact : -	Isolated Find	98369,98370,98371,98443,98739
	Contact	**Recorders**	Elizabeth White					**Permits**		
45-5-2481	Maxwells Creek 11 (MC11)	AGD	56	303720	6241600	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Elizabeth White					**Permits**	1398	
45-5-2482	Maxwells Creek 10 (MC10)	AGD	56	303490	6241050	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Elizabeth White					**Permits**	1564	
45-5-2483	Maxwells Creek 9 (MC9)	AGD	56	303050	6241080	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Elizabeth White					**Permits**		
45-5-2469	IF1	AGD	56	303830	6241020	Open site	Valid	Artefact : -	Isolated Find	98369,98370,98371,98443
	Contact	**Recorders**	Helen Brayshaw					**Permits**	1398	
45-5-2470	IF2	AGD	56	303370	6242320	Open site	Valid	Artefact : -	Isolated Find	98369,98370,98371,98443,98739
	Contact	**Recorders**	Helen Brayshaw					**Permits**		
45-5-2471	IF3	AGD	56	302590	6243630	Open site	Valid	Artefact : -	Isolated Find	98369,98370,98371,98443,98739
	Contact	**Recorders**	Helen Brayshaw					**Permits**	1398,1564	
45-4-0936	Crossroad 1	AGD	56	303780	6240070	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Kerry Navin,Mr.Kelvin Officer					**Permits**	987	
45-4-0937	Crossroad 2	AGD	56	303750	6240070	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Kerry Navin,Mr.Kelvin Officer					**Permits**	986	
45-5-2455	DD1	AGD	56	302700	6238890	Open site	Valid	Artefact : -	Open Camp Site	98739

Report generated by AHIMS Web Service on 11/05/2012 for Oliver Brown for the following area at Datum :GDA, Zone : 56, Eastings : 302000 - 310000, Northings : 6236000 - 6244000 with a Buffer of 0 meters.Additional Info : GIS shapefile, zone 56 GDA94 please. Number of Aboriginal sites and Aboriginal objects found is 96

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : Glenfield2

Client Service ID : 69786

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-5-2456	DD 2	AGD	56	302200	6237550	Open site	Valid	Artefact : -	Open Camp Site	98739
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-5-2457	DD 3	AGD	56	302800	6238050	Open site	Valid	Artefact : 3	Open Camp Site	98739,102184
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists,Australian Museum Business Services (AMB					**Permits**		
45-5-2458	DD 4	AGD	56	302790	6238470	Open site	Valid	Artefact : 2	Open Camp Site	98739,102184
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists,Australian Museum Business Services (AMB					**Permits**		
52-2-0086	Long Point;Matthews No.1 Shelter;	AGD	56	308300	6237700	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Margrit Koettig					**Permits**		
45-5-0890	WG3 (Wattle Grove)	AGD	56	309100	6240030	Open site	Valid	Artefact : -	Open Camp Site	2474
	Contact	**Recorders**	Philip Boot					**Permits**	465	
45-5-0891	WG2 (Wattle Grove)	AGD	56	309020	6239950	Open site	Valid	Artefact : -	Open Camp Site	2474
	Contact	**Recorders**	Philip Boot					**Permits**	465	
45-5-0892	WG1 (Wattle Grove)	AGD	56	309070	6239950	Open site	Valid	Artefact : -	Open Camp Site	2474
	Contact	**Recorders**	Philip Boot					**Permits**	465	
45-5-2301	P-CP1	AGD	56	303690	6241790	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Helen Brayshaw					**Permits**		
45-5-2302	GP-CP2;	AGD	56	303750	6241950	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443
	Contact	**Recorders**	Helen Brayshaw					**Permits**	850	
45-5-2303	P-CP3	AGD	56	303400	6242200	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	**Recorders**	Helen Brayshaw					**Permits**		
45-5-2319	HPC 1;	AGD	56	301900	6243800	Open site	Valid	Artefact : -	Isolated Find	3374,3529,98369,98370,98371,98443,98739
	Contact	**Recorders**	Mr.Neville Baker					**Permits**	846,1053	
45-5-2320	HPC 2; HPR1	AGD	56	301950	6243740	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -	Open Camp Site	3374,98369,98370,98371,98443,98739
	Contact	**Recorders**	Mr.Neville Baker					**Permits**	846,2897,3007	
45-5-0844	Prestons 1;	AGD	56	303570	6243200	Open site	Valid	Artefact : -	Open Camp Site	2165,98369,98370,98371,98443,98739

Report generated by AHIMS Web Service on 11/05/2012 for Oliver Brown for the following area at Datum :GDA, Zone : 56, Eastings : 302000 - 310000, Northings : 6236000 - 6244000 with a Buffer of 0 meters.Additional Info : GIS shapefile, zone 56 GDA94 please. Number of Aboriginal sites and Aboriginal objects found is 96

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : Glenfield2

Client Service ID : 69786

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Kerry Navin					**Permits**	311	
45-6-2428	Glenfield S.T.	AGD	56	306200	6239600	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	**Recorders**	Anthony English					**Permits**		
45-5-0123	George's River;	AGD	56	307040	6236964	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	R Etheridge					**Permits**		
45-5-0124	Harris Creek;	AGD	56	307040	6236964	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	B Mclean					**Permits**		
45-5-2376	P-CP10	AGD	56	303640	6241560	Open site	Valid	Artefact : -	Open Camp Site	3726,98369,98370,98371,98443,98739
	Contact	**Recorders**	Helen Brayshaw,Elizabeth Rich					**Permits**	1564	
45-5-2377	P-CP11	AGD	56	302460	6243550	Open site	Valid	Artefact : -	Open Camp Site	3726,98369,98370,98371,98443,98739
	Contact	**Recorders**	Helen Brayshaw,Elizabeth Rich					**Permits**		
45-5-0720	Kiawaka 3	AGD	56	305980	6240600	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1360
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	264	
45-5-0721	Kiawaka 4	AGD	56	306000	6240660	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1360
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-5-0722	Kiawaka 5	AGD	56	306300	6240340	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1360
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	2521	
45-5-0723	Kiawaka 2	AGD	56	306250	6240150	Open site	Valid	Artefact : -	Open Camp Site	1360
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-5-0724	Kiawaka 1	AGD	56	305950	6240270	Open site	Valid	Artefact : -	Open Camp Site	1360
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		

Report generated by AHIMS Web Service on 11/05/2012 for Oliver Brown for the following area at Datum :GDA, Zone : 56, Eastings : 302000 - 310000, Northings : 6236000 - 6244000 with a Buffer of 0 meters.Additional Info : GIS shapefile, zone 56 GDA94 please. Number of Aboriginal sites and Aboriginal objects found is 96

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : Glenfield2

Client Service ID : 69786

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-2-2298	HPC2;	AGD	56	301950	6243740	Open site	Valid	Artefact : -	Open Camp Site	3374,98369,98370,98371,98443,98739
	Contact	**Recorders**	Mr.Neville Baker					**Permits**		
45-2-2299	HPC1	AGD	56	301900	6243800	Open site	Valid	Artefact : -	Isolated Find	3374,98369,98370,98371,98443,98739
	Contact	**Recorders**	Mr.Neville Baker					**Permits**	1316	
45-5-0833	Hoxton Park 2;	AGD	56	302710	6243720	Open site	Valid	Artefact : -	Open Camp Site	2118,98369,98370,98371,98443,98739
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-5-0775	CC-1 (Cabramatta Creek)	AGD	56	302560	6243250	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0776	CC-2 (Cabramatta Creek)	AGD	56	301990	6243030	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0778	MC-1 (Maxwells Creek)	AGD	56	304040	6242410	Open site	Valid	Artefact : -	Open Camp Site	1727,97544
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**	1025	
45-5-0779	MC-2 (Maxwells Creek)	AGD	56	303870	6242530	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0780	MC-3 (Maxwells Creek)	AGD	56	303350	6239250	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0781	MC-4 (Maxwells Creek)	AGD	56	303400	6239350	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0782	MC-5 (Maxwells Creek)	AGD	56	303530	6239640	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		

Report generated by AHIMS Web Service on 11/05/2012 for Oliver Brown for the following area at Datum :GDA, Zone : 56, Eastings : 302000 - 310000, Northings : 6236000 - 6244000 with a Buffer of 0 meters.Additional Info : GIS shapefile, zone 56 GDA94 please. Number of Aboriginal sites and Aboriginal objects found is 96

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-0783	MC-6;	AGD	56	303400	6239550	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0784	MC-7;	AGD	56	302900	6239240	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0785	MC-8;	AGD	56	303710	6240550	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0788	EP-1;	AGD	56	302420	6240300	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0789	EP-2;	AGD	56	302400	6239850	Open site	Valid	Artefact : -	Open Camp Site	1727,98369,98370,98371,98443,98739
	Contact	**Recorders**	Alice Gorman,Laura-Jane Smith					**Permits**		
45-5-0001	Macquarie Fields;Three Hand Alcove;	AGD	56	306685	6236409	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1976
	Contact	**Recorders**	ASRSYS					**Permits**		
45-5-2725	PAD-OS-1	AGD	56	303720	6241200	Open site	Valid	Artefact : -		98369,98370,98371,98443,98739
	Contact	**Recorders**	Robynne Mills					**Permits**	1396	
45-5-2744	MLE1	AGD	56	303500	6238550	Open site	Valid	Artefact : -		98739
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**	1989	
45-5-2800	MC9	AGD	56	303760	6241880	Open site	Valid	Art (Pigment or Engraved) : -		98369,98370,98371,98443,98739
	Contact	**Recorders**	Mr.Neville Baker					**Permits**		
45-5-2709	P-CP16	AGD	56	303900	6241890	Open site	Valid	Artefact : -		3726,98369,98370,98371,98443,98739
	Contact	**Recorders**	Helen Brayshaw,Elizabeth White					**Permits**	1637	
45-5-2761	P-CP15	AGD	56	303750	6241690	Open site	Valid	Artefact : -		3726,98369,98370,98371,98443,98739

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Helen Brayshaw,Elizabeth White					Permits	1398	
45-5-2853	PAD 6 WSO	AGD	56	303510	6240920	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Helen Brayshaw					Permits	1638	
45-5-2883	MB.1	AGD	56	308700	6241700	Open site	Valid	Artefact : -		
	Contact	Recorders	Mary Dallas Consulting Archaeologists					Permits		
45-5-2875	PAD 6 Open Campsite	AGD	56	303610	6240840	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits	1737	
45-5-2919	H667	AGD	56	306990	6237370	Open site	Valid	Artefact : -		
	Contact	Recorders						Permits		
45-5-2934	H414	AGD	56	307600	6237325	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-2935	H413	AGD	56	308500	6235975	Open site	Valid	Grinding Groove : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
52-2-2324	H304	AGD	56	307050	6235850	Open site	Valid	Art (Pigment or Engraved) : -, Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-2931	H581	AGD	56	306850	6237490	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-2957	799	AGD	56	308500	6236240	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders						Permits		
45-5-2963	Site H928	AGD	56	306840	6237510	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Bobbie Oakley					Permits		
45-5-2968	Site H1025	AGD	56	307280	6237500	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-2946	H363	AGD	56	307050	6237560	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 11/05/2012 for Oliver Brown for the following area at Datum :GDA, Zone : 56, Eastings : 302000 - 310000, Northings : 6236000 - 6244000 with a Buffer of 0 meters.Additional Info : GIS shapefile, zone 56 GDA94 please. Number of Aboriginal sites and Aboriginal objects found is 96

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : Glenfield2

Client Service ID : 69786

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders						Permits		
45-5-2947	H362	AGD	56	307130	6238300	Open site	Valid	Artefact : -		
	Contact	Recorders						Permits		
45-5-2914	H820	AGD	56	308510	6236650	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Kelvin Officer,Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-2964	Site H970	AGD	56	307130	6236550	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Bobbie Oakley					Permits		
45-5-2969	Site H1029	AGD	56	308200	6236700	Open site	Valid	Grinding Groove : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-3187	Nineteenth Ave Scarred Tree (NA1)	AGD	56	302093	6243215	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact T Russell	Recorders	Ms.Jillian Comber					Permits		
45-5-2480	Maxwells Creek 12 (MC12)	AGD	56	303700	6241700	Open site	Valid	Artefact : -	Open Camp Site	98369,98370,98371,98443,98739
	Contact	Recorders	Elizabeth White					Permits		
45-5-0889	WG 4 (Wattle Grove)	AGD	56	309130	6240170	Open site	Valid	Artefact : -	Open Camp Site	2474
	Contact	Recorders	Philip Boot					Permits	465	
45-5-0794	Holsworthy (H) 2;	AGD	56	309550	6240200	Open site	Valid	Artefact : -	Open Camp Site	1934
	Contact	Recorders	Philip Boot					Permits	456	
45-5-3529	EPCS4	GDA	56	302178	6239148	Open site	Valid	Artefact : 2		
	Contact	Recorders	Australian Museum Business Services (AMBS)					Permits		
45-5-3531	Glenfield 1	GDA	56	306252	6239702	Open site	Valid	Artefact : 1		
	Contact	Recorders	Australian Museum Business Services (AMBS)					Permits		
45-5-3535	SWRL Site 5	GDA	56	302757	6239032	Open site	Valid	Stone Arrangement : 5		
	Contact	Recorders	Australian Museum Business Services (AMBS)					Permits		
45-5-3439	CC4 Hoxton Park	AGD	56	301900	6243150	Open site	Valid	Artefact : 7		
	Contact	Recorders	Mary Dallas Consulting Archaeologists					Permits	2981	
45-5-0795	Holsworthy (H) 1;	AGD	56	309300	6240120	Open site	Valid	Artefact : -	Open Camp Site	1934
	Contact	Recorders	Philip Boot					Permits	456	
45-5-3639	BC1 (Liverpool)	GDA	56	305214	6237770	Open site	Valid	Artefact : 1		101368
	Contact	Recorders	Mr.Oliver Brown					Permits		

Report generated by AHIMS Web Service on 11/05/2012 for Oliver Brown for the following area at Datum :GDA, Zone : 56, Eastings : 302000 - 310000, Northings : 6236000 - 6244000 with a Buffer of 0 meters.Additional Info : GIS shapefile, zone 56 GDA94 please. Number of Aboriginal sites and Aboriginal objects found is 96

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : Glenfield2

Client Service ID : 69786

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-3629	Collingwood Park (CW 1)	GDA	56	307600	6243160	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		101316
	Contact	**Recorders**	Mr.Oliver Brown					**Permits**	3184	
45-5-3709	KB1 (Liverpool)	GDA	56	302939	6241996	Open site	Valid	Artefact : 1		99115
	Contact	**Recorders**	Michael Therin					**Permits**	3194	
45-5-3710	KB2 (Liverpool)	GDA	56	302386	6242062	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Michael Therin					**Permits**	3194	
45-5-3908	EPCS 1	AGD	56	302179	6240173	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Megan Mebberson					**Permits**		
45-5-3909	EPCS 3	AGD	56	302385	6239089	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Megan Mebberson					**Permits**		
45-5-3913	EPCS 12	AGD	56	302739	6238458	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Megan Mebberson					**Permits**		
45-5-3914	EPCS 13	AGD	56	302500	6238480	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	Megan Mebberson					**Permits**		
45-5-3990	SWRL Site 14	GDA	56	302406	6239226	Open site	Valid	Artefact : 4		102198,102199
	Contact	**Recorders**	Australian Museum Business Services (AMBS)					**Permits**		
37-2-3969	EPCS 2	GDA	56	302420	6240380	Open site	Valid	Artefact : 9		102184
	Contact	**Recorders**	Australian Museum Business Services (AMBS),Ms.Ngaire Richards					**Permits**		
45-5-3984	EPSW1	GDA	56	302803	6238254	Open site	Valid	Artefact : 1		102184
	Contact	**Recorders**	Australian Museum Business Services (AMBS),Ms.Ngaire Richards					**Permits**		
45-5-3987	EPSW4	GDA	56	302124	6239327	Open site	Valid	Artefact : 2		102184
	Contact	**Recorders**	Australian Museum Business Services (AMBS),Ms.Ngaire Richards					**Permits**		
45-5-3988	EPSW5	GDA	56	302361	6238116	Open site	Valid	Artefact : 29		102184
	Contact	**Recorders**	Australian Museum Business Services (AMBS),Ms.Ngaire Richards					**Permits**		
45-5-3989	SW2	GDA	56	302124	6239332	Open site	Valid	Artefact : 1		102184
	Contact	**Recorders**	Australian Museum Business Services (AMBS),Ms.Ngaire Richards					**Permits**		

Report generated by AHIMS Web Service on 11/05/2012 for Oliver Brown for the following area at Datum :GDA, Zone : 56, Eastings : 302000 - 310000, Northings : 6236000 - 6244000 with a Buffer of 0 meters.Additional Info : GIS shapefile, zone 56 GDA94 please. Number of Aboriginal sites and Aboriginal objects found is 96

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Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION

Site name	Glenfield 1	**NPWS Site Number**	45-5-3531
Owner/manager			
Owner Address			

LOCATION

Location	Lot 9 DP833516						
How to get to the site	Coming from Sydney, travel west on the Hume Highway, bear left at Campbelltown Road, turn left at Glenfield Road, turn right at the roundabout, turn left at the next roundabout, then turn right onto an access road next to the railway line. Walk northeast along the road for approximately 300m. The site is in an area of exposure on the left side of the road, approximately 15m west of a 20km/hr road sign.						
1:250,000 map name					**NPWS map code**		
AMG Zone	56	**AMG Easting**	306252		**AMG Northing**	6239702	
Method for grid reference	Hand-held GPS	**Map scale (if method = map)**	1:25,000	**Map name**			
NPWS District					**NPWS Zone**	Sydney Zone	
Portion no.					**Parish**		

SITE DESCRIPTION

Site type(s)	Isolated find	**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	This site is located c. 1 km west of the Georges River, within Lot 9 DP833516. The current railway line is present c. 50 m to the north of the site. The exposure is located beside an access road to the sand mine, c. 15 m west of a 20 km/hour sign. The land slopes slightly down to the south, and to the east after the speed sign. A series of houses is present on the southern side of the access road, but are not visible from the site because the southern side of the road has an embankment. The site comprises one piece of heat-shattered red silcrete. Ground surface visibility within the exposure was around 95%.		

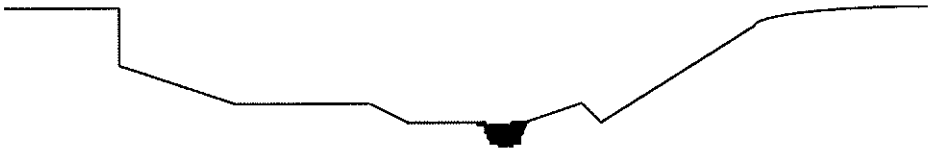
Version: June 1998 | Data entered by: Eva Day | Date entered: 12/8/2008

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

SITE ENVIRONMENT

Land form	Flat	**Aspect**		**Slope**	
Mark position of the site					
Local rock type		**Land use/effect**			
Distance from drinking water	200m	**Source**	Glenfield Creek		
Resource zone (eg. estuarine, river, forest)		**Vegetation**			
Edible plants		**Faunal resources** (include shellfish)			
Other exploitable resources (eg. ochre)					
Are there other sites in the locality	Yes	**Are they in the Sites Register**	Yes	**Other site types include**	Stone artefact scatters, scarred trees

SITE MANAGEMENT

Site condition	Disturbed		
Management recommendations	Site should not be impacted by the proposed upgrade works to the railway line, however it is receommended that temporary fencing be erected around the site during construction works, so as to prevent accidental impact (eg from vehicle access).		
Have artefacts been removed from site	No	**When**	
By whom		**Deposited at**	
Consent applied for	☐	**Consent issued**	☐
Date of issue		**Consent number**	

SITE INSPECTION AND RECORDING

Reason for investigation	Aboriginal heritage assessment for proposed upgrade of Glenfield railway station		
Were local Aborigines contacted or present for the recording	☐ Not contacted ☒ Contacted and present ☐ Contacted but not present	**Names and addresses**	Cliff Foley Dharawal Local Aboriginal Land Council PO Box 20 Buxton NSW 2571 Alfred Fazldeen Cubbitch Barta Native Title Claimants Aboriginal Corporation 55 Nightingale Road Pheasants Nest NSW 2574 Gordon Morton Darug Aboriginal Cultural Heritage Assessments 28 Calala St Mt Druitt NSW 2770 Justine Coplin Darug Custodian Aboriginal Corporation PO Box 81

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

			Windsor NSW 2756 Grey Morley Darug Tribal Aboriginal Corporation PO Box 441 Blacktown NSW 2148 Yvonne Simms La Perouse Botany Bay Aboriginal Corporation \ 2/3 Birch Crescent East Corrimal NSW 2518 Keith Ball Wadi Wadi Coomaditchie Aboriginal Corporation 2/3 Birch Crescent East Corrimal NSW 2518 Paul Cummins Woronora Plateau Gundungara Elders Council 2/3 Birch Crescent East Corrimal NSW 2518

Is the site important to local Aborigines			
Verbal/written reference sources	AMBS (in prep) Stage B1 Glenfield Station Aboriginal Heritage Assessment. Report to Parsons Brinckerhoff Australia Pty Ltd.	**ASR report number(s)**	C- C-
Photographs taken	Yes	**No of Photos attached**	2
Site recorded by	Jenna Weston	**Date of recording**	28 July, 2008
Address/institution	Australian Museum Business Services 6 College St Sydney NSW 2010		

Glenfield 1 artefact details.

Material	Colour	Maximum Size (cm)	Artefact Type
Silcrete	Red	1	Heat shatter

Glenfield 1 location. View to north, showing train line in background.

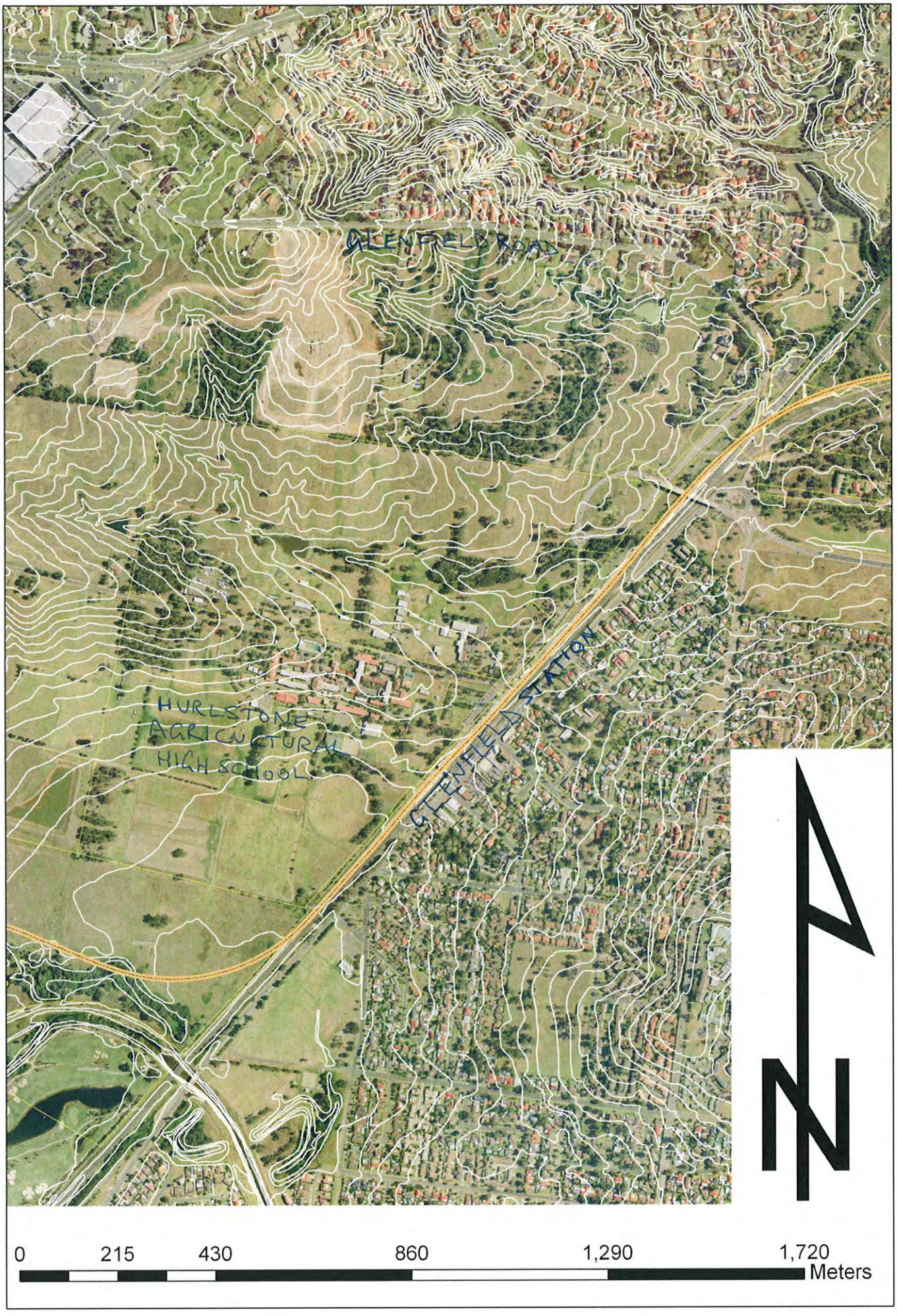
Glenfield 1 silcrete artefact.

0 70 140 280 420 560
Meters

Map Datum: GDA 1994

N

Australian museum


GLENFIELD ROAD
HURLSTONE AGRICULTURAL HIGH SCHOOL
GLENFIELD STATION
N
0
215
430
860
1,290
1,720
Meters

[✓] New recording [ ] Additional Info

National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444

Standard Site Recording Form Revised 5/88

45-6-2428

1:250,000 map sheet: SYDNEY WOLLONGONG NPWS Code 45

AMG Grid reference (Full reference - please include leading digits)
250K 30 62 00 mE (25K) 250K 62 39 60 00 mN (5/8, 25K)

Scale of map used for grid reference (Please use largest scale available) [ ] 25K [✓] 50K (preferred) [ ] 100K [ ] 250K

1:25K, 50K, 100K map name: LIVERPOOL

HEAD OFFICE USE ONLY:
NPWS Site no: 45-6-2428
Site types: SCARRED TREE
Accessioned by: BE Date: 25 NOV 1994
Data entered by: Date:

Owner/Manager: STATE RAIL AUTHORITY, NSW
Address:

Site name: GLENFIELD S.T. Locality/property name: RAIL RESERVE

NPWS District: STH. MET. Region: CENTRAL

Reason for investigation
Archaeological survey of proposed Moomba to Sydney ethane pipeline between Wilton and Botany, NSW

Portion no:
Parish:

Photos taken? Yes
How many attached? Yes (1)

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff (Draw diagram on separate sheet.)
Approach from Canterbury Rd. Cambridge Ave., Glenfield. Enter gate of sand mining area at "Hazelwood Park. Turn west and head toward railway line for 20-30m. Located on edge of vegetation track from railway fence

Other sites in locality? Site Types include:
Are sites in NPWS Register?

Have artefacts been removed from site? N/A When? N/A
By whom? Deposited where?

Is site important to local Aborigines? Yes
Give contact(s) name(s) + address(es) Ms. Narda Ingrey, Thaawal LALC P.O. Box 20 BUXTON NSW

Contacted for this recording? Yes
(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report). English, A.J. (1994) Archaeological survey of proposed Moomba to Sydney Ethane pipeline. Wilton to Botany, NSW
NPWS Report Catalogue #

Checklist: surface visibility, damage/disturbance/ threat to site

Condition of site: Excellent. Tree is living. No noticeable deterioration and not under threat when recorded.

Recommendations for management & protection (attach separate sheet if necessary):
See Report

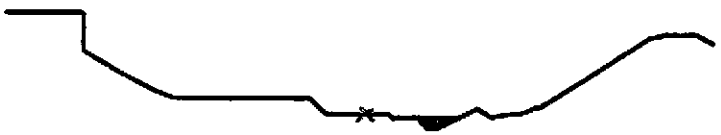
Site recorded by: Tony English Date: 22nd Sep. 1994
Address/institution: 41 Junior St., Leichhardt NSW 2040

SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no:

1. Land form a. beach/hill slope/ridge top, etc: Flat b. site aspect: west c. slope: 0-2°

d. mark on diagram provided *or* on your own sketch the position of the site: e. Describe briefly:



f. Local rock type: g. Land use/effect:

2. Distance from drinking water: 200 m Source: Glenfield Creek

3. Resource Zone associated with site (estuarine, riverine, forest etc): Open woodland + scrub

4. Vegetation: Open eucalypt woodland.

5. Edible plants noted:

6. Faunal resources (include shellfish):

7. Other exploitable resources (river pebbles, ochre, etc):

Site type:
SCARRED TREE

CHECKLIST TO HELP:
length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock.
DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types.
ART: area of surface decorated, motifs, colours, wet, dry pigment, technique of engraving, no. of figures, sizes, patination.
BURIALS: number & condition of bone, position, age, sex, associated artefacts.
TREES: number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth.
QUARRIES: rock type, debris, recognisable artefacts, percentage quarried.
OTHER SITES EG. structures (fish traps, stone arrangements, bora rings, mia mias), mythological sites, rock holes, engraved groove channels, contact sites (missions massacres cemeteries) as appropriate

DESCRIPTION OF SITE & CONTENTS.
Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

Species: Eucalyptus spp.

Scar Measurements (maximum)

- Length (incl. regrowth): 198 cm.
- Inside scar length: 195 cm
- Width (incl. regrowth): 50 cm
- Inside width: 32 cm
- Width of regrowth: 3.5 cm
- Depth of regrowth: 7 cm
- Height of inside scar above grd: 0 cm
- Orientation: west
- Landform: flat
- Associated sites: None known
- Comment: Tall mature living tree. No evidence of axe marks on scar

Attach sketches etc. eg. plan & section of shelter, show relation between site contents, indicate north, show scale.
Attach annotated photos (stereo where useful) showing scale, particularly for art sites.

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☐ Additional information ☒

SITE IDENTIFICATION

Site name	Glenfield S.T. (additional information)	NPWS Site Number	45-6-2428
Owner/manager			
Owner Address			

LOCATION

Location	Lot 3 DP735524				
How to get to the site	Coming from Sydney, travel west on the Hume Highway, bear left at Campbelltown Road, turn left at Glenfield Road, turn right at the roundabout, turn left at the next roundabout, then turn right onto an access road next to the railway line. Walk into the fenced paddock area, and the tree is located c..30m west north west of the treed fencline of the adjoining property.				
1:250,000 map name				NPWS map code	
AMG Zone	56	AMG Easting	306210	AMG Northing	6239615
Method for grid reference	Hand-held GPS	Map scale (if method = map)	1:25,000	Map name	
NPWS District				NPWS Zone	Sydney Zone
Portion no.				Parish	

SITE DESCRIPTION

Site type(s)	Scarred tree	Site type code (NPWS use only)	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	This site is located within an open area adjacent to a series of houses, within Lot 3 DP735524. The tree was previously recorded by Anthony English, and was relocated during the current survey, but not subject to a second recording. However, it was noted that metal wire was wrapped around the base of the tree, and the wood is beginning to decay near the base of the scar. These factors indicate that the tree is in a disturbed and deteriorating condition.		

Version: June 1998 Data entered by: Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

SITE ENVIRONMENT

Land form	Flat	**Aspect**		**Slope**	
Mark position of the site					
Local rock type		**Land use/effect**			
Distance from drinking water	150m	**Source**	Glenfield Creek		
Resource zone (eg. estuarine, river, forest)		**Vegetation**			
Edible plants		**Faunal resources** (include shellfish)			
Other exploitable resources (eg. ochre)					
Are there other sites in the locality	Yes	**Are they in the Sites Register**	Yes	**Other site types include**	Stone artefact scatters, isolated finds

SITE MANAGEMENT

Site condition	Disturbed		
Management recommendations	Site should not be impacted by the proposed upgrade works to the railway line, however it is recommended that any access to the fenced paddock within which the tree is located will necessitate the erection of fencing around a 10m buffer zone surrounding the tree, during construction works, so as to prevent accidental impact (eg from vehicle access).		
Have artefacts been removed from site	No	**When**	
By whom		**Deposited at**	
Consent applied for	☐	**Consent issued**	☐
Date of issue		**Consent number**	

SITE INSPECTION AND RECORDING

Reason for investigation	Aboriginal heritage assessment for proposed upgrade of Glenfield railway station		
Were local Aborigines contacted or present for the recording	☐ Not contacted ☒ Contacted and present ☐ Contacted but not present	**Names and addresses**	Cliff Foley Dharawal Local Aboriginal Land Council PO Box 20 Buxton NSW 2571 Alfred Fazldeen Cubbitch Barta Native Title Claimants Aboriginal Corporation 55 Nightingale Road Pheasants Nest NSW 2574 Gordon Morton Darug Aboriginal Cultural Heritage Assessments 28 Calala St Mt Druitt NSW 2770 Justine Coplin Darug Custodian Aboriginal Corporation

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

			PO Box 81 Windsor NSW 2756 Grey Morley Darug Tribal Aboriginal Corporation PO Box 441 Blacktown NSW 2148 Yvonne Simms La Perouse Botany Bay Aboriginal Corporation \ 2/3 Birch Crescent East Corrimal NSW 2518 Keith Bail Wadi Wadi Coomaditchie Aboriginal Corporation 2/3 Birch Crescent East Corrimal NSW 2518 Paul Cummins Woronora Plateau Gundungara Elders Council 2/3 Birch Crescent East Corrimal NSW 2518

Is the site important to local Aborigines			
Verbal/written reference sources	AMBS (in prep) Stage B1 Glenfield Station Aboriginal Heritage Assessment. Report to Parsons Brinckerhoff Australia Pty Ltd.	**ASR report number(s)**	C- C-
Photographs taken	Yes	**No of Photos attached**	2
Site recorded by	Jenna Weston	**Date of recording**	28 July, 2008
Address/institution	Australian Museum Business Services 6 College St Sydney NSW 2010		

Glenfield S.T. location. View to north east, showing edge of tree line behind adjacent house.

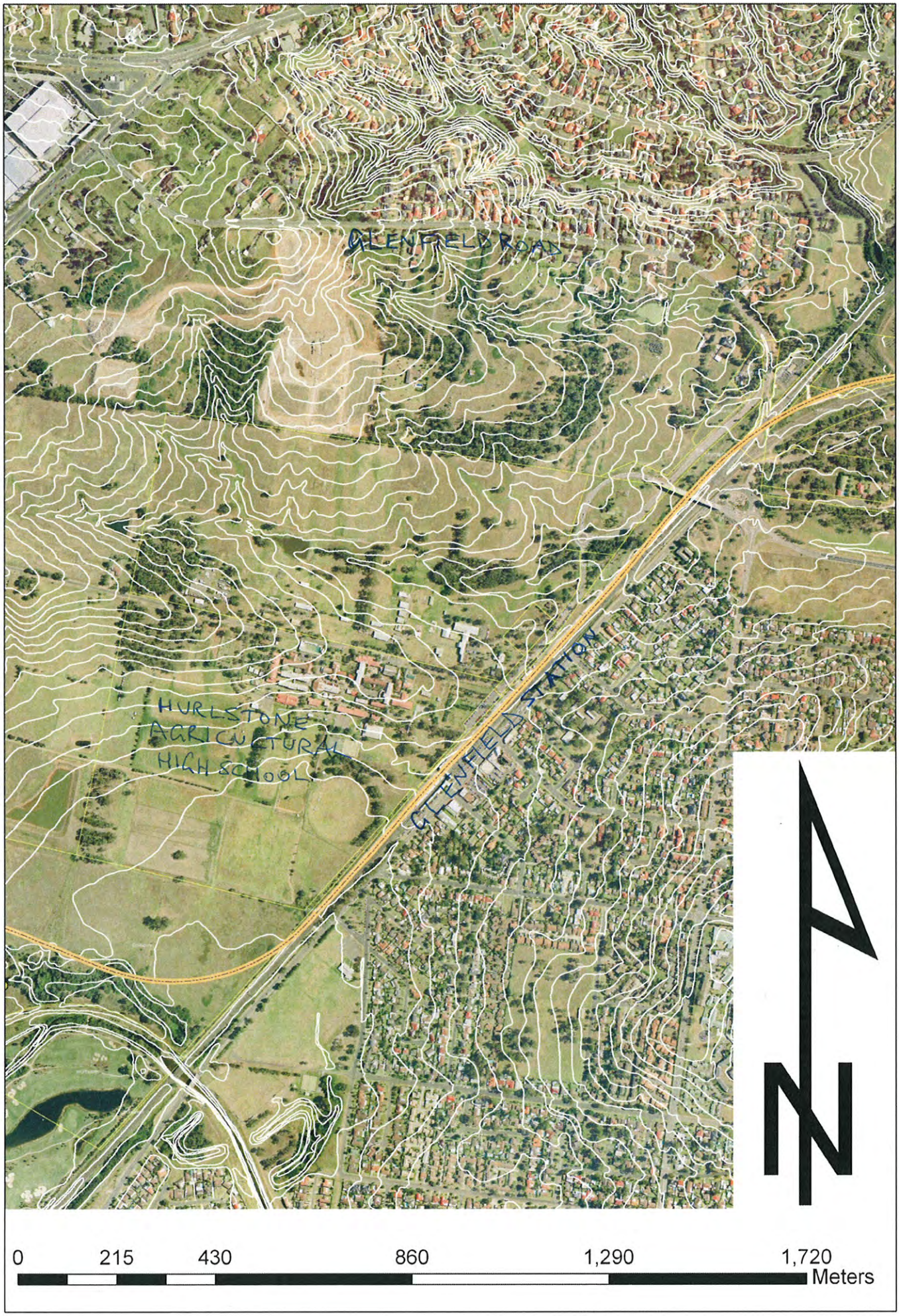
Metal wire wrapped around base of scarred tree.

0 70 140 280 420 560 Meters

Map Datum: GDA 1994

N

Australian museum


GLENFIELD ROAD
HURLSTONE AGRICULTURAL HIGH SCHOOL
GLENFIELD STATION
N
0
215
430
860
1,290
1,720
Meters

APPENDIX 2: ABORIGINAL COMMUNITY CONSULTATION

Organisation/Group	Representative Contacted	Date	Comments	AHMS Contact
Cubbitch Barta Native Title Claimants Aboriginal Corporation	Glenda Chalker	11.5.12	Invited a representative to attend a site visit of the study area	Alan Williams
Tharawal LALC	Elwyn Brown	11.5.12	Invited a representative to attend a site visit of the study area	Alan Williams
Aboriginal Land Rights Act 1983	The Office of the Registrar	15/5/12	Sent letter via express post	Carmel Prunty
Campbelltown City Council	General Manager	15/5/12	Sent letter via express post	
Sydney Metropolitan Catchment Management Authority	General Manager	15/5/12	Sent letter via express post	Carmel Prunty
Tharawal Local Aboriginal Land Council	Elwyn Brown	15/5/12	Sent letter via express post	Carmel Prunty
Native Title Services Corporation	General Manager	15/5/12	Sent letter via express post	
Metropolitan Branch	Lou Ewins	15/5/12	Sent letter via express post	
Native Title Services Corporation	Nakari Thorpe	22.5.12	Provided information on the region showing no active or finalised claims.	Alan Williams
NTSCorp	Peter Schultz	22.5.12	Advised that he had distributed my information to all cultural knowledge holders known to NTSCorp for the region, and asked that they contact me.	Alan Williams
OEH	Lou Ewins	17.5.12	Provided a list of Aboriginal stakeholders requiring consultation	Alan Williams
DACHA	Celestine Everingham	28.5.12	Registered an interest in the project	Alan Williams
Campbelltown MacArthur Advertiser	Via email	06.06.12	Notification of advert	Carmel Prunty
Darug Tribal Aboriginal Corporation	Sandra Lee	1.6.12	E-mailed notification letter seeking their interest	Alan Williams
Darug Custodian Aboriginal Corporation	Leanne Watson	1.6.12	E-mailed notification letter seeking their interest	Alan Williams
Darug Aboriginal Cultural Heritage Assessments	Celestine Everingham	1.6.12	Posted notification letter seeking their interest	Alan Williams
Tharawal LALC	Elywn Brown	1.6.12	E-mailed notification letter seeking their interest	Alan Williams
Gandangara LALC	Mikael Smith	1.6.12	E-mailed notification letter seeking their interest	Alan Williams
Peter Falk Consultancy	Peter Falk	1.6.12	E-mailed notification letter seeking their interest	Alan Williams
Tocomwall	Scott Franks	1.6.12	E-mailed notification letter seeking their interest	Alan Williams
Darug Aboriginal Landcare	Des Dyer	1.6.12	E-mailed notification letter seeking their interest	Alan Williams

Organisation/Group	Representative Contacted	Date	Comments	AHMS Contact
Inc				
Darug Land Observations	Gordon Workman	1.6.12	E-mailed notification letter seeking their interest	Alan Williams
Cubbitch Barta Native Title Claimants Aboriginal Corporation	Glenda Chalker	1.6.12	Posted notification letter seeking their interest	Alan Williams
Gunjeewong Cultural Heritage Aboriginal Corporation	Cherie Turrise	1.6.12	Posted notification letter seeking their interest	Alan Williams
Darug Aboriginal Landcare Inc	Des Dyer	4.6.12	DALI registered an interest in the project	Alan Williams
Darug Land Observations	Gordon Workman	4.6.12k	DLO registered an interest in the project	Alan Williams
Peter Falk Consultancy	Peter Falk	5.6.12	Peter Falk registered an interest in the project.	Alan Williams
Darug Aboriginal Cultural Heritage Assessments	Celestine Everingham	5.6.12	DACHA re-registered an interest in the project	Alan Williams
Tharawal LALC	Elywn Brown	6.6.12	Registered an interest in the project and confirmed that the subject area was within the TLALC's boundaries	Alan Williams
Darug Custodian Aboriginal Corporation	Leanne Watson	9.6.12	DCAC registered an interest in the project.	Alan Williams
Tocomwall	Scott Franks	8.6.12	Tocomwall registered an interest in the project.	Alan Williams
Campbelltown City Council	Andrew Spooner	12.6.12	Provided information on Aboriginal stakeholders in the region, specifically the Tharawal LALC	Alan Williams
OEH	Lou Ewins	18.6.12	Provided a letter outlining the Aboriginal stakeholders who had registered an interest.	Alan Williams
Tharawal LALC	Elwyn Brown	18.6.12	Provided a letter outlining the Aboriginal stakeholders who had registered an interest.	Alan Williams
All RAPs	-	22.6.12	Provided a proposed methodology for the ACHA	Alan Williams
Darug Aboriginal Cultural Heritage Assessments	Celestine Everingham	26.6.12	Reviewed and approved the methodology proposed for the ACHA.	Alan Williams
Darug Custodian Aboriginal Corporation	Leanne Watson	27.6.12	Reviewed and approved the methodology proposed for the ACHA.	Alan Williams
Darug Land Observations	Gordon Workman	9.7.12	Discussed this project and several others. Advised of a site visit in late July.	Alan Williams
Cubbitch Barta Native Title Claimants Aboriginal Corporation	Glenda Chalker	7.7.12	Provided comments on the re-zoning report. Supported report and recommendations	Alan Williams
DLO, DACHA, DCAC, DALI,	-	20.7.12	Rang and e-mailed everyone regarding a site visit	Alan Williams

Organisation/Group	Representative Contacted	Date	Comments	AHMS Contact
Tocomwall, Peter Falk Consultancy			next week	
DLO, DACHA, DCAC, Tocomwall, Peter Falk Consultancy		23.7.12	Email to confirm site visit on Wednesday	Fenella
Peter Falk Consultancy	Peter Falk	23.7.12	Email from Peter to say that he is unavailable on Wednesday. Fenella to send copies of site photos and any artefact photos.	Fenella
DLO, Tocomwall, DACHA, DCAC	Gordon Workman, Margaret Crawford, Gordon Morton, Alyce Mervin	25.7.12	Undertook site visit with the RAPs. Investigated the proposed development footprint and the wider study area. No specific issues with the development raised	Alan Williams
DALI	Des Dyer	25.7.12	Met with Des in public carpark within the study area to discuss the project and survey findings. DALI has no insurances so could not be permitted on site. Des had no issues with the project or likely recommendations.	Alan Williams
DLO	Gordon Workman	30.7.12	Gordon emailed his photos from the site visit.	Fenella Atkinson
Peter Falk Consultancy	Peter Falk	1.8.12	Email to Peter to summarise results of site visit.	Fenella Atkinson

NSW GOVERNMENT | Office of Environment & Heritage

Our reference: DOC12/19622

Attn: Alan Williams
Archaeological Heritage Management Solutions
349 Annandale St
Annandale NSW 2038

Dear Mr Williams,

Thank you for your letter dated 14/5/2012 to the Office of Environment and Heritage (OEH) regarding obtaining a list of the Aboriginal stakeholders that may have an interest in projects for the area of the Glenfield Waste Deport (Blacktown LGA).

Before making an application for the issue of an Aboriginal Heritage Impact Permit, the applicant must carry out an Aboriginal community consultation process in accordance with the National Parks and Wildlife Regulation 2009 and completed to the stage described in subclause 80C.

Please find attached the list of Aboriginal stakeholders known to OEH that may have an interest in the project. OEH's list of regional stakeholders is a list of groups, organisations or individuals who may hold cultural knowledge relevant to a proposal in a region. Consultation with Aboriginal people should not be confused with employment. Inclusion on the OEH's list is not an automatic right to employment. It is the decision of a proponent on who they choose to engage to deliver services based on a range of considerations including skills, relevant experience, and OHS considerations. To be clear, the proponent is under no obligation to employ Aboriginal people registered for consultation.

Further, receipt of this information does not remove the requirement of a proponent/consultant to advertise in local print media and contact other bodies seeking interested Aboriginal parties. Consultation with Aboriginal stakeholders must be in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* which can be found on the Office of Environment and Heritage (OEH) public website by accessing the following link:

http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09781ACHconsultreq.pdf

Please note that these requirements replace the *Interim Community Consultation Requirements for Applicants, December 2004.*

PO Box 668 Parramatta NSW 2124
Level 7, 79 George St Parramatta NSW 2150
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ABN 30 841 387 271
www.environment.nsw.gov.au

If you wish to discuss any of the above matters further please contact Margrit Koettig, Archaeologist, on (02) 9995 6866.

Yours sincerely

Lou Ewins 21/5/12

Lou Ewins
Manager Planning & Aboriginal Heritage
Office of Environment and Heritage
Department of Premier and Cabinet

Aboriginal Stakeholders that may have an interest: Camden LGA and surrounds

Darug Custodial Aboriginal Corporation	Leanne Watson	02 4577 5181 / 0415 770 163	PO Box 81, Windsor NSW 2756
Darug Tribal Aboriginal Corporation	Sandra Lee	02 9622 4081	PO Box 441, Blacktown NSW 2148
Darug Aboriginal Cultural Heritage Assessments	Gordon Morton	02 4567 7421 or 0422 865 831	90 Hermitage Rd, Kurrajong Hills NSW 2758
Darug Land Observations	Gordon Workman	0415 663 763/ fax 02 9831 8868	PO Box 571, Plumpton, NSW 2761
Darug Aboriginal Land Care Inc	Des Dyer	0408 360 814	18a Perigee Close, Doonside 2767
Cubbitch Barta	Glenda Chalker	0427 218 425	55 Nightingale Rd, Pheasants Nest NSW 2574
Gunjeewong Cultural Heritage Aboriginal Corporation *	Cherie Carroll Turrise	(02) 6355 5673	1 Bellvue Place, Portland NSW 2847
Peter Falk Consultancy	Peter Falk	0401 938 060	Po Box 1018 Mittagong NSW 2575
Scott Franks		0404 171 544	PO Box 76, Caringbah NSW 1495
Tharawal LALC	Robyn Straub	(02) 46810059	PO Box 20 Buxton NSW 2571
Gandangara LALC	Mark (Jack) Johnson	(02) 96025280	PO Box 1038 Liverpool NSW 2170

*Cherie is Ngunnawal Elder however lived in the Western Sydney area during her childhood. She recognises she is not from the area but has associations.

campbelltown
city council

12 June 2012

Alan Williams
Archaeological & Heritage Management Solutions
349 Annandale Street
ANNANDALE, NSW 2038

Dear Mr Williams

RE: Request for Information on Aboriginal Stakeholders for proposed rezoning and development at Glenfield Waste Disposal, Glenfield, NSW

I refer to your letter dated 14 May 2012 seeking information on relevant Aboriginal individuals and/or communities that may hold cultural knowledge of relevance to determining the significance of Aboriginal objects and/or places for the above mentioned proposed rezoning and development.

It is recommended that you liaise with the following group as part of the archaeological/Aboriginal Heritage Assessment process:

Tharawal Local Aboriginal Land Council
CEO Mr Greg Bonder
PO Box 168
PICTON NSW 2571
Phone: (02) 4681 0059

If you require any further information please contact Angela Taylor (Senior Environmental Officer) on 4645 4847.

Yours sincerely

Andrew Spooner
Acting Manager Environmental Planning

ntscorp

abn: 71 098 971 209
w: www.ntscorp.com.au

22 – 5 - 2012

ref: OEH : 22 -05-2012/3

Alan Williams
Manager NSW – Aboriginal Heritage
AHMS
349 Annandale St
ANNANDALE NSW 2038

Dear Mr Williams

Aboriginal Cultural Heritage Assessment

proposed re-zoning and development at Glenfield Waste Disposal - Glenfield

I refer to your letter of **14 May 2012** regarding the above matter.

We acknowledge that section 4.1.2 of the Office of Environment & Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* require you to contact us in order to compile a list of Aboriginal people who may have an interest for the proposed project area and hold knowledge relevant to determining the cultural significance of Aboriginal objects and/or places. However, we advise that NTSCORP's privacy guidelines restrict us from providing proponents with contact details of traditional owners who may have such an interest or hold such knowledge.

Please be advised that, in response to your notification, we will forward your correspondence to any individuals, groups and organisations whom NTSCORP is aware assert traditional interests within or hold cultural knowledge about the relevant area. Recipients of our correspondence will be invited to register their interest in the project directly with you **as soon as possible.**

Please be aware that NTSCORP cannot make a guarantee or undertaking that the recipients of our correspondence represent the entirety of traditional owners for the relevant area.

Yours faithfully,

Peter Schultz
Senior Consultant – Land & Notifications
NTSCORP Limited

Head Office
Level 1, 44-70 Rosehill Street, Redfern NSW 2016
PO Box 2105 Strawberry Hills NSW 2012
p: + 61 2 9310 3188
f: + 61 2 9310 4177
freecall: 1800 111 844

Regional Office (Coffs Harbour)
Suite 2, 133 West High Street, Coffs Harbour NSW 2450
PO Box 158 Coffs Harbour NSW 2450
p: + 61 2 6651 4588
f: + 61 2 6651 7954

National Native Title Tribunal

South-East & Central Registry –Sydney Office
Level 25, 25 Bligh Street
Sydney NSW 2000
GPO Box 9973
Sydney NSW 2001
Telephone (02) 9227 4000
Facsimile (02) 9227 4030

22 May 2012

Alan Williams
Archaeologist
Archaeological & Heritage Management Solutions P/L
349 Annandale Street
Annandale NSW 2038

Our Reference: 4911/12sj
Your Reference: 12057-1

Dear Mr Williams

Native Title Search Results of Glenfield within Campbelltown City Council Local Government Area

Thank you for your search request received on 14 May 2012 in relation to the above area.

Search Results
The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

Register Type	NNTT Reference Numbers
Schedule of Applications (unregistered claimant applications)	Nil.
Register of Native Title Claims	Nil.
National Native Title Register	Nil.
Register of Indigenous Land Use Agreements	Nil.
Notified Indigenous Land Use Agreements	Nil.

At the time this search was carried out, there were **no relevant entries** in the above databases.

Please note: There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

Tribunal accepts no liability for reliance placed on enclosed information

The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

If you have any further queries, please do not hesitate to contact me on the number below or on the free call number 1800 640 501.

Yours sincerely

Nakari Thorpe
Senior Case Management Assistant
Telephone: (02) 9227 4004
Facsimile: (02) 9227 4030
Email: Nakari.thorpe@nntt.gov.au

Searching the NNTT Registers in New South Wales

Search service
On request the National Native Title Tribunal will search its public registers for you. A search may assist you in finding out whether any native title applications (claims), determinations or agreements exist over a particular area of land or water.

In New South Wales native title cannot exist on privately owned land including family homes or farms.

What information can a search provide?
A search can confirm whether any applications, agreements or determinations are registered in a local government area. Relevant information, including register extracts and application summaries, will be provided.

In NSW because we cannot search the registers in relation to individual parcels of land we search by local government area.

Most native title applications do not identify each parcel of land claimed. They have an external boundary and then identify the areas not claimed within the boundary by reference to types of land tenure e.g., freehold, agricultural leasehold, public works.

What if the search shows no current applications?
If there is no application covering the local government area this only indicates that at the time of the search either the Federal Court had not received any claims in relation to the local government area or the Tribunal had not yet been notified of any new native title claims.

It does not mean that native title does not exist in the area.

Native title may exist over an area of land or waters whether or not a claim for native title has been made.

Where the information is found
The information you are seeking is held in three registers and on an applications database.

National Native Title Register
The National Native Title Register contains determinations of native title by the High Court, Federal Court and other courts.

Register of Native Title Claims
The Register of Native Title Claims contains applications for native title that have passed a registration test.

Registered claims attract rights, including the right to negotiate about some types of proposed developments.

Register of Indigenous Land Use Agreements
The Register of Indigenous Land Use Agreements contains agreements made with people who hold or assert native title in an area.

The register identifies development activities that have been agreed by the parties.

Application summaries
An application summary contains a description of the location, content and status of a native title claim.

This information may be different to the information on the Register of Native Title Claims, e.g., because an amendment has not yet been tested.

How do you request a search?

A search request form is available on the Tribunal's web site at:
http://www.nntt.gov.au/registers/search.html
Mail, fax or email your request to the
Tribunal's Sydney registry, identifying the local government area/s you want searched.

Email: SydneySearch@nntt.gov.au
Fax: (02) 9227 4030
Address: GPO Box 9973, Sydney NSW 2001
Phone: (02) 9227 4000

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ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS
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Annandale, NSW 2038
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Brunswick, VIC 3056
P: (03) 9388 0622
PERTH
13/336 Churchill Ave
Subiaco, WA 6008
P: (08) 6262 2025
W: www.ahms.com.au E: info@ahms.com.au ABN: 45 088 058 388 ACN: 088 058 388

1 June 2012

Our ref: 1200507-1

«First_Name» «Last_Name»
«Company_Name»
«Address_Line_1»
«City» «State» «ZIP_Code»

Re: Notification of Aboriginal Cultural Heritage Assessment – Glenfield Waste Disposal Recycling Facility
Project Information and Invitation for Registration of Interest

Dear «First_Name»,

In accordance with the NSW Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*, I am writing to notify you that we have been engaged by L.A. Kennett Enterprises Pty Ltd to undertake an Aboriginal Cultural Heritage Assessment and/or Aboriginal Heritage Impact Permit applications for a proposed recycling facility at the Glenfield Waste Disposal, Glenfield, NSW (**Figure 1**).

In addition, the site is currently under-going a re-zoning application with the Campbelltown City Council. A preliminary assessment has already been undertaken of the proposed site as part of the proposed re-zoning. The preliminary assessment indicates that much of the study area has been disturbed by the current land use activities. However, four sites (two scarred trees, an isolated find and a potential archaeological deposit) were noted.

L.A. Kennett Enterprises Pty Ltd proposes to construct a new recycling facility along the edge of the current landfill site (**Figure 2**). The land in question is located on Cambridge Avenue within the Campbelltown Local Government Area (Auto Consol 14018 -92 (Lot 91 DP 1155962, Lot 2 DP 333578, Lot 1 DP 113201); Lot 3, DP 735524; Lot 3, DP 736881). The proponent is L.A. Kennett Enterprises who can be contacted via Simon Duffy - Environmental Property Services (A: Level 1, 19 Stockton Street, NELSON BAY NSW 2315; T: 02 4981 1600).

The proposed recycling facility will be assessed under Part 4 (Division 4.1 State significant development) of the *Environmental Planning and Assessment Act 1979,* and therefore AHMS is undertaking an Aboriginal Cultural Heritage Assessment in accordance with the *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005) as well as the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, April 2011), *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, April 2010), and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, September 2010). An important part of the assessment will be Aboriginal community consultation that aims to identify cultural values and places of importance to the Aboriginal community within the subject land.

An additional purpose of the Aboriginal community consultation may be to assist the applicant in the preparation of an application for an Aboriginal Heritage Impact Permit (AHIP) should it be necessary, as well as to assist the Office of Environment and Heritage to consider and determine any such application.

We are inviting registrations from Aboriginal individuals and/or organisations, who may hold cultural knowledge for the area relevant to determining the significance of Aboriginal objects and/or places and who wish to be involved in the community consultation process.

If you or your organisation are interested in being part of the consultation process, please provide a registration of interest to:

Alan Williams
Address: AHMS, 349 Annandale Street, Annandale, NSW 2038;
Phone: 02 9555 4000;
Fax: 02 9555 7005; or
Email: awilliams@ahms.com.au.

Registrations are requested on or by **14 June 2012.**

To assist us with communicating project information effectively could you please include the following information in your registration of interest:

1. A clear identification of the organisation registering an interest in the project;
2. Your preferred method of communication with AHMS and the proponent during consultation for this project, including a nominated contact person and contact details;

3. Comment on the level of consultation / project involvement you require (Do you wish to attend any meetings? Do you wish to be involved in any fieldwork? Do you simply want a copy of the final report?);
4. If you wish to be involved in any meetings or fieldwork, please ensure we have current copies of your public liability, workers compensation and professional indemnity (if available) insurances as soon as possible.

As part of the consultation process we are obliged to provide the contact details of organisations and individuals who register an interest to the OEH and the Tharawal LALC. Please advise us if you do not wish this to occur.

Please also consider the following questions, but note that these issues can also be discussed over the course of the project:

5. Guidance on the protocols, sensitivity, use and/or distribution of any cultural information that you provide to AHMS and the proponent as part of this project;
6. Identification of any Aboriginal objects or places of cultural significance that you are aware of within or in the vicinity of the proposed activity area.

Please note that registration of interest will not necessarily lead to participation in fieldwork. Participants will be engaged by the client on the basis of experience, cultural knowledge, appropriate insurances and our personnel requirements.

Please don't hesitate to contact me on (02) 9555 4000 if you have any queries or concerns.

Yours faithfully,

Alan Williams
Archaeologist

CLASSIFIEDS

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P: 13 24 25
E: fcnclass@fairfaxmedia.com.au

Deaths and Funerals

DUGUID
James Munro (Jim)
Late of The Oaks

Passed away on
3rd June 2012

Aged 70 Years

Dearly loved husband of Kaye. Loving father and father-in-law of Linda and Husty, Sharon, Daryl and Anny. Cherished Pop to Bryce, Alex, Abby, Jack and Rarnie. Dear brother, uncle and friend to many.

Gone to the
19th Hole Forever.

Family and friends are kindly invited to attend a celebration of Jim's life which will be held in the South Chapel, Forest Lawn Crematorium, Leppington on Tuesday 12th June 2012 commencing at 2:30pm. In lieu of flowers, donations to Camden Hospital would be appreciated.

WILLIAM R. GROVES FUNERAL DIRECTOR
Picton 4677 1644
Camden 4655 6433

SMITH
Mirrie
4.6.1921 - 315.2012
In her 91st Year

Mirrie died peacefully at Nareen Gardens Nursing Home in the presence of her children Ann-Maree and Andrew. Mirrie who's home was in Wyong, was the youngest child of John and Annie Hall of "Winbourne" Elderslie (via Camden). She was the devoted wife of Colin (dec 1974). Mirrie was sister to Ted, Hilda, Ada, Marge, Harry, George and Eileen (all dec). She was the mother-in-law and friend to Alan, Grandmother and grandmother in law of Ben and Lisa, Luke, Emma and Winston. Great grandmother of Toby, Macy and Joey.

Loved beyond measure

The relatives, friends and carers of Mirrie are cordially invited to attend her Funeral Service to be conducted by the Reverend Dan Conner at St James Anglican Church, Wyong at 1pm on Tuesday 12th June, 2012. At the condusion of the service the cortege will proceed to Jilliby Cemetery where she will be laid to rest with her late husband.

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In Memoriam

CHESHAM
Lynda Narelle

25/12/1953 - 4/6/2008

Sadly missed by Graham, boys Andrew, Jason & Bradley & grandkids Dean, Abbey, Isabella & Riley.

LEE OCKENDEN
18/3/1974 - 11/6/2003
Rembering Lee from his family. Lest We Forget.

In Memoriam

ATTEWELL
William (Bill)
26.6.63 - 5.6.11

It's been a year since you left us and not a day goes by that we don't miss you and wish you were here.

Love always, Jessica, Luke, Paige and your five Grandchildren xxx

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In Memoriam

ATTEWELL
William Leslie (Bill)
26/6/63 - 5/6/2011

It's been a year since you left us.
Missing you is like having days without sunshine.
It's one endless night.
Love still grows and fills me when I think of you or see your face.

All my love
Danielle xx

WRIGHT (nee Coles)
Julie Anne
9.10.61 - 3.06.08

We thought of you with love today, but that is nothing new.
We thought about you yesterday and the day before that too.
We will never fail to think of you, we will never cease to care, but how we wish we could turn around and find you standing there.

Love always,
Mum & Dad, Simon & Deb xxx.

Kevin Stephen Hyland
23/10/1959 - 07/06/2003

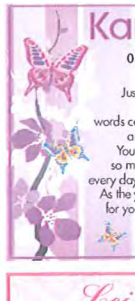
In memory of our loving Father, Grandfather, Son, Brother and Uncle.

Sadly Missed
Loved Forever
The Hylands'

Donald James Laws (Donnie)
9.6.2010

We think about you always and talk about you too.
We have your precious memories, but wish we still had you.

Love Beryl, Ricky, Karina, Clayton and seven grandchildren



Karen Burgess
05/10/1969 - 03/06/2008

My Darling Karen,
Just as there is no way to measure all the love you gave us, words cannot describe how special you were and how much you were loved.
You were so wonderful and brought so much joy and fulfilment to our lives, every day reminds me of how much I miss you.
As the years pass, my love does not waver, for you are my soul mate, together soon.

Love always and forever
Matt xx

Leisa Ann Shaw
"Princess"
4/5/86 - 6/6/04

Yet another year has passed without you but our memories and your smile keep us going.

Love always
Mum, Dad, Daniel and family & friends.

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LOST Mt Annan 28/5 black & white male CAT with white tip on tail. Name of Milo. Phone: 4647 5926.

Childrens Parties

Melissa's Castles
melissasjumpingcastles.net
0421 048 278 9729 0636

Legal Notices

IN THE SUPREME COURT OF NEW SOUTH WALES EQUITY DIVISION - PROBATE LIST
After 14 days from publication of this notice an application for probate of the Will dated 23 November 2004 of GEORGE ORR late of Narellan in the State of New South Wales, will be made by KAREN PERRY the executrix of the Will. Creditors are required to send particulars of their claims upon his estate to: MICHAEL SLATTERY, Solicitor 11a Cordeaux Street, CAMPBELLTOWN NSW 2560 02 4628 0000.

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Public Notices

Notification of Aboriginal Heritage Assessment and Invitations for Registrations of Interest - Glenfield Waste Disposal, Glenfield.

L.A. Kennett Enterprises Pty Ltd is undertaking an Aboriginal Heritage Assessment for a proposed re-zoning and subsequent development application for the southern portion of Glenfield Waste Disposal, Glenfield, NSW.

Registrations are invited from Aboriginal individuals and/or organisations, who may hold cultural knowledge for the area relevant to determining the significance of Aboriginal objects and/or places and who wish to be involved in the community consultation process.

The purpose of the Aboriginal community consultation is to assist the proponent in preparing an Aboriginal Heritage Assessment for the project area, and if necessary to assist the Department of Planning and/or the Office of Environment and Heritage in considering the assessment.

Registrations of interest should be provided by no later than 20 JUNE 2012 to Alan Williams, of Archaeological and Heritage Management Solutions P/L, by:

Phone: (02) 9555 4000
Fax: (02) 9555 7005
Email: awilliams@ahms.com.au
Or Post: 349 Annandale Street, Annandale, NSW 2038.

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CAMPBELLTOWN Best Relaxing Full Body Chinese Massage. 3/19 Kings St, Ph: 4628 7880 0426 572 343

Massage Therapist
Wanted to sublet room in prestige weight loss and wellness centre in Narellan. Must be qual & insured. Must be ready to start 12.6.12.

Send resume to:
swcosmetictattoo@iprimus.com.au

NATUROPATH
Wanted to sublet room in prestige weight loss & wellness centre in Narellan. Must be qual & insured. Must be ready to start 12.6.12.

Send resume to
swcosmetictattoo@iprimus.com.au

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9605 9666

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The Principal
Rosemeadow Public School
64 Anthony Drive
Rosemeadow NSW 2560

Tenders close at 3 pm on Friday 15th June 2012. A tender briefing and a site visit will be held on Friday 8th June 2012 by arrangement, to discuss aspects of this tender and inspect the site. Tenderer should notify the School Admin Manager of their intention to attend.

Tenders

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Opportunity to provide services for the operation of an Out of School Hours Care Service at Appin Public School, 97 Appin Road, Appin NSW 2560

DEPARTMENT OF EDUCATION & COMMUNITIES NSW
South Western Sydney Region

Requests for documentation can be obtained at a cost of $110, from Appin Public School, 97 Appin Road, Appin NSW 2560 Tel: 0246 311 220 between 9:00am - 3:00pm Monday to Friday.

Only those who pay the documentation fee, collect the application package and submit the required documents within the timeframe will be considered in the evaluation. Applications must be in duplicate and enclosed in an envelope. NO FOLDERS please.

Applications should be received in the APPLICATION BOX at Appin Public School, 97 Appin Road, Appin NSW 2560 by 3pm on 27th June 2012 and addressed:

CONFIDENTIAL
Opportunity to provide services for an Out of School Hours Care Service
at Appin Public School

Darug Aboriginal Cultural Heritage Assessments

ABN 51734106483

Gordon Morton

Mob: 0422 865 831
Fax: 45 677 421

Celestine Everingham
90 Hermitage Rd., Kurrajong Hills, 2758
Ph/Fax: 45677 421
Mob: 0432 528 896

28 5 · 12

Attention

Alan Williams
re Glenfield Waste Disposal - Glenfield

DACHA wishes to register an interest in the above area. We wish to be consulted at all times and be involved in any fieldwork or site inspections.

I look forward to hearing from you on this project.

Yours Sincerely,
G W. Morton
&
C. Everingham

Fenella Atkinson

From: desmond dyer [desmond4552@hotmail.com]
Sent: Sunday, 3 June 2012 10:24 PM
To: Alan Williams
Subject: RE: Glenfield Waste Disposal - Part 4 (Division 4.1) development

Hi Alan,
yes the Darug Aboriginal Landcare would like to register for the Glenfield Waste Diposal
Des Dyer

From: AWilliams@ahms.com.au
To: desmond4552@hotmail.com
Subject: Glenfield Waste Disposal - Part 4 (Division 4.1) development
Date: Fri, 1 Jun 2012 00:40:40 +0000

Dear Des,

Please find attached a letter seeking to identify your interest in a proposed development at Glenfield Waste Disposal, Glenfield, NSW. Due to the newspaper advert publication (a requirement of this phase of consultation), the registration process will be ongoing until 20 June 2012 (please disregard the 14 June identified in this letter).

Happy to discuss

Thanks
Al

Alan Williams
Senior Archaeologist
AHMS ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS PTY LTD
A: 349 Annandale St, Annandale, NSW 2038
P: +61 (0)2 9555 4000
F: +61 (0)2 9555 7005
M: +61 (0)408 203 180
E: awilliams@ahms.com.au

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Fenella Atkinson

From: mulgokiwi@bigpond.com

Sent: Sunday, 10 June 2012 1:09 PM

To: Alan Williams

Subject: Glenfield Waste Disposal Recycling facility

Dear Alan
Darug Custodian Aboriginal Corporation would like to register their interest in the Glenfield Waste disposal recycling facility project.
This area is within Darug boundaries.

Regards
Leanne Watson

Fenella Atkinson

From: Peter Falk [kanga26@live.com.au]
Sent: Tuesday, 5 June 2012 11:29 AM
To: Alan Williams
Subject: RE: Glenfield Waste Disposal - Part 4 (Division 4.1) development

Alan
I wish to be registered for this project

1. Organisation: Peter Falk Consultancy
PO Box 1018
Mittagong NSW 1018
0401938060

2.Communication: Email kanga26@live.com.au

3. Level of Consult: I wish to attend all meetings and be involved in field work

4. Current Insurances; Please see Fenella as she has copy of my current insurance

As a Sole Trader I do not require Workers Comp (ref. to Workers Comp Act Sec. 155)
Thanks
Peter

Peter Falk Consultancy

From: AWilliams@ahms.com.au
To: kanga26@live.com.au
Subject: Glenfield Waste Disposal - Part 4 (Division 4.1) development
Date: Fri, 1 Jun 2012 00:44:36 +0000

Dear Peter,

Please find attached a letter seeking to identify your interest in a proposed development at Glenfield Waste Disposal, Glenfield, NSW. Due to the newspaper advert publication (a requirement of this phase of consultation), the registration process will be ongoing until 20 June 2012 (please disregard the 14 June identified in this letter).

Happy to discuss

Thanks
Al

Alan Williams
Senior Archaeologist
AHMS ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS PTY LTD
A: 349 Annandale St, Annandale, NSW 2038
P: +61 (0)2 9555 4000
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E: awilliams@ahms.com.au

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Fenella Atkinson

From: Elwyn brown [heritage@tharawal.com.au]
Sent: Wednesday, 6 June 2012 9:30 AM
To: Alan Williams
Subject: RE: Glenfield Waste Disposal - Part 4 (Division 4.1) development

Hi Alan

Yes we would like to be involved with this and yes glenfield is within the boundries of Tharawal Local Aboriginal Land Council, please let me know when this assessment will take place.

Regards,
Elwyn Brown
Cultural & Heritage Officer

Tharawal Local Aboriginal Land Council
Ph: 02 4681 0059
Fax: 02 4683 1375

I would just like to take this opportunity to pay my respects to the traditional owners of the land that we now walk on and work on
the Dharawal people, and pay my respects to all elders of this land past and present

---

From: Alan Williams [mailto:AWilliams@ahms.com.au]
Sent: Friday, 1 June 2012 11:01 AM
To: Elwyn brown
Subject: Glenfield Waste Disposal - Part 4 (Division 4.1) development

Hi Elwyn,

I realize you were involved in the first phase of this, but I am required under consultation to send this since it's a new phase of work. Please let me know if you wish to stay involved.

Please find attached a letter seeking to identify your interest in a proposed development at Glenfield Waste Disposal, Glenfield, NSW. Due to the newspaper advert publication (a requirement of this phase of consultation), the registration process will be ongoing until 20 June 2012 (please disregard the 14 June identified in this letter).

Also, the response I have from Office of Environment and Heritage indicates that Gandangara LALC are also relevant to this area. Can you confirm whether this study area is in your boundaries or theirs?

Happy to discuss

Thanks
Al

Alan Williams
Senior Archaeologist
AHMS ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS PTY LTD
A: 349 Annandale St, Annandale, NSW 2038

Tocomwall PTY LTD
ACN 137 694 618
ABN 13 137694618
PO Box 76
CARINGBAH NSW 1495
info@tocomwall.com.au

8th June 2012

Alan Williams

ARCHAEOLOGICAL &
HERITAGE MANAGEMENT
SOLUTIONS PTY LTD

349 Annandale St,
Annandale, NSW 2038

Dear Alan

RE: Request for Registration for Glenfield Waste Disposal, Glenfield, NSW

Tocomwall, trading as Yarrawalk is seeking *primary involvement* in all consultation meetings and field work for **Glenfield Waste Disposal, Glenfield, NSW Project.**

Tocomwall represents traditional owners from this and retains local and oral history on behalf of its membership. We do not accept or support any person or organisation that comments regarding the said area unless confirmed in writing by myself.

Please also be advised that this Aboriginal organisation does not do volunteer work or attend unpaid meetings.

All correspondence should be emailed to the following yarrawalk@tpg.com.au or to the above postal address.

Yours faithfully

Scott Franks
Director & Aboriginal Heritage Manager

AHMS
ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS
SYDNEY
349 Annandale St,
Annandale, NSW 2038
P: (02) 9555 4000
F: (02) 9555 7005
MELBOURNE
2/35 Hope St,
Brunswick, VIC 3056
P: (03) 9388 0622
PERTH
13/336 Churchill Ave
Subiaco, WA 6008
P: (08) 6262 2025
W: www.ahms.com.au E: info@ahms.com.au ABN: 45 088 058 388 ACN: 088 058 388

22 June 2012

Our ref: 120507-1

«First_Name» «Last_Name»
«Company_Name»
«Address_Line_1»
«City» «State» «ZIP_Code»

Re: Project Information and Proposed Aboriginal Cultural Heritage Assessment Methodology:

Glenfield Waste Disposal, Glenfield, NSW

Dear «First_Name»,

Purpose of this Document

L.A. Kennett Enterprises Pty Ltd is proposing to re-zone the Glenfield Waste Disposal, Glenfield, NSW from 1(a) rural to industrial (**Figure 1**). At the same time, development plans for a new recycling facility in the subject area are being detailed (**Figure 2**).

Aboriginal heritage in relation to the re-zoning application has already been addressed (see discussion below); the focus of this letter and associated documentation is to undertake Aboriginal consultation in relation to the proposed recycling facility.

The proposed recycling facility has yet to be designed in detail, but the general location of the facility is known (**Figure 2**). The project is proposed for approval under Part 4 (Division 4.1) of the *Environmental Planning and Assessment Act 1979,* and will therefore be assessed by the Department of Planning and Infrastructure. As part of the Environmental Approval application, an Aboriginal Cultural Heritage Assessment in accordance with *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005) is required. These guidelines in turn require consideration of the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, April 2011), *Aboriginal*

Cultural Heritage Consultation Requirements for Proponents (DECCW, April 2010), and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, September 2010).

This letter provides the background of the previous assessment, and outlines the proposed activities and methods associated with the proposed ACHA. It has been developed to address requirements of Section 4.2 and 4.3 in the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.*

If you have any comments on the methodology, please send them to AHMS, or call to discuss, by **20 July 2012**.

Contact Details

This report has been prepared by Archaeological & Heritage Management Solutions (AHMS) for Environmental Property Services (EPS) on behalf of the proponent, L.A. Kennett Enterprises Pty Ltd:

Proponent	Archaeological Advisor
Environmental Property Services Level 1, 19 Stockton Street, Nelson Bay NSW 2315 **Contact Person:** Simon Duffy T. 02 4981 1600 E: simonduffy@enviroproperty.com.au	**Archaeological & Heritage Management Solutions Pty Ltd** 349 Annandale Street Annandale NSW 2038 **Contact Person:** Alan Williams T. 02 9555 4000 F. 02 9555 7005 M.0408 203 180 E: awilliams@ahms.com.au

The Project (Proposed Activity)

Kennett Enterprises Pty Ltd is proposing to construct a large recycling facility near the existing landfill site in the subject area. While specific details are not yet available, the facility's construction footprint is broadly an L-shape running along the southern and western sides of the existing landfill site (**Figure 3**).

Background

In May 2012, L.A. Kennett Enterprises Pty Ltd proposed to both re-zone the Glenfield Waste Disposal, Glenfield, NSW from 1(a) rural to industrial, and at the same time begin the Environmental Approval process for the development of a new recycling facility in the subject area.

The application for the re-zoning was undertaken in late May 2012. It was developed to meet Campbelltown City Council requirements for inclusion in their new LEP and due to timeframes included a Preliminary Aboriginal Heritage Assessment. This assessment is attached in **Appendix 1**.

In brief, the Preliminary Assessment identified that much of the subject area had been heavily disturbed by both the current waste disposal activities and historic sand extraction. However, four Aboriginal objects/sites were identified and recorded. These included two scarred trees[1] located in the western quadrant of the study area, an isolated object in a similar location, and a large potential archaeological deposit near the Georges River (**Figure 3**). It was considered that none of these sites should hinder any re-zoning, but that further consideration of them would be considered in any future development proposals.

While the four known Aboriginal objects/sites are not within the proposed development footprint, further assessment (in the form of an ACHA) to satisfy the conditions of the Environmental Assessment application were recommended and are now being implemented.

Proposed Assessment Methodology

AHMS proposes to develop the Aboriginal Cultural Heritage Assessment (ACHA) according to the relevant OEH guidelines:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW,*
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010,*
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*.

The ACHA will include the following:

[1] *It will not be elaborated here, but it is considered that two scarred trees are probably the same site, with one tree being erroneously recorded instead of the other.*

1. A review of the archaeology, ethno-history, landscape and land-use history of the subject area and surrounding region.
2. A predictive model of the archaeological potential of the subject area.
3. Details and results of a survey of the subject area (undertaken as outlined below).
4. Details of the process and results of the Aboriginal cultural heritage consultation process undertaken for the project.
5. Assessment of the significance, both cultural and archaeological, of any Aboriginal sites, objects and/or places identified within the study area.
6. Assessment of the potential Aboriginal cultural heritage impact of the proposed development, and recommendations to manage and/or mitigate this potential impact.

The ACHA will be submitted as a draft for review to all the Registered Aboriginal Parties. Comments and recommendations received from the Registered Aboriginal Parties will be included in the final version of the ACHA.

Survey

AHMS proposes to undertake a survey of the subject area, according to the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*.

Our proposed survey team will include an AHMS archaeologist, and representatives of the Registered Aboriginal Parties. We have allowed up to one day for the survey. The survey will be designed to target the following:

- Any AHIMS sites within the subject area;
- Areas with exposed soil;
- Areas identified in the predictive modelling as having higher potential, such as along creek lines;
- Mature native trees.

The survey would involve the recording of Aboriginal objects and/or sites, as well as other relevant information including landform types, disturbance, and ground exposure and visibility. The information would be recorded using photographs, sketches, written descriptions, and co-ordinates (using a hand-held non-differential GPS). Any new sites recorded would be registered with the OEH Aboriginal Heritage Information Management System (AHIMS).

Aboriginal Consultation

Currently, the project has only undertaken informal consultation with the Tharawal LALC and Cubbitch Barta Aboriginal Corporation.

However, AHMS has recently begun the formal consultation process in accordance with OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010). Through this process 8 Aboriginal individuals/organisations have registered an interest in the project, specifically:

- Tharawal LALC.
- Cubbitch Barta Native Claimants Aboriginal Corporation.
- Darug Custodian Aboriginal Corporation.
- Darug Aboriginal Land Inc.
- Darug Land Observations.
- Peter Falk Consulting .
- Darug Aboriginal Cultural Heritage Assessments.
- Tocomwall.

Please note that unless otherwise advised, we are required to send your contact and address details to OEH as part of the consultation procedure.

Timeframes

The following is an indicative timeframe for the project:

- Distribution of this document to the RAPs: 19 June 2012;
- End of review period for the proposed methodology: 17 July 2012;
- Site Survey: week beginning 16 July 2012;
- Development of ACHA: June – mid July 2012; and
- Review and finalisation of ACHA by RAPs: mid July - mid August 2012.

Information Sought

Consistent with Section 4.3 and 4.4 of OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010,* AHMS is seeking the following information from your organisation:

1. A nominated representative of your organisation with which to undertake consultation on this project;
2. A clear identification of the organisation you are representing throughout this project;
3. Your nominated individual's contact information including phone number, fax number, postal address and e-mail (if available);
4. Your preferred method of communication with AHMS during the project. Please also provide the necessary information (contact person, phone number, fax, e-mail, etc.) to ensure AHMS can undertake this preferred method of communication;
5. Feedback on the proposed methods outlined above;
6. If you wish to be involved in any fieldwork, please nominate your proposed field representatives and ensure AHMS has your organisations insurances and daily rates;
7. Any protocols that you would like adopted during the project;
8. Identification of any Aboriginal objects of cultural significance and/or importance that you are aware of within the subject area, and how you wish them to be dealt with during the project;
9. Identification of any places of cultural significance and/or importance that you are aware of within the study area, and how you wish them to be dealt with during the project;
10. Guidance on the protocols, sensitivity, use and/or distribution of any cultural information that you provide AHMS;
11. Whether you require any further information prior to AHMS proceeding with the project.

We request that you provide this information by **20 July 2012** of the date of this letter. For further information, please contact Alan Williams on 02 9555 4000.

Yours sincerely

Alan Williams

Senior Archaeologist

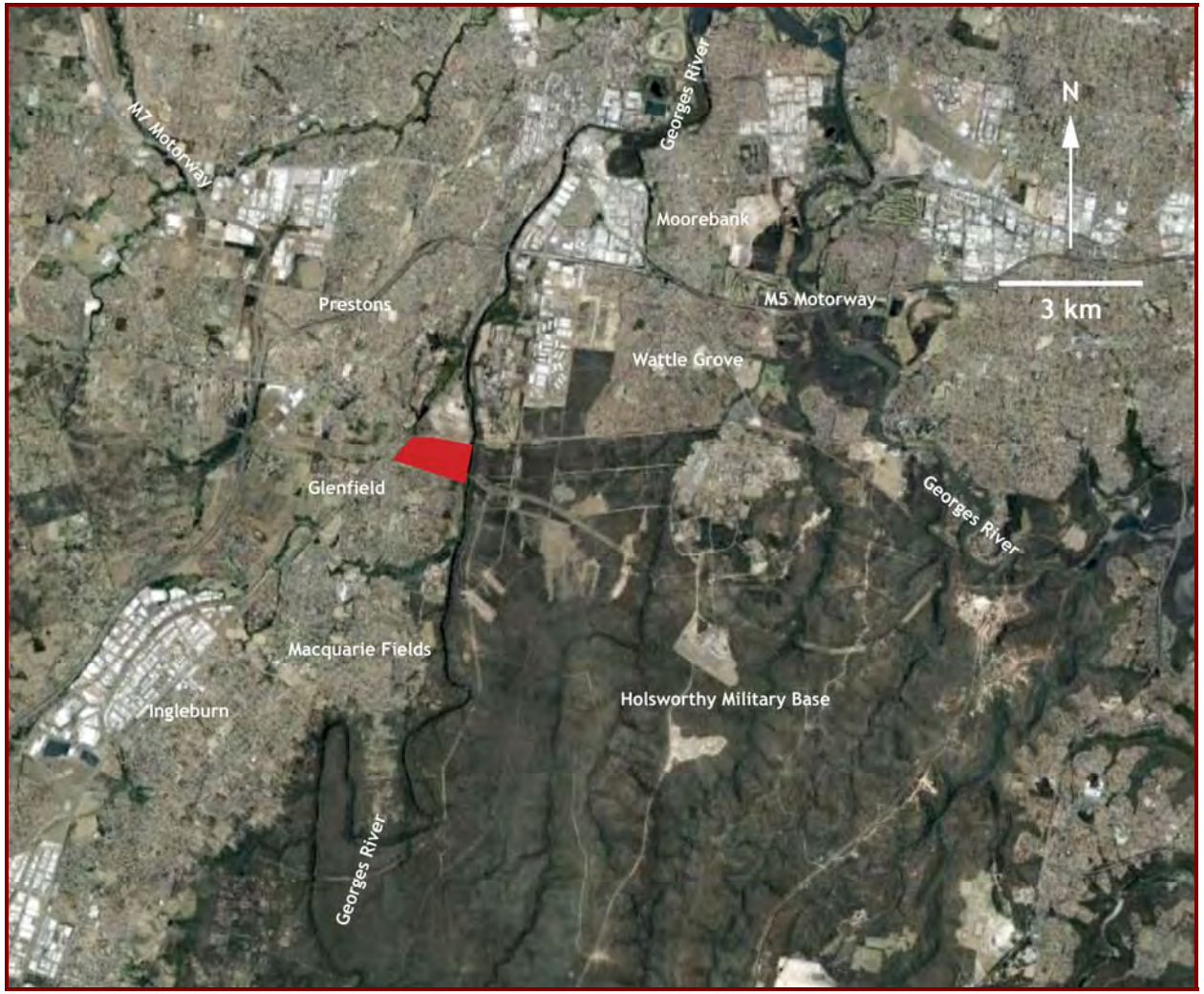

Figure 1. Location of Subject Area.

Figure 2. The proposed recycling development footprint (approximate).

Figure 3. Map of archaeological sites within the subject site. GWD 1 and Glenfield ST are potential scarred trees, Glenfield 1 is an isolated find, GWD 2 is a potential archaeological deposit. Existing disturbance is noted in red.

Appendix 1: AHMS 2012 Preliminary Assessment

Archaeological and Heritage Management Solutions Pty Ltd
349 Annandale St, Annandale, NSW 2038 **Phone** (02) 9555 4000 **Fax** (02) 9555 7005
Email info@arksolutions.com.au ACN:088 058 388 ABN: 45 088 058 388

DARUG CUSTODIAN ABORIGINAL

CORPORATION

PPO BOX 81 WINDSOR 2756

PH: 0245775181 FAX: 0245775098 MOB: 0415770163

ABN: 81935722930

mulgokiwi@bigpond.com

25th of June 2012

Attention: Alan Williams.

SUBJECT: Glenfield Waste Disposal – Aboriginal Cultural Heritage Assessment methodology.

Dear Alan,

The Darug Custodian Aboriginal Corporation have received and reviewed the Glenfield Waste disposal Aboriginal Cultural Heritage Assessment methodology.

This area is within the boundaries of the Darug language group (tribe) we support the proposed methodology.

Our nominated site officer for this project will be Leanne Watson or Justine Coplin or Alyce Mervin dependent on availability. Please direct all contact through Leanne Watson.

It is a main aim of our group to protect and care for Darug sites. Please contact us with all further enquiries on 0415770163 or mulgokiwi@bigpond.com

Regards

LWat

Leanne Watson

Darug Aboriginal Cultural Heritage Assessments

ABN 51734106483

Gordon Morton & Associates

Mob: 0422 865 831
Fax: 45 677 421

Celestine Everingham
90 Hermitage Rd., Kurrajong Hills, 2758
Ph/Fax: 45677 421
Mob: 0432 528 896

26 . 6 . 12

Attention:

Alan Williams

re Glenfield Waste Disposal, Glenfield, N.S.W.

DECCW have reviewed your methodology for the Glenfield Waste Disposal and we support your aims and objectives. DECCW wish to be involved in all fieldwork.

Yours Sincerely,
C. Everingham

APPENDIX 3: UTM Arboricultural Assessment of Glenfield ST and GWD 1

URBAN TREE MANAGEMENT

CONSULTING
ARBORICULTURISTS
& HORTICULTURISTS

Urban Tree Management
Australia Pty Ltd
ACN 098 599 805
ABN 56 098 599 805

65 Excelsior Street
Merrylands NSW 2160

Phone 02 9760 1389
Facsimile 02 9760 1102
admin@utma.com.au
www.utma.com.au

Accredited member of
INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS ®

REPORT:

ARBORICULTURAL ASSESSMENT
OF
Scarred Trees

AT
Glenfield Waste Disposal Services
Glenfield
New South Wales

FOR
Environmental Property Services
On behalf of
Glenfield Waste Services
Prepared 29 October 2012
Reference 15051

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Table 1.0 Summary of each tree with origin of wounding 3

Appendices

Appendix A **Sustainable Retention Index Value (SRIV) Version 4 (IACA 2010)**

Appendix B **References**

Appendix C **Glossary of terminology (IACA 2009)**

SUMMARY

This report was prepared for Environmental Property Services (EPS) and examines 2 live trees (*the trees*), summarized in Table 1.0, located within the southern portion of the Glenfield Waste Services site, Glenfield NSW (*the site*). The purpose of the report is to assist in determining whether the wounds on the trees are of *Aboriginal cultural* or *Non-Aboriginal cultural* origin. Based on the investigations detailed in this report the wounds on the trees are considered to be of Non-Aboriginal cultural origin.

Table 1.0 Summary of each tree with origin of wounding.

UTMA Tree No. & Archaeological No.	**Genus and species**	**Common name**	**1. Age range of tree** in yrs. approx. / **2. Age range of wound** in yrs. approx.	**Likely origin of wound/s**	**Photograph of tree**
Glenfield ST (#45-5-2428)	*Eucalyptus moluccana* Roxb.	Grey Box	**1.** >75 - <100 **2.** >25 - <40	1.1 Non -Aboriginal Cultural origin, borer insects damage or in combination with an abrasion impact event from steel cable fastened around base of trunk.	

Table 1.0 Summary of each tree with origin of wounding continued.

UTMA Tree No. & Archaeological No.	**Genus and species**	**Common name**	**1. Age range of tree** in yrs. approx. / **2. Age range of wound** in yrs. approx.	**Likely origin of wound/s**	**Photograph of tree**
GWD 1	*Eucalyptus tereticornis* Smith	Forest Red Gum	**1.** >75 - <100 **2.** >30 - <50	2.1 Non -Aboriginal Cultural origin, abrasion impact event.	

1.0 INTRODUCTION

Archaeological and Heritage Management Solutions (AHMS), was commissioned by Environmental Property Services for Glenfield Waste Services to undertake an Aboriginal Heritage Assessment of the site. Part of the assessment included a site visit by registered Aboriginal stakeholder groups. During the site visit the trees were identified as scarred trees possibly of Aboriginal cultural origin.

URBAN TREE MANAGEMENT © (UTMA) was engaged by EPS, Level 1, 19 Stockton Street, Nelson Bay NSW 2315 on behalf of Glenfield Waste Services to determine the following information for *the trees*: age of the trees, age of wounding event/s, likely causation of the wound, condition of *the trees*, possible remaining lifespan of the trees or risk to the life of *the trees* and the likelihood of the wounds on the trees being of *Aboriginal cultural or Non-Aboriginal cultural* origin. .

This report will be used to assist with the consultation with the registered Aboriginal stakeholder groups regarding the scarred trees.

Mr Danny Draper *(the author)* attended the site, on Wednesday 17 October 2012 and examined the trees, their growing environments and wounding. The dimensions of the trees wound/s were recorded and the wound/s photographed. The age of each tree provided is an estimate only and offered within a range due to the uncertainty of such unsubstantiated field observations without the application of Dendrochronology or other records. Without such precise data the age of trees are usually considered in stages of life span against their biomass *in situ* as Young (0-20%), Mature (20-80%) and Over-mature (senescent) (80-100%).

2.0 METHODOLOGY

The trees are identified in the AHMS Aboriginal Heritage Assessment report as Glenfield ST (#45-5-2428) and GWD 1. For ease of reference each tree has been assigned the AHMS reference number.

The inspection/s was undertaken by a visual assessment conducted from the ground and considers as part of the assessment/s of the remaining lifespan of a live tree or durability of the remains of a dead tree.

A glossary of terms is included as Appendix C covering the description of the tree/s.

Assessment of Trees

The following criteria were recorded to reflect the current status of the trees being: Age class, Condition class, Form class, Dimensions, Crown cover (live foliage as %), Crown density (density of live foliage evident as %), vigour class and Sustainable Retention Index Value (SRIV) version 4 (IACA, 2010) of each live tree (Appendix A), where appropriate.

The age of the trees was estimated from a sound professional knowledge or research of the individual tree taxa, growth of trees within the region based on habitat, rainfall, soil type and land use practices and considered against the dimensions of each tree encountered and the limitations of its growing environment *in situ*. A tree may be described in greater detail than others where it was considered appropriate to more accurately describe the location of the wound or the circumstances which may have led to its formation.

Assessment of Wounds to determine Archaeological status as Scarred Trees

As a tree grows vascular cambium as a thin layer of dynamic cells close to the surface produces xylem to form wood on the inner side, and phloem to form bark on the outer side. The cambium grows as a continuous ring and is laid down as fibres along the trunk, stems and roots when a new growth increment layer is developed. The vascular cambium translocates nutrients in solution through the fibres from the roots to the leaves through the xylem and sugars produced in the leaves as photosynthates through the phloem and ray cells and to the roots. Their structural importance allows for strength and flexibility as energy from loading forces from the trees mass and wind movement stimulates adaptive growth and reactive growth. The shape and form of a tree is affected as wind moves along stems from the distal to proximal end dissipating and diminishing through damping through the trunk and roots and out into the ground (James *et al* 2006, Mattheck & Breloer 1994, pp. 14-19).

When the vascular cambium is disrupted a wound occurs. If the vascular cambium is severed to a sufficient depth fibres above and below will become desiccated and die forming a wound with the extent of tissue dieback often unpredictable and extending beyond the initial point of wounding. The coating of live tissue allows for a uniform distribution of loading forces over the entire tree – the *axiom of uniform stress* (Mattheck & Breloer 1994, p. 183), with additional or less wood produced depending on loading forces of compression, tension, shear and torsion. The stimulus of wounding usually changes the distribution of loading forces and the growth responses from the tree which can manifest as altered growth patterns as the load bearing capacity of the tree is modified and the crown and growing conditions alter over the life of the tree. Such changes may be caused by shedding branches, hollowing from termites, fungal decay or fire, clearing of nearby trees increasing exposure to winds, branch shedding, further wounding, and root damage from excavation, soil cultivation or erosion.

When wounding occurs the trees biomechanics predispose it to attempt to restore the alignment of its fibres and to protect it from pathogens by the growth of new wood and to isolate the wound through 4 walls of defence as provided by (CODIT) Compartmentalization of Decay In Trees (Shigo 1989, p. 45) by chemically altering surrounding wood and walling off the damage using barriers provided by existing cellular structures as Walls 1-3 and finally to conceal the wound separating it from the damage caused at the time of wounding beneath layers of new wood as Wall 4. At the time of wounding Wall 1 is formed by plugging xylem vessels vertically above and below the wound. Wall 2 is formed tangentially in growth rings by the concentration of lignin in the cells of late season's growth acting to prevent the inward spread of pathogens. Wall 3 forms at the sides of the wound from ray cells producing toxins which limits spread laterally. Wall 4 is the new wood separating the initial wound site from new growth and forms the *wound margin*.

The sides of the wound are *wound margin left* and *wound margin right* which slowly converge and usually form an oblong, circular or elliptic shape (Draper and Richards 2009). The distal and proximal ends of a wound are the *wound apex* and *wound base* respectively and may be irregular, jagged, obtuse, rounded, truncate to acute ($<90^{O}$) where the margins converge often forming a wound seam or partial occlusion (Draper and Richards 2009). The wood exposed by the removal of the bark is the *wound face* although this may be absent if a void is evident as a *cavity* or a larger void as a *hollow* (Draper and Richards 2009).

No matter what the shape of the wound the tree will ultimately attempt to align the fibres to grow over and conceal the wound to restore the cover of living wood around and along the stem to return the stem to its structural optimum, capable of receiving a uniform stress loading (Mattheck and Breloer 1994, pp. 12-16). Ultimately most margins converge and graft to conceal the *wound face* and it is then that the tree has achieved wound *occlusion* (Draper and Richards 2009). The living tissue disrupted at the time of wounding will always die, remain damaged and continue to deteriorate even when a wound is occluded by successive growth rings because trees do not heal they can only conceal the damaged cells with consecutive layers formed by each seasons growth (Mattheck and Breloer 1994, pp. 12-16).

Wound margins encroach over the wound face as new growth ring increments are added around the tree. The *wound margin depth* on the left and right sides usually deepens over time before the wound is occluded and can be measured perpendicular from the wound face to the outer edge of the trunk, or from the outer edge of the trunk to the inner edge of the void if the wound face is absent (Draper and Richards 2009). It is not uncommon for the depth of the *wound margin right* and *wound margin left* or the distances from the *initial wound margin* to the *wound margin* to be different because of reactive growth stimulated by differential loading along the stem in compression, tension, torsion or shear stimulating more wood to be laid down on the side bearing the greatest load (Mattheck and Breloer 1994, pp. 12-16). Where margins are of a similar width and depth they are usually equally loaded or may both be neutrally loaded (Mattheck 2004, p. 17).

As the wound wood margins grow across the wound face from the point of initial wounding a general differentiation in the colour of bark and its texture from surrounding unwounded tissue will sometimes be evident and can assist to indicate the extent of the width of the wound and the approximate location or extent of the *initial wound margin* (Draper and Richards 2009). However this may become less apparent over time with wounds that have been *occluded* for long periods due to the successive growth increments added sometimes concealing the wound entirely, or on trees with thick bark.

By measuring the width of the wound between the left and right *initial wound margin* the diameter of the trunk at the time of wounding and the approximate age of the tree can be estimated. The location of a wound on a trunk is static although the diameter of the stem is increased circumferentially by rings as growth increments, hence the wound margins and wound occlusion. The circumference of the trunk and stems of large old trees increases with age and the layers may be slightly thinner over a radial distance where such growth has slowed, than for younger trees or where they are not stimulated by loading.

The trees in the area are expected to grow at a relatively medium pace due to an average rainfall of 867.7 mm as recorded at the nearby Liverpool (Whitlam Centre), collected from 1962-2001, Latitude: 33.93 °S Longitude: 150.91 °E, Elevation: 20 m (Australian Government Bureau of Meteorology 2012), approximately 4.5 km away.

To differentiate between *cultural scarring*, historical scarring, recent mechanical damage or natural causes, the following were considered:

1. Age class
2. Ease of access to the location of wounding
3. Tree and its dimensions at the time of wounding
4. Extent of wounding, its symmetry (symmetrical / asymmetrical)
5. Extent of growth around wound site since initial wounding whether tree alive/dead
6. Impact of that wounding on the tree since the wounding event
7. Land use history
8. Condition class
9. Vigour class
10. Influence of its growing environment and its constraints
11. Proximity to other trees, shape and growth habit
12. Crown form
13. Shading
14. Rainfall
15. Insect damage
16. Fire
17. Soil
18. Aspect
19. Slope
20. Drainage

3.0 TREE ASSESSMENT

3.1 Assessment of Tree/s – Tree - Glenfield ST (#45-5-2428)

Tree No. Glenfield ST (#45-5-2428) Genus & species Common Name	**1. Age Class** **Y** = Young **M** = Mature **O** = Over-mature (Senescent) **2. Age range of tree** in yrs. approx. **3. Age range of wound** in yrs. approx. 4. **Date range since tree died** in yrs. approx., e.g. died, cut down, ring-barked	**Condition** **G =** Good **F =** Fair **P =** Poor **D** = Dead	**Form** **D** = Dominant **C** = Co-dominant **I** = Intermediate **S** = Suppressed **F** = Forest **E** = Emergent	**Height** in metres approx. / **Crown spread** approx. length x breadth metres / **Crown spread orientation.**	**Trunk diameter** in mm @ 1.4m, or as stated / **Trunk diameter orientation**	**Crown cover / Crown density** approx. %	**SRIV** Age, Vigour, Condition / Index Rating App A. / Remaining life expectancy 1. Long 2. Medium 3. Short
Eucalyptus moluccana Roxb. Grey Box	1. M 2. 75 - <100 3.1 >25 - <40 4. N/A	P	F - D	16 Approx. 10, Radial	600x370, 485 Av, E/W	85 85	MGVP - 6 1

Description

E. moluccana Roxb. - Grey Box is a small to medium sized woodland and occasionally tall forest tree (Brooker and Kleinig 1999, p. 220), with crown spread 10-20 m and commonly attaining a height of 15-25 m (Elliot and Jones 1986, p. 149) to 20-30 m with a diameter 0.6-1.2 m DBH, straight trunk up to half or more the height (Boland *et al*, 2006, p. 240). Grey Box has a high green density (GD) approximately 1170 kg / m^3 and an air dry density (ADD) of 1120 kg/ m^3 heartwood very durable, sapwood occasionally attacked (Bootle 1985, p. 256) to resistant to *Lyctid borers,* heartwood very hard, termite-resistant, strong and very durable (Boland *et al*, 2006, p. 322), indicative gradual deterioration since wounding.

Trunk straight to 4.0 m approx., erect, crown deliquescent, comprised of 2 codominant first order structural branches (FOSB), orientation northeast/southwest; 1 superior to northeast, erect; 1 inferior to southwest acutely divergent and ascending, supporting approximately 70% and 30% of the live crown respectively. High volume dieback in mid-upper crown comprised of small and large deadwood as mature epicormic shoots and third and lower order branches. Trunk wound on west side of trunk and soil levels increased around base of trees approximately 100-150 mm above grade. Steel cable fastened around base of trunk, largely concealed by soil and plant material.

Wound 1

Trunk wound extending below grade 100-150 mm (excavated), narrow linear, symmetrical, located on west side of trunk. Wound extending from -150 – 3450 mm (3600 mm long) and 400 mm approximately at widest at 800 mm. Wound face extending from -20 – 3220 mm (3240 mm long) and 200 mm at widest at 800 mm. Margins entire, apex and base rounded. Depth of margins: right 75-85 mm proximal-distal and left 20-50 mm proximal-distal. Width of margins: right 130 mm approximately and left 90 mm approximately.

Small occluded trunk wound 120 x 90 mm located 100 mm below grade below left wound margin (Photographs 1.3 and 1.4). This wound is unlikely to be from lightning as no substantial wounding in the crown is evident, although the basal wound is consistent with the Earthing of a lightening discharge.

The impact of the intensity of lightning strikes can vary between trees. The structural damage is derived primarily from a short distance, short duration, intense, strong shock wave radiating from the lightning core and additional damage as green tissue is superheated and by steam venting, a significant cause of damage to roots (Coder 2007). The lightning charge path follows the internal grain of a tree in the vascular cambium which has a lower resistance to the flow of electricity when compared to the outside of the bark and leaves even when wet (Coder 2007). In the outer crown thin branches and leaves have reduced electrical resistance and the charge moves internally along the fibres and through the cambium but as the charge builds the flow of current cannot be sustained and a flash-over to the surface starts and follows the grain of the xylem and builds to form a shock wave from atmospheric heating against the trunk, forming an intense compression against the bark and inner wood and a rebounding torsion wave around the trunk (Coder 2007) causing massive damage and delignification. This can be intensified when multiple strokes in a single lightning strike generate multiple shock waves (Taylor 1977).

Here the tree is expected to have been young when such a strike may have occurred, but the tree would have likely caught on fire or since decayed being much smaller than present. The final indicator that the small, occluded, basal wound was not caused by lightening is that the vascular cambium was damaged by longicorn borers prior to the development of the basal wound and the disrupted tissue dried out preventing the internal flow of the electrical discharge. The wound is likely an occluded abrasion impact event from the movement of the steel cables against the trunk, but the full extent of such damage is unknown.

Wound face entire to heartwood with patches of remnant sapwood, proximal, adjacent left wound margin and wound base (see Photographs 1.1 and 1.2). Minimal weathering as delignification of the heartwood with Longicorn borer (order *Cerambycidae*), where larvae have disrupted the vascular cambium and sapwood by feeding and then burrowing into the heartwood (Creffield 1996) to pupate causing the broader linear, shallow concave depressions evident (see Photographs 1.1 and 1.2). The disrupted tissue desiccates and dies back causing the extent of the lesion distally. Termite mud evident adjacent the left wound margin and wound face and protruding from exposed ray cells as linear vertical cracks, concentrated from mid-top of wound face.

E. moluccana Roxb. Grey Box has a high green density of 1170 kg / m^3 and is strong and moderately durable, not susceptible to *Lyctus* or termite attack (Bootle 1985, p. 256) indicative of its gradual weathering since wounding. However, the wounding is likely to be recent accounting for minimal wreathing of the heartwood generally although it may have been protected by the weaker sapwood which has almost completely weathered away with only shallow fragmented patches evident (Photographs 1.1 and 1.2). The specimen is small and likely regrowth since the cessation of agricultural activities, whereas older specimens can be expected of much larger dimensions. This wound is expected to have affected approximately 10-15% of trunk *in situ*. The wound is expected to be >25-<40 years old. From the dimensions and age of the tree in early maturity, depth of its margins, minimal weathering of durable heartwood as minor delignification and the remains of some sapwood with insect borer damage extending to heartwood, the wound is likely to be of Non-Aboriginal cultural origin and caused by borer insects or in combination with an abrasion event from the steel cable.

Risks to tree

Damage from fire, fungal decay, physical damage and from abrasion or collision impacts.

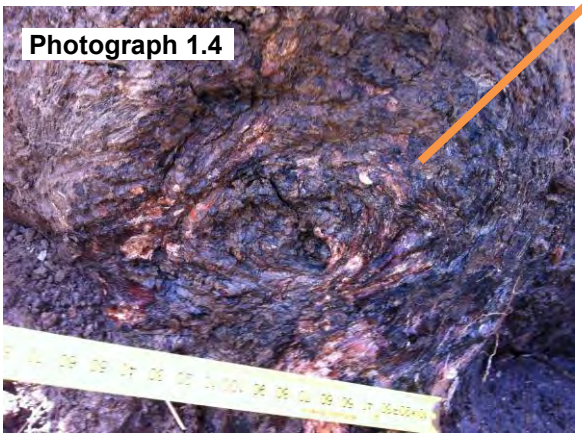
Photograph 1.0

Photograph 1.1

Photograph 1.2

Photograph 1.3

Photograph 1.4



Photograph 1.0 taken by Danny Draper. View to east of Tree Glenfield ST (#45-5-2428) *Eucalyptus moluccana* Roxb. – Grey Box, with bold arrow showing location of wound on west side of trunk.

Photograph 1.1 View to east of Tree Glenfield ST (#45-5-2428) with trunk wound shown with a folding ruler extended to 1 m. Red brace indicates area of remnant sapwood, proximal, adjacent left wound margin and wound base, shown in greater detail in Photograph 1.2.

Photograph 1.2 View to east of Tree Glenfield ST (#45-5-2428)- with detail of remnant sapwood, proximal, adjacent left wound margin and base with bold orange arrows showing the remnants of Longicorn borer (order *Cerambycidae*), where larvae have disrupted the vascular cambium and sapwood by feeding and then burrowing into the heartwood to pupate causing the broader linear, shallow concave depressions evident. The disrupted tissue dies back causing the extent of lesion distally.

Photograph 1.3 View to east of Tree Glenfield ST (#45-5-2428)- with trunk wound base, shown excavated to 150 mm below grade with a folding ruler extended to 250 mm (horizontally) above steel cable fastened around trunk. Red brace indicates occluded wound margin from damaged root or abrasion wound on trunk, not likely to be from lightening.

Photograph 1.4 Occluded wound margin 100 mm below grade, shown with retractable ruler extended to 170 mm. Elongated wound distally, expected to be caused by Longicorn Borers or in combination with abrasion as partial ring barking by steel cable causing dieback of vascular cambium extending above point of initial vascular cambium disruption.

3.1 Assessment of Tree/s – Tree GWD 1 -

Tree No. GWD 1 Genus & species Common Name	**1. Age Class** **Y** = Young **M** = Mature **O** = Over-mature (Senescent) **2. Age range of tree** in yrs. approx. **3. Age range of wound** in yrs. approx. 4. **Date range since tree died** in yrs. approx., e.g. died, cut down, ring-barked	**Condition** **G =** Good **F =** Fair **P =** Poor **D** = Dead	**Form** **D** = Dominant **C** = Co-dominant **I** = Intermediate **S** = Suppressed **F** = Forest **E** = Emergent	**Height** in metres approx. / **Crown spread** approx. length x breadth metres / **Crown spread orientation.**	**Trunk diameter** in mm @ 1.4m, or as stated / **Trunk diameter orientation**	**Crown cover / Crown density** approx. %	**SRIV** Age, Vigour, Condition / Index Rating App A. / Remaining life expectancy 1. Long 2. Medium 3. Short
Eucalyptus tereticornis Smith Forest Red Gum	1. M 2. >75 - <100 3.1 >30 - <50 4. N/A	P	I - D	16 Approx. / 12x8, E/W	800x850, 825 Av, NNE/SSW	70 75	MGVP - 6 1

Description

E. tereticornis Smith – Forest Red Gum is a small to medium sized to tall woodland or forest tree (Brooker and Kleinig 1999, p. 101) with crown spread 10-25 m and commonly attaining a height of 20-30 m (Elliot and Jones 1986, p. 222) to 20-50 m with a diameter up to 2.0 m DBH, straight trunk up to half or more the height (Boland *et al*, 2006, p. 322). Forest Red Gum has a high green density (GD) of 1200 kg / m^3 and an air dry density (ADD) of 1050 kg/ m^3 heartwood durable, sapwood occasionally attacked by *Lyctid borers* (Bootle 1985, p. 281), heartwood hard, strong and durable (Boland *et al*, 2006, p. 322), indicative gradual deterioration since wounding.

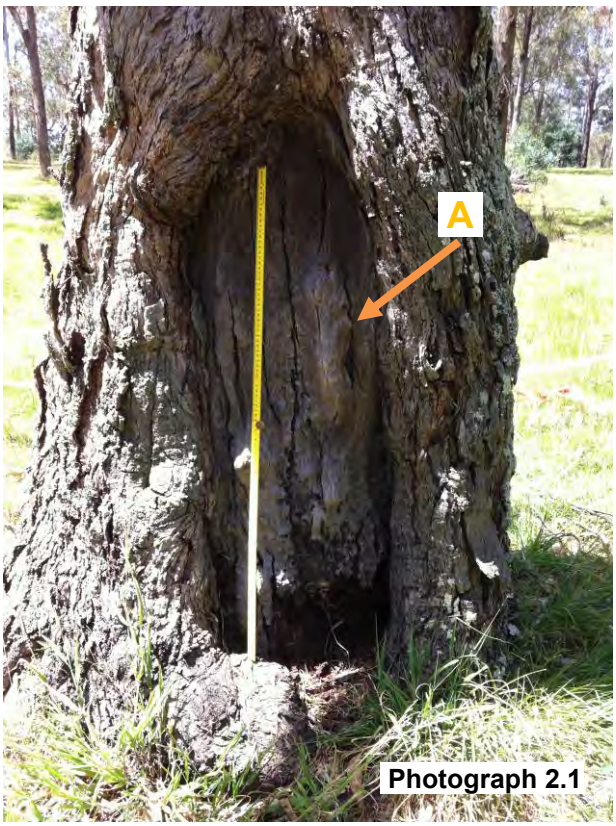
Wound 1

Basal wound, oval–rectangular, symmetrical, on northwest side of trunk. Wound extending from ground to 1600 mm and 600 mm at widest at 1100 mm. Wound face extending from 250-1350 mm and 390 mm at widest at 1100 mm (see Photograph 2.1). Wound margins entire, save for base, apex rounded, and base extending to ground along right wound margin. Wound face entire save for disrupted base adjacent right margin extending to decayed heartwood where a cavity is forming. At approximately 600 mm a 280 mm long protuberance, 20 mm high and 25 mm wide was evident extending from the wound face (Photographs 2.1 and 2.2) and likely making the bark unsuitable for an Aboriginal artifact, whereas smooth bark is more traditionally extracted. Adjacent the left side of the wound face (Photographs 2.1 and 2.2) remains of epicormic strands (Burrows 2002) as spike like protuberances 10-15 x 20 mm were evident, formed by bud primordia in the pith extending to the sapwood. Here negligible weathering as delignification has occurred from the sap wood or the fine points from the epicormic strands, indicative of a recent wounding event. Depth of margins: right 110-140 mm proximal-distal and left 190-170 mm proximal-distal. Width of margins: right 100 mm approximately and left 120 mm approximately.

This wound is expected to have affected approximately 10-15% of trunk circumference *in situ* and is expected to be approximately >30 - <50 years old. The specimen is small and likely regrowth since the cessation of agricultural activities, whereas older specimens can be expected of much larger dimensions. With minimum weathering of the sapwood and weathering extending to the heartwood this is indicative of an initial abrasion impact event causing localized partial delamination of the bark, allowing decay and subsequent activities of animals from foraging or seeking shelter to exploit the cavity and to exacerbate its extension over time. Due to the likely young age of the tree when the wounding occurred, the subsequent minimal weathering of the wound face and vigorous wound wood development as margins and partial occlusion, the scar appears to be of Non-Aboriginal cultural origin.

Risks to tree

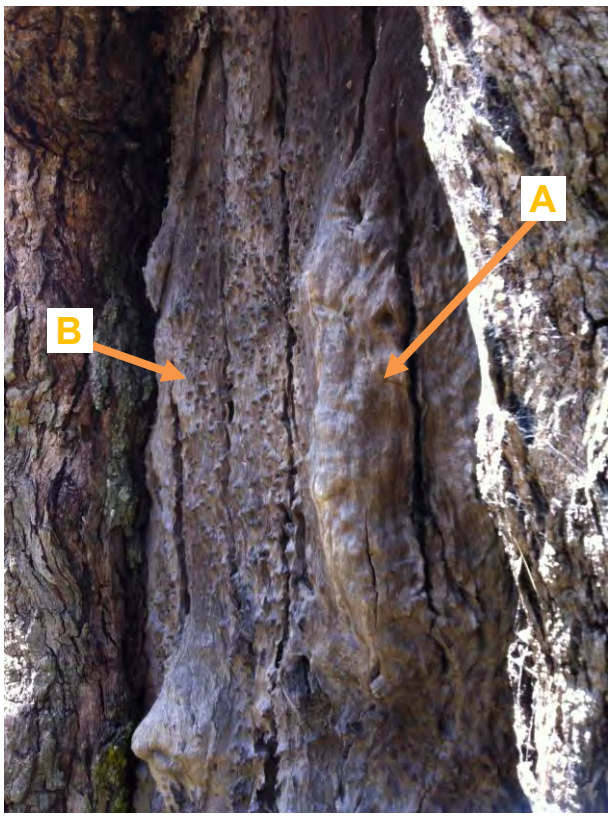
Damage from fire, fungal decay, physical damage and from abrasion or collision impacts.



Photograph 2.0 taken by Danny Draper. View to southeast of Tree GWD 1- *Eucalyptus tereticornis* Smith – Forest Red Gum, Wound 1, with trunk wound shown with a folding ruler extended to 1 m.

Photograph 2.1 taken by Danny Draper. View to southeast of Wound 1, with trunk wound shown with a folding ruler extended to 1 m. Right wound margin extending to ground as wound base and structural root. Right wound margin extends to ground where decay has occurred. Linear protuberance on upper wound face (right) marked '**A**', indicated by bold arrow, shown in greater detail in Photograph 2.2.

Photograph 2.2 taken by Danny Draper. View to southeast of Wound 1 (detail), '**A**' showing 280 mm long protuberance, indicative of the wrinkled and likely unsuitable nature of the bark for an Aboriginal artifact, whereas smooth bark is usually used. '**B**' shows an area Epicormic Strands as spike like protuberances formed by bud primordia in the pith extending to the sapwood. Here negligible weathering as delignification of the sap wood has occurred, indicative of recent wounding event.



Photograph 2.2

4.0 CONCLUSION

4.1 This is provided in table form and summarizes the key information.

UTMA Tree No. & **Archaeological No.**	Age of Tree **Age range of tree** in yrs. approx.	Age of Scar **Age range of wound** in yrs. approx.	Likely cause of Scar
Glenfield ST (#45-5-2428)	>75 - <100	1) >25 - <40	1) Non-Aboriginal cultural origin, borer insect damage or in combination with an abrasion impact event from steel cable fastened around base of trunk.
GWD 1	>75 - <100	2) >30 - <50	2) Non-Aboriginal cultural origin, an abrasion impact event.

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Appendix A

Matrix - Sustainable Retention Index Value (SRIV) ©

Version 4, 2010
Developed by IACA – Institute of Australian Consulting Arboriculturists www.iaca.org.au

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition.
An index value is given to each category where ten (10) is the highest value.

Age Class	Vigour Class and Condition Class					
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.
(Y) Young	**YGVG - 9** **Index Value 9** Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.	**YGVF - 8** **Index Value 8** Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.	**YGVP - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVG - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.	**YLVF - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVP - 1** **Index Value 1** Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability.
(M) Mature	**MGVG - 10** **Index Value 10** Retention potential - Medium - Long Term.	**MGVF - 9** **Index Value 9** Retention potential - Medium Term. Potential for longer with improved growing conditions.	**MGVP - 6** **Index Value 6** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVG - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVF - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVP - 2** **Index Value 2** Retention potential - Likely to be removed immediately or retained for Short Term.
(O) Over-mature	**OGVG - 6** **Index Value 6** Retention potential - Medium - Long Term.	**OGVF - 5** **Index Value 5** Retention potential - Medium Term.	**OGVP - 4** **Index Value 4** Retention potential - Short Term.	**OLVG - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions.	**OLVF - 2** **Index Value 2** Retention potential - Short Term.	**OLVP - 0** **Index Value 0** Retention potential - Likely to be removed immediately or retained for Short Term.

Appendix B

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Appendix C

Glossary

From
Dictionary for Managing Trees in Urban Environments
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Wounds

Abrasion Wound *Mechanical wound* causing *laceration* of tissue by an abrasive impact *episode* e.g. grazed by a motor vehicle or the continuous action of the rubbing of *crossed branches* or stems where no graft has formed.

Basal Trunk Wound A wound on the trunk extending to the *root crown* where the base of the wound is open at the ground and usually truncated. Dependant upon the width of its base such a wound may not become *occluded*.

Blaze A wound cut into a tree usually to the sapwood and sometimes extending to heartwood to create a marker point e.g. by a surveyor, the *wound face* may be further incised or painted to denote additional information.

Branch Tear *See Branch Tear Out.*

Branch Tear Out Dislodging of a branch from its point of attachment where it is torn away from the *branch collar* snapping the *branch tail* causing a *laceration*, usually to the underside of the *branch union* of the branch or trunk to which it was attached forming a *tear out wound*.

Branch Tear Wound *See Tear Out Wound.*

Callus Wood Undifferentiated and unlignified wood that forms initially after wounding around the margins of a wound separating damaged existing wood from the later forming lignified wood or *wound wood*.

Canker A *wound* created by repeated localised killing of the *vascular cambium* and bark by wood *decay* fungi and bacterium usually marked by concentric disfiguration. The wound may appear as a depression as each successive *growth increment* develops around the *lesion* forming a *wound margin* (Shigo 1991, p. 140, Keane *et al* 2000, p. 332).

Cavity A usually shallow void often localized initiated by a *wound* and subsequent *decay* within the trunk, branches or roots, or beneath bark, and may be enclosed or have one or more opening.

Decay Process of degradation of wood by microorganisms (Australian Standard 2007, p. 6) and fungus.

Delaminate A *mechanical wound* caused when the bark is stripped from a tree, usually from the trunk as a continuous sheet back to the vascular cambium. This may occur from an impact or abrasion *episode* such as a collision with a motor vehicle and the tree may become *ringbarked*. See also *Partially Delaminated*.

Delamination The separation of fibres often evident as longitudinal splitting of wood (Lonsdale 1999, p. 313).

Delignification The decomposition of *lignin* from *wood* by chemical deterioration, resulting in loss of strength, evident by separation of fibres into hair like strands. See also *Lignification*.

Depth of Margin Distance from outer trunk perpendicular to the *wound face*. This may assist in determining the age of a wound.

Dieback Wound Wounding where *dieback* extends beyond a branch collar as with *natural pruning* and extends to other branches, trunk or roots. See also *Secondary Crown* and *Stag-headed*.

Enclosed Wound Wound with a perimeter of *wound wood* with a well-defined apex, base and margins and often evident on an older wound. On a pruned branch that is rounded the enclosing wound wood from the branch collar may be circular with no definite apex or base evident. However, on a pruned branch where the *wound face* is oval in shape due to *reaction wood*, the enclosing *wound wood* from the branch collar may form a definite apex, base or margins.

Environmental Wounding/Damage Wounding inflicted by environmental factors or modifications to the growing *environment* of a tree, e.g. sun-scald, drought, fire, water logging, wind damage to leaves, branches, bark or roots, phytotoxic damage from chemicals, or air, soil or water pollution.

Fire Wound Wounding caused by fire. Such wounds may cause initial damage or may be secondary from a previous wounding *episode*/s. Some fire damage may be superficial or may destroy a tree in full or part rendering it potentially vulnerable to failure. Note: fire damaged trees can be potentially hazardous and should be assessed carefully.

Frilling *Ringbarking* by steel hatchet or axe as a continuous band of overlapping linear lacerations around a stem or trunk, where cleaved sections may be opened by the wedged blade giving a frilled appearance. Also a discontinuous line of linear lacerations made around the stem of a live tree or shrub weed for the application and uptake of herbicide.

Hollow A large void initiated by a *wound* forming a *cavity* in the trunk, branches or roots and usually increased over time by *decay* or other contributing factors, e.g. fire, or fauna such as birds or insects e.g. ants or termites. A hollow can be categorized as an *Ascending Hollow* or a *Descending Hollow*.

Horizontal Wound Usually superficial horizontal wounding from insects burrowing between bark layers and revealed by decorticating bark. Often evident on smooth bark Eucalypts.

Impact Wound *Mechanical wound* caused by an impact *episode* e.g. collision by a motor vehicle.

Incision Wound caused by cutting or engraving. See also *Laceration*.

Increment strip A linear, usually narrow, *fluted* section of *adaptive wood,* forming in a place of high *stress* indicating the pattern of *force flow* (Mattheck 2004, p. 140). Evident as lighter coloured bark usually occurring around the edges of a *notch* or *branch stub*, along a *buttress*, or along a *sharp-edged rib*.

Initial Wound Margin The site of initial wounding often evident as a faint line of discoloured bark or bark of a different texture to adjacent undamaged trunk. This may assist in determining the age of a wound.

Insect Wound Wounding to any part of a tree caused by insect activity, e.g. borers and termites.

Laceration Wound caused by tearing. See also *Incision*.

Lightning Strike Wound A wound from a lightning strike. Such a wound may kill a tree outright or cause it to catch fire, or may destroy the tree in full or part, or no injury may be evident and a tree gradually declines through resulting *stress*. Bark may be exploded from the tree by pressure radiating from the core of the lightning path resulting in further compounded damage through water heating and steam explosions in the tissues and the electrical disruption of living cells (Coder 2004, pp. 35-44).

Mechanical Wound Wounding inflicted by abrasion e.g. by motor vehicles, grass mowing equipment, grazing by horses, cows or birds (parrots); impact e.g. by motor vehicle collisions; drilling e.g. with increment cores, resistographs, cable bracing, hanging pots, hammocks etc.; branch tearing e.g. from wind damage, collision from falling branches, vandalism; and root severance e.g. root pruning for excavation for building or utility services or for agricultural cultivation.

Open Wound Wound with poor to non-existent perimeter or *callus wood* or *wound wood* on an older wound without well-defined apex, base or margins and often this will be associated with a recent wounding *episode* or an older episode on a senescent tree or a tree in *poor condition* or of *low vigour*, or where repeated wounding episodes such as inflicted by ongoing borer activity damages and continually alters wound perimeters, or repeated scalping of exposed roots by lawn mowing equipment.

Occlusion Growth processes where *wound wood* develops to enclose the *wound face* by the merging of *wound margins* concealing the *wound* and restoring the growing surface of the structure with each *growth increment* gradually realigning *fibres* in the wood longitudinally along the stem to maximise uniform stress loading. See also *Axiom of Uniform Stress*.

Occlusion Seam A line of *included bark* where the interface of merging *wound margins* is *occluded* or forms a *partial occlusion*.

Partial Occlusion *Wound wood* growth that encloses some of the *wound face* by the merging and *grafting* of some sections of the *wound margins.* Usually evident by reduced *wound face* width and indicated where an *apex* or *base* is *acute* with the vertical extent often indicated by the length of an *occlusion seam*.

Partially Bridged Occlusion *Wound wood* partly forming an *occlusion* by joining areas of the *wound margins* across the *wound face* at point/s other than the base or apex and may form an *occlusion seam*.

Pruning Wound A wound created by the act of *pruning*.

Ram's Horning *Wound wood* that becomes curled inward and can wrap around itself as it crosses a void such as a *cavity* and may succumb to cracking with those wounds susceptible to further infestation by *decay* pathogens.

Scarred Tree A tree containing a wound of cultural or scientific interest, inflicted initially for a specific purpose, e.g. by indigenous people to extract implements or carved as a marker or with a pattern for ceremonial purposes, or as a marker and *blaze* by a surveyor or explorer, or from an accidental *wound* that has not *occluded*.

Stepped Incision A localised area of deeper wounding often extending to the heartwood, usually proximally within a *blaze*, removing a vertical semi-circular wedge like section from the *wound face* with a horizontal bench like structure formed by deep cuts as its base. Such wound sections usually taper distally and may be cut around the outer edges to assist removal of the semi-circular wedge, and likely undertaken to inhibit regrowth.

Structural Wound Any wound occurring on a tree as a result of a structural failure e.g. branch splitting or *hazard beam*, diminishing its stability in full or part.

Succession Wound Preceding layers of failed wound margin/s forming a step like sequence away from the *wound face*, where present, to the current wound margin/s indicating repeated cycles of formation and failure of *CODIT Wall 4*.

Sun Scald Wounding usually on the upper side of branches after sudden exposure to sunlight especially in summer e.g. after excessive pruning of the upper crown, or following storm damage stripping foliage or branches e.g. *Ficus spp.*

Survey Marker Wound *See Blaze.*

Tear Out *See Branch Tear Out.*

Tear Out Wound A wound of usually concave shape created by a *branch tear out*.

Wound Damage inflicted upon a tree through injury to its living cells, from biotic or abiotic causes, e.g. where *vascular cambium* has been damaged by branch breakage, impact or insect attack. Some wounds *decay* and cause *structural deterioration* or *defects*. Trees of *normal vigour* are able to resist and contain infection by walling off areas within the wood by *compartmentalization*. See *Compartmentalization Of Decay In Trees (CODIT)*. An *occlusion* may eventually conceal a wound but the enclosed *defect* remains internally and *decay* may continue to develop further weakening the *heartwood* and *sapwood* compromising the tree's *structural integrity*. The cause of a wound may be accidental e.g. *branch tear out* or deliberate e.g. *carved tree*.

Wound Apex The distal end of a wound. The shape may be acute, irregular, jagged, obtuse, rounded, or truncate.

Wound Apex Acute Apex of a wound that is tapering and the *occlusion* interface angle is less than $<90^{O}$.

Wound Apex Irregular The *wound wood* growth at the apex mostly interrupted forming an edge that is not uniform or jagged. Often this may be influenced by a *successional wound* resulting in disproportionate development of *callous wood* and *wound wood.*

Wound Apex Jagged The *wound wood* growth or tissue damaged initially at the apex that is uneven and likely to have been caused by laceration.

Wound Apex Obtuse Apex of a wound that is tapering and the *occlusion* interface angle is greater than >90^{O}.

Wound Apex Rounded The *wound wood* growth at the apex that is curved.

Wound Apex Truncate The *wound wood* growth or tissue damaged initially at the apex that is even and likely to have been caused by incision.

Wound Base The proximal end of a wound. The shape may be acute, irregular, jagged, obtuse, rounded, or truncate.

Wound Base Acute Base of wound that is tapering and the *occlusion* interface angle is less than <90^{O}.

Wound Base Irregular The *wound wood* growth at the base mostly interrupted forming an edge that is not uniform or jagged. Often this may be influenced by a *successional wound* resulting in disproportionate development of *callous wood* and *wound wood.*

Wound Base Jagged The *wound wood* growth or tissue damaged initially at the base that is uneven and likely to have been caused by laceration.

Wound Base Obtuse Base of wound that is tapering and the *occlusion* interface angle is greater than >90^{O}.

Wound Base Rounded The *wound wood* growth at the base that is curved.

Wound Base Truncate The *wound wood* growth or tissue damaged initially at the base that is even and likely to have been caused by incision.

Wound Face Surface area of tissue exposed by injury, e.g. bark, sapwood, heartwood.

Wound Face Cracks Horizontal Transverse cracks in a *wound face* indicative of failure from *tension* force (Mattheck & Breloer 1994, p. 183).

Wound Face Cracks Vertical Longitudinal cracks in a *wound face* indicative of failure from *compression* force (Mattheck & Breloer 1994, p. 183).

Wound Face Entire Surface of exposed tissue is uniform without damage extending to a different layer or unaffected by borers or decay, e.g. possibly described as *wound face* entire to dead sapwood.

Wound Face Incomplete Surface of exposed tissue is not uniform with damage extending to different layers or affected by borers or decay, e.g. possibly described as *wound face incomplete* with cavity at apex. See also *Wound face entire*.

Wound Face Exposed Heartwood Wound extending to reveal the *heartwood*, or has deteriorated through *decay* to reveal this layer of wood.

Wound Face Exposed Sapwood Wound extending to reveal the sapwood, or has deteriorated through *decay* to reveal this layer of wood.

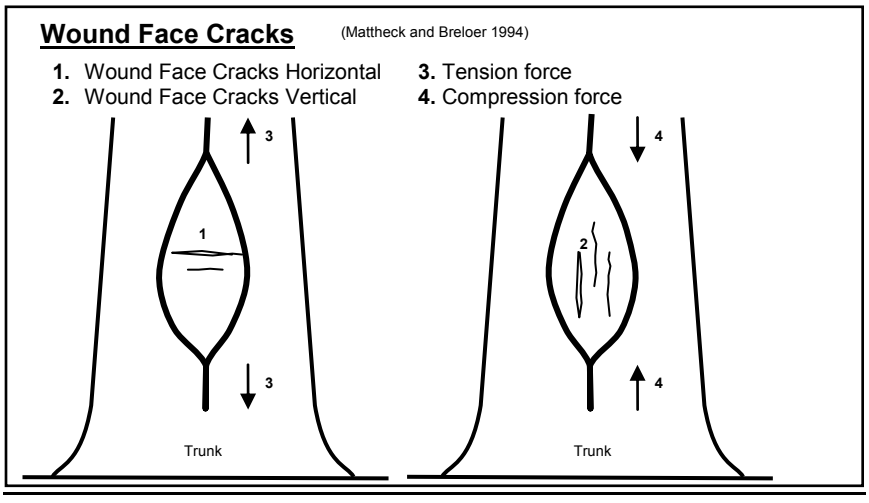
Wound Margin The left and right sides of a *wound* as bound by the alignment of fibres along a stem or root longitudinally, being either the remaining undamaged living cells and new *callus wood* and *wound wood* on older wounds. Here the fibres are usually formed from *meristematic* cells. A wound margin may be circular on a *pruning wound* or form around the perimeter of a *canker*.

Wound Margin Entire The *wound wood* growth in the margin is mostly uninterrupted forming a uniform edge.

Wound Margin Irregular The *wound wood* growth in the margin is mostly interrupted and forms an edge that is not uniform e.g. where repeated wounding *episode*s such as inflicted by ongoing borer activity damages and continually alters the *wound perimeter* with *callus wood* and *wound wood*. See also *Successional Wound*.

Wound Margin Left The left side of a wound margin when the distal and proximal ends of the wound is known, to determine the *wound apex* and *wound base*, respectively.

Wound Margin Right The right side of a wound margin when the distal and proximal end of the wound is known, to determine the *wound apex* and wound base, respectively.



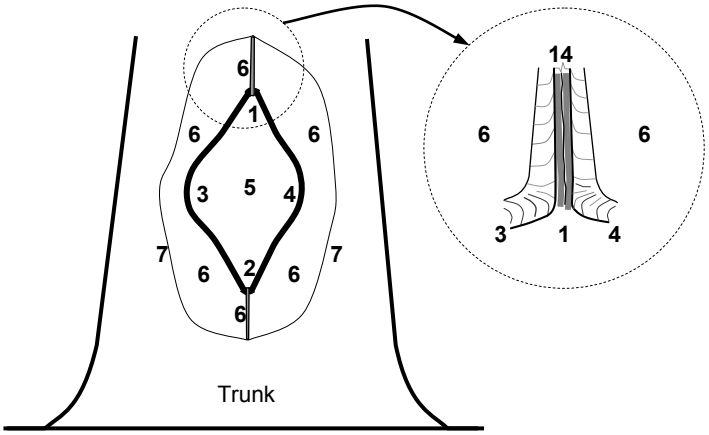
Wound Margin Width Distance from *wound margin* to the site of initial wounding. Where evident the *initial wound margin* may be identified by discoloured bark or bark of a different texture to adjacent undamaged trunk. This may also assist in determining the age of a wound.

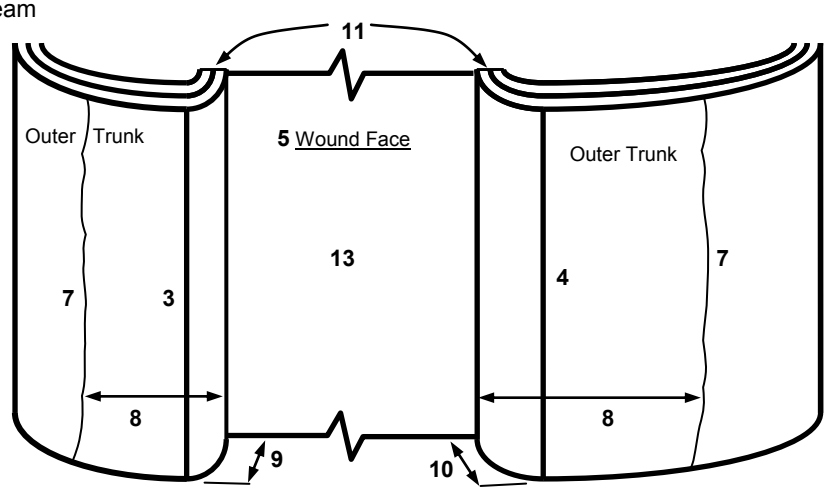
Wound Wood Aged *callus wood* around the margins of a wound that becomes differentiated to form *CODIT Wall 4* producing new lignified wood. This wood may grow to surround a wound and may eventually develop to enclose the wound by *occlusion*.

Wound Diagrams

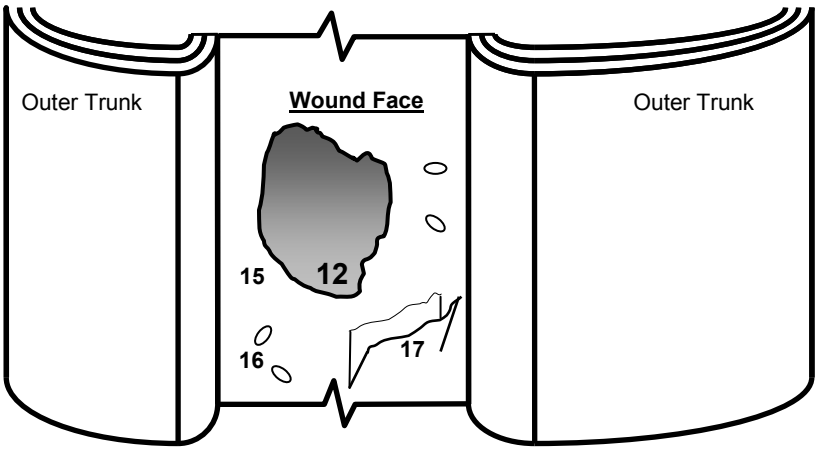
Wound Parts

1. Apex
2. Base
3. Wound Margin Left
4. Wound Margin Right
5. Wound Face
6. Partial Occlusion
7. Initial Wound Margin
8. Margin Width
9. Left Margin Depth
10. Right Margin Depth
11. Wound Wood
12. Cavity
13. Wound Face Entire
14. Occlusion Seam



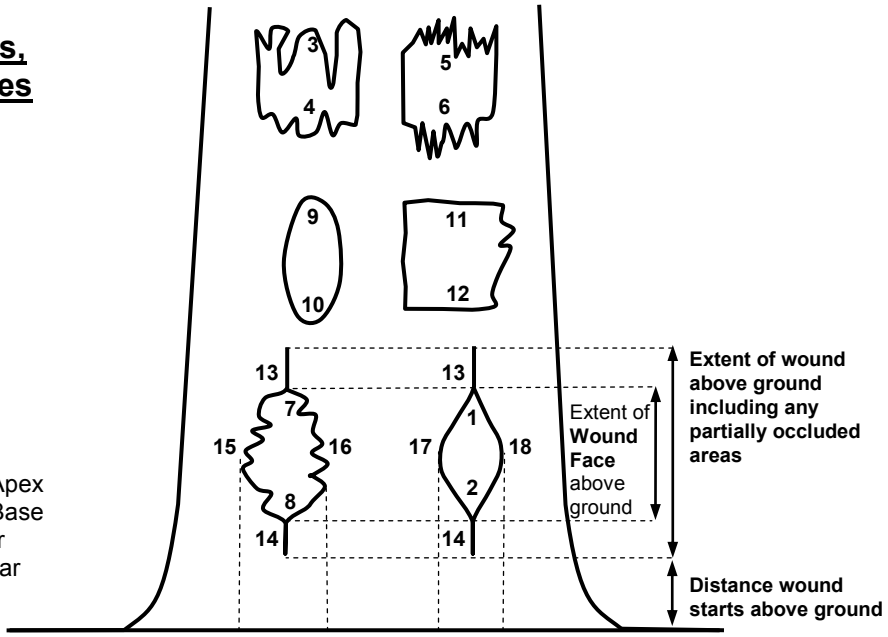


Examples of other Wound Faces
15. Wound face extending from dead sapwood to cavity in heartwood.
16. Oval shaped borer exit holes evident indicative of Longicorn Borer (Family Cerambycidae).
17. Linear laceration as made by an axe.



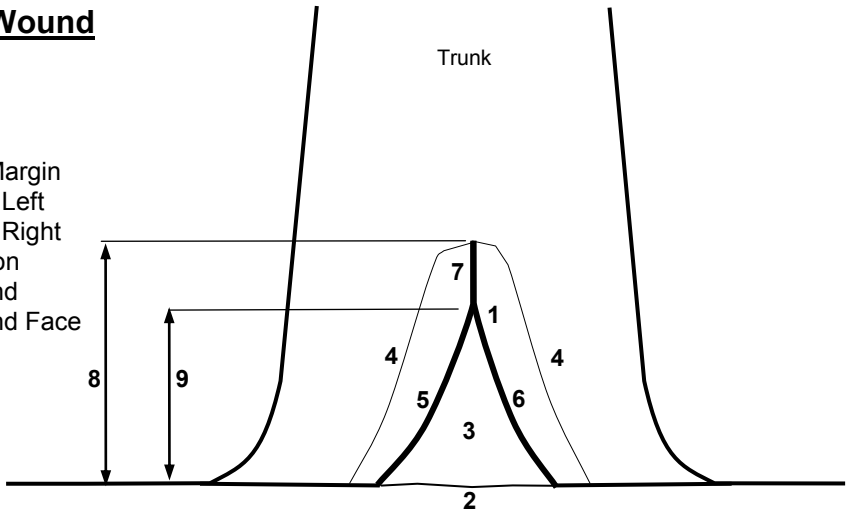
Wounds, Margins, Apexes and Bases

1. Apex Acute
2. Base Acute
3. Apex Irregular
4. Base Irregular
5. Apex Jagged
6. Base Jagged
7. Apex Obtuse
8. Base Obtuse
9. Apex Rounded
10. Base Rounded
11. Apex Truncate
12. Base Truncate
13. Partially Occluded Apex
14. Partially Occluded Base
15. Left Margin Irregular
16. Right Margin Irregular
17. Left Margin Entire
18. Right Margin Entire



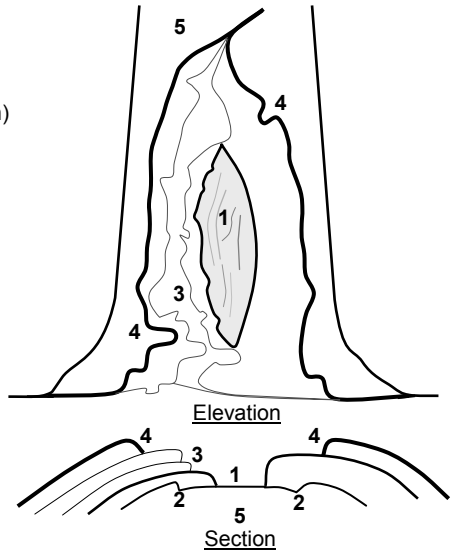
Basal Trunk Wound

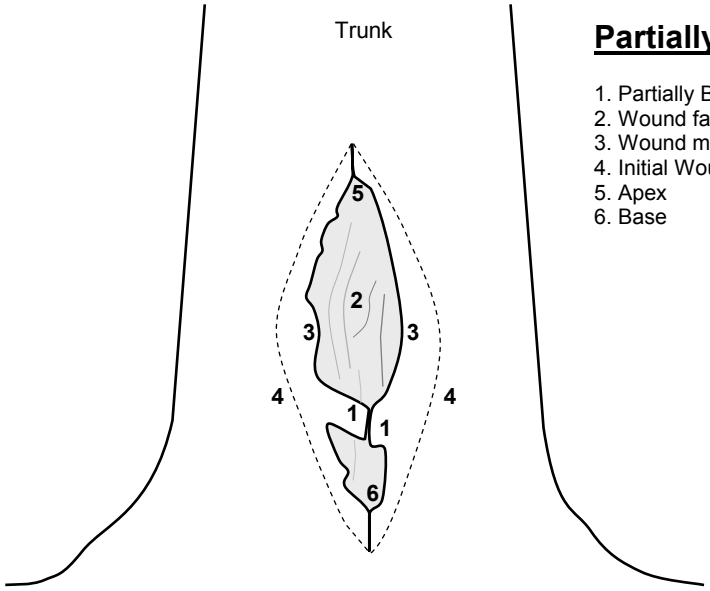
1. Apex
2. Base
3. Wound Face
4. Initial Wound Margin
5. Wound Margin Left
6. Wound Margin Right
7. Partial Occlusion
8. Extent of Wound
9. Extent of Wound Face



Successional Wound

1. Initial wound face
2. Initial wound margins (concealed when viewed in Elevation)
3. Successive wound margins
4. Wound margins (current)
5. Trunk





Partially Bridged Occlusion

1. Partially Bridged Occlusion
2. Wound face
3. Wound margins
4. Initial Wound Margins
5. Apex
6. Base

Condition of Trees

Condition A tree's *crown form* and growth habit, as modified by its *environment* (aspect, suppression by other trees, soils), the *stability* and *viability* of the *root plate*, trunk and structural branches (first (1st) and possibly second (2nd) order branches), including structural defects such as wounds, cavities or hollows, *crooked* trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with *vigour* and it is possible for a tree to be of *normal vigour* but in *poor condition*. Condition can be categorized as *Good Condition*, *Fair Condition*, *Poor Condition* and *Dead*.

Good Condition Tree is of good habit, with *crown form* not severely restricted for space and light, physically free from the adverse effects of *predation* by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by vigour. See also *Condition*, *Fair Condition* and *Poor Condition*.

Fair Condition Tree is of good habit or *misshapen*, a form not severely restricted for space and light, has some physical indication of *decline* due to the early effects of *predation* by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the *environment* essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by vigour. See also *Condition*, *Good Condition* and *Poor Condition*.

Poor Condition Tree is of good habit or *misshapen*, a form that may be severely restricted for space and light, exhibits symptoms of advanced and *irreversible decline* such as fungal, or bacterial infestation, major die-back in the branch and *foliage crown*, *structural deterioration* from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local *environment* that would normally be sufficient to provide for its basic survival if in *good* to *fair* condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and *predation* by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by vigour. See also *Condition*, *Good Condition* and *Fair Condition*.

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;
Processes
Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);
Osmosis (the ability of the root system to take up water);
Turgidity (the ability of the plant to sustain moisture pressure in its cells);
Epicormic shoots or *epicormic strands* in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a *lignotuber*);
Symptoms
Permanent leaf loss;
Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);
Abscission of the *epidermis* (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site, or having been taken away from a site prior to site inspection.

Periods of Time

Periods of Time The life span of a tree in the urban environment may often be reduced by the influences of encroachment and the dynamics of the environment and can be categorized as *Immediate*, *Short Term*, *Medium Term* and *Long Term*.

Immediate An *episode* or occurrence, likely to happen within a twenty-four (24) hour period, e.g. tree failure or collapse in full or part posing an imminent danger. See also *Short Term*, *Medium Term* and *Long Term*.

Short Term A period of time less than <1 – 15 years. See also *Periods of Time*, *Immediate*, *Medium Term* and *Long Term*.

Medium Term A period of time 15 – 40 years. See also *Periods of Time*, *Immediate*, *Short Term* and *Long Term*.

Long Term A period of time greater than >40 years. See also *Periods of Time*, *Immediate*, *Medium Term* and *Short Term*.

Vigour

Vigour Ability of a tree to sustain its life processes. This is independent of the *condition* of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. *dormant*, deciduous or semi-deciduous trees. Vigour can be categorized as *Normal Vigour, High Vigour*, *Low Vigour* and *Dormant Tree Vigour*.

Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the *typical* growth of leaves, *crown cover* and *crown density*, branches, roots and trunk and *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation. See also *Vigour*, *Low Vigour* and *High Vigour*.

High Vigour *Accelerated growth* of a tree due to incidental or deliberate artificial changes to its growing *environment* that are seemingly beneficial, but may result in *premature aging* or failure if the favourable conditions cease, or promote *prolonged senescence* if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous *pollarding* practices over the life of the tree.

Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the *atypical* growth of leaves, reduced *crown cover* and reduced *crown density*, branches, roots and trunk, and a deterioration of their functions with reduced *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation. See also *Vigour*, *Normal Vigour* and *High Vigour*.

Dormant Tree Vigour Determined by existing turgidity in lowest order branches in the outer extremity of the crown, with good bud set and formation, and where the last *extension growth* is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.

Good Vigour See *Normal Vigour*.

Poor Vigour See *Low Vigour*.

Health A tree's *vigour* as exhibited by *crown density*, *crown cover*, leaf colour, presence of epicormic shoots ability to withstand *predation* by pests and diseases, *resistance* and the degree of *dieback*.

Age of Trees

Age Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as *Young*, *Mature* and *Over-mature* (British Standards 1991, p. 13, Harris *et al*, 2004, p. 262).

Young Tree aged less than <20% of life expectancy, *in situ*. See also *Age*, *Mature* and *Over-mature*.

Mature Tree aged 20-80% of life expectancy, *in situ*. See also *Age*, *Young* and *Over-mature*.

Over-mature Tree aged greater than >80% of life expectancy, *in situ,* or *senescent* with or without reduced *vigour*, and declining gradually or rapidly but irreversibly to death. See also *Age*, *Young* and *Mature*.

Premature Aging Apparent hastened aging and deterioration of a tree where it has been subject to conditions or practices adverse to expected normal growth, resulting in a *spiral of decline*. The following are examples of processes that may start such cycles:

- Top lopping of a mature tree
- In a new car park, the excavation of soil severing the roots of a tree close to its trunk and then sealing the soil surface with asphalt or concrete up to the trunk
- Open trenching alongside a street tree severing all roots in the trench, then top lopping it for power line clearance, and then extensive damage to bark by abrasion by trucks and excavation equipment as tree is adjacent to a construction site
- Root damage from *soil compaction* to substantial areas of the root plate.

Prolonged Senescence A phenomenon in an *over-mature* tree or tree with *structural deterioration* in its *condition* and often *vigour* as *abnormal vigour* as a result of modifications to the tree or the growing environment essential for its survival where it is sustained beyond the *typical* extent of its life cycle, or prevented from failing in full or part from *structural deterioration* by a beneficial artificial modification to its growing environment either by deliberate or incidental intervention, e.g. water from a leaking tap, water and nutrients from a leaking sewer pipe creating a *hydroponic* environment, or by physically propping up a tree with *structural deterioration* as with a *veteran tree*, or by it *leaning* or growing against another tree or structure for support.

Axiom of Uniform Stress The principle that a tree is mechanically optimized growing only sufficient wood for support and loading. As a result, no area is under-loaded to breaking point or over-loaded with excess material (Mattheck & Breloer 1994, pp. 12-13).

Visual Tree Assessment (VTA) A visual inspection of a tree from the ground based on the principle that, when a tree exhibits apparently superfluous material in its shape, this represents repair structures to rectify *defects* or to reinforce weak areas in accordance with the *Axiom of Uniform Stress* (Mattheck & Breloer 1994, pp. 12-13, 145). Such assessments should only be undertaken by suitably competent practitioners.

Drop Zone The distance away from a tree that may be physically influenced by a falling branch.

Fall Zone The distance away from a tree that may be physically influenced if it was cut down or subject to *collapse*.

Leaning Trees

Leaning A tree where the *trunk* grows or moves away from upright. A lean may occur anywhere along the *trunk* influenced by a number of contributing factors e.g. genetically predetermined characteristics, competition for space or light, prevailing winds, aspect, slope, or other factors. A *leaning* tree may maintain a *static lean* or display an increasingly *progressive lean* over time and may be hazardous and prone to *failure* and *collapse*. The degrees of leaning can be categorized as *Slightly Leaning*, *Moderately Leaning*, *Severely Leaning* and *Critically Leaning*.

Slightly Leaning A leaning tree where the trunk is growing at an angle within 0^{O}-15^{O} from upright.

Moderately Leaning A leaning tree where the trunk is growing at an angle within 15^{O}-30^{O} from upright.

Severely Leaning A leaning tree where the trunk is growing at an angle within 30^{O}-45^{O} from upright.

Critically Leaning A leaning tree where the trunk is growing at an angle greater than $>45^{O}$ from upright.

Progressively Leaning A tree where the degree of *leaning* appears to be increasing over time.

Static Leaning A leaning tree whose lean appears to have stabilized over time.

Windthrow Tree failure and collapse when a *force* exerted by wind against the *crown* and *trunk* overcomes resistance to that force in the *root plate*, such that the *root plate* is lifted from the soil on one side as the tree tips over.

Symmetry

Symmetry Balance within a *crown,* or *root plate,* above or below the *axis* of the trunk of branch and foliage, and root distribution respectively and can be categorized as *Asymmetrical* and *Symmetrical*.

Asymmetrical Imbalance within a crown, where there is an uneven distribution of branches and the foliage *crown* or *root plate* around the vertical *axis* of the trunk. This may be due to *Crown Form Codominant* or *Crown From* S*uppressed* as a result of natural restrictions e.g. from buildings, or from competition for space and light with other trees, or from exposure to wind, or artificially caused by pruning for clearance of roads, buildings or power lines. An example of an expression of this may be, crown asymmetrical, bias to west. See also *Symmetrical* and *Symmetry*.

Symmetrical Balance within a crown, where there is an even distribution of branches and the *foliage crown* around the vertical *axis* of the trunk. This usually applies to trees of *Crown Form Dominant* or *Crown Form Forest*. An example of an expression of this may be crown symmetrical. See also *Symmetry* and *Asymmetrical*.

Crown Spread Orientation Direction of the *axis* of *crown spread* which can be categorized as *Orientation Radial* and *Orientation Non-radial*.

Crown Spread Orientation Non-radial Where the crown extent is longer than it is wide, e.g. east/west or E/W. Further examples, north/south or N/S, and may be *Crown Form Codominant*, e.g. **A** or **B**, *Crown Form Intermediate* e.g. **A**, or *Crown Form Suppressed* e.g. **B**, *and* crown symmetry is *symmetrical* e.g. **A**, or *asymmetrical* e.g. **B**.

Crown Spread Orientation Radial Where the *crown spread* is generally an even distance in all directions from the trunk and often where a tree has *Crown Form Dominant* and is *symmetrical*.

Diameter at Breast Height (DBH) Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of *reaction wood* or *adaptive wood*, therefore an average diameter is determined with a *diameter tape* or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a *leaning* trunk is *crooked* a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the *trunk* from the point immediately below the base of the flange of the *branch collar* extending the furthest down the trunk, and the distance of this point above ground recorded as *trunk* length. Where a tree is located on sloping ground the DBH should be measured at half way along the side of the tree to average out the angle of slope. Where a tree is *acaulescent* or *trunkless* branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.

Significant Important, weighty or more than ordinary.

Significant Tree A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or *in situ*, or contribution as a component of the overall landscape for *amenity* or aesthetic qualities, or *curtilage* to structures, or importance due to uniqueness of taxa for species, subspecies, variety, *crown form*, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as *remnant vegetation*, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of Aboriginal cultural importance, or is a commemorative planting.

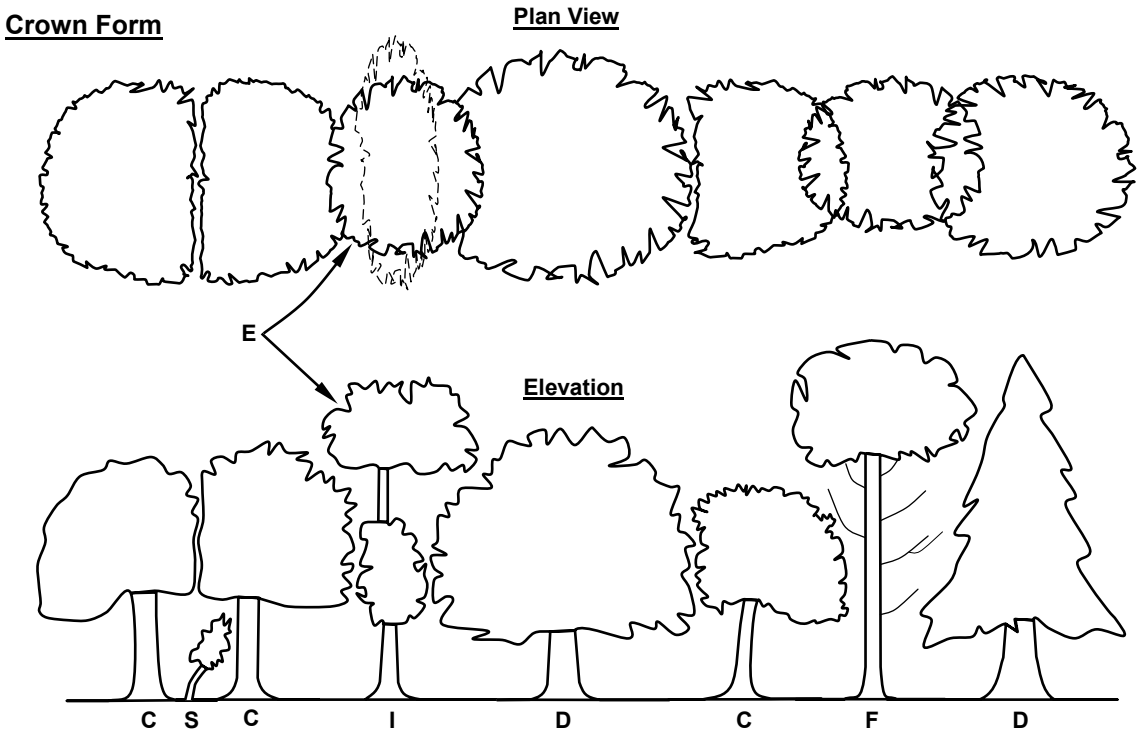
Sustainable Retention Index Value (SRIV) A visual tree assessment method to objectively determine a qualitative and numerical rating for the viability of urban trees for development sites and management purposes, based on general tree and landscape assessment criteria using classes of *age*, *condition* and *vigour*. SRIV is for the professional manager of urban trees to consider the tree *in situ* with an assumed knowledge of the *taxon* and its growing environment. It is based on the physical attributes of the tree and its response to its environment considering its position in a matrix for age class, vigour class, condition class and its sustainable retention with regard to the safety of people or damage to property. This also factors the ability to retain the tree with remedial work or beneficial modifications to its growing environment or removal and replacement. SRIV is supplementary to the decision made by a tree management professional as to whether a tree is retained or removed (IACA - Institute of Australian Consulting Arboriculturists 2005).

Form of Trees

Crown Form The shape of the crown of a tree as influenced by the availability or restriction of space and light, or other contributing factors within its growing environment. Crown Form may be determined for tree shape and habit generally as *Dominant*, *Codominant*, *Intermediate*, *Emergent*, *Forest* and *Suppressed*. The habit and shape of a *crown* may also be considered qualitatively and can be categorized as *Good Form* or *Poor Form*. See also *Forest Grown* and *Open Grown*.

Good Form Tree of *typical* crown shape and habit with proportions representative of the taxa considering constraints such as origin e.g. indigenous or exotic, but does not appear to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, or cultural practices such as lopping and competition for space and light. See also *Poor Form*.

Poor Form Tree of *atypical* crown shape and habit with proportions not representative of the species considering constraints and appears to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, cultural practices such as lopping and competition for space and light; causing it to be *misshapen* or disfigured by disease or vandalism. See also *Good Form*.



(Source: **D**, **C**, **I** and **S**, and Elevation, Matheny and Clark 1998, **E**, **F** and Plan View, IACA 2005)

D. Dominant, **F.** Forest, **C.** Codominant, **E.** Emergent, **I.** Intermediate, **S.** Suppressed

Crown Form Codominant Crowns of trees restricted for space and light on one or more sides and receiving light primarily from above e.g. constrained by another tree/s or a building.

Crown Form Dominant Crowns of trees generally not restricted for space and light receiving light from above and all sides. See also *Crown Form Emergent* and *Open Grown*.

Crown Form Emergent Crowns of trees restricted for space on most sides receiving most light from above until the *upper crown* grows to protrude above the canopy in a stand or forest environment. Such trees may be *crown form dominant* or transitional from *crown form intermediate* to *crown form forest* asserting both *apical dominance* and *axillary dominance* once free of constraints for space and light.

Crown Form Forest Crowns of trees restricted for space and light except from above forming tall trees with narrow spreading crowns with foliage restricted generally to the top of the tree. The trunk is usually erect, straight and continuous, tapering gradually, crown often excurrent, with first order branches becoming structural, supporting the live crown concentrated towards the top of the tree, and below this point other first order branches arising radially with each *inferior* and usually temporary, divergent and ranging from horizontal to ascending, often with internodes exaggerated due to competition for space and light in the *lower crown*.

Crown Form Intermediate Crowns of trees restricted for space on most sides with light primarily from above and on some sides only.

Crown Form Suppressed Crowns of trees generally not restricted for space but restricted for light by being *overtopped* by other trees and occupying an understorey position in the canopy and growing slowly.

Forest Grown A tree with *crown form forest* grown in a group with competition for space and light protected from wind, often resulting in a taller tree with a narrow spreading crown that is concentrated towards the top of the tree (Matheny & Clark 1998, p. 18).

Open Grown A tree with *crown form dominant*, grown singly without competition for space and light, exposed to wind, often resulting in a shorter tree with a broad spreading crown that extends towards the ground (Matheny & Clark 1998, p. 18).

Deadwood

Deadwood Dead branches within a tree's crown and considered quantitatively as separate to *crown cover* and can be categorised as *Small Deadwood* and *Large Deadwood* according to diameter, length and subsequent *risk* potential. The amount of dead branches on a tree can be categorized as *Low Volume Deadwood*, *Medium Volume Deadwood* and *High Volume Deadwood*. See also *Dieback.*

Deadwooding Removing of dead branches by *pruning*. Such pruning may assist in the prevention of the spread of *decay* from *dieback* or for reasons of safety near an identifiable target.

Small Deadwood A dead branch up to 10mm diameter and usually <2 metres long, generally considered of low *risk* potential.

Large Deadwood A dead branch >10mm diameter and usually >2 metres long, generally considered of high *risk* potential.

Low Volume Deadwood Where <5 dead branches occur that may require *removal*.

Medium Volume Deadwood Where 5-10 dead branches occur that may require *removal*.

High Volume Deadwood High Volume Deadwood Where >10 dead branches occur that may require *removal*.

Dieback

Dieback The death of some areas of the *crown*. Symptoms are leaf drop, bare twigs, dead branches and tree death, respectively. This can be caused by root damage, root disease, bacterial or fungal canker, severe bark damage, intensive grazing by insects, *abrupt changes* in growth conditions, drought, water-logging or over-maturity. Dieback often implies reduced *resistance, stress* or *decline* which may be temporary. Dieback can be categorized as *Low Volume Dieback*, *Medium Volume Dieback* and *High Volume Dieback*.

Low Volume Dieback Where <10% of the *crown cover* has died. See also *Dieback*, *High Volume Dieback* and *Medium Volume Dieback*.

Medium Volume Dieback Where 10-50% of the *crown cover* has died.

High Volume Dieback Where >50% of the *crown cover* has died.

Epicormic Shoots

Epicormic Shoots Juvenile shoots produced at branches or trunk from *epicormic strands* in some Eucalypts (Burrows 2002, pp. 111-131) or sprouts produced from dormant or latent buds concealed beneath the bark in some trees. Production can be triggered by fire, pruning, wounding, or root damage but may also be as a result of *stress* or *decline*. Epicormic shoots can be categorized as *Low Volume Epicormic Shoots*, *Medium Volume Epicormic Shoots* and *High Volume Epicormic Shoots*.

Low Volume Epicormic Shoots Where <10% of the c*rown cover* is comprised of live *epicormic shoots*.

Medium Volume Epicormic Shoots Where 10-50% of the *crown cover* is comprised of live *epicormic shoots*.

High Volume Epicormic Shoots Where >50% of the *crown cover* is comprised of live *epicormic shoots*.

Epicormic Strands In some taxa of the Myrtaceae family narrow bands of meristematic tissue radiate in stems from pith extending to the outer bark containing bud primordia evident as small prickle or dimple structures up to 10 mm diameter, that after the stimulus of a trauma event such as fire or defoliation develop to form new buds allowing *crown regeneration* (Burrows 2001, Pp. 111-131).

Trunk

Acaulescent A *trunkless* tree or tree growth forming a very short *trunk*. See also *Caulescent.*

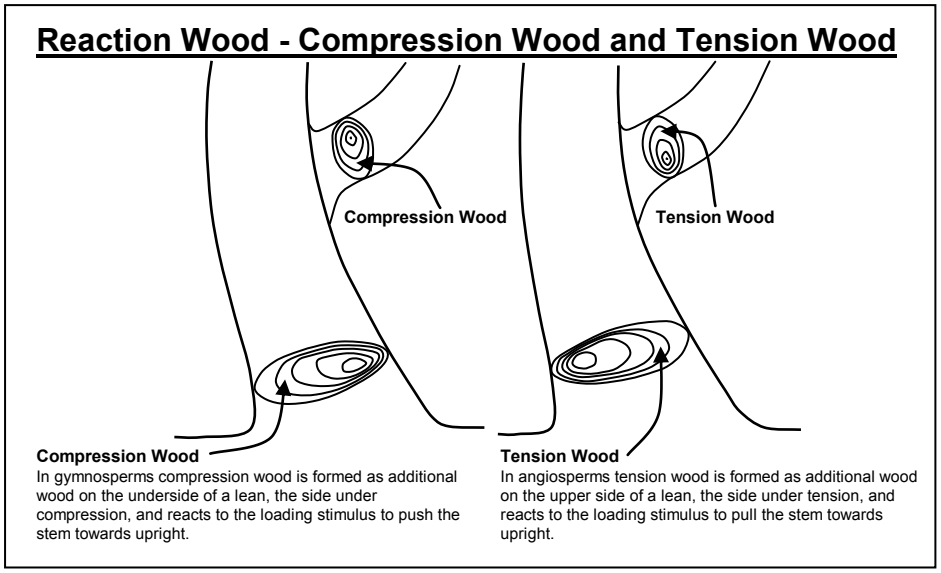
Caulescent Tree grows to form a *trunk*. See also *Acaulescent*.

Trunk A single stem extending from the *root crown* to support or elevate the *crown*, terminating where it divides into separate *stems* forming *first order branches*. A trunk may be evident at or near ground or be absent in *acaulescent* trees of *deliquescent* habit, or may be continuous in trees of *excurrent* habit. The trunk of any *caulescent* tree can be divided vertically into three (3) sections and can be categorized as *Lower Trunk*, *Mid Trunk* and *Upper Trunk*. For a *leaning* tree these may be divided evenly into sections of one third along the trunk.

Acoustic resonance Auditory reverberation within an object and the air after an object has been struck.

Sounding Tapping of roots, trunk or branches with a mallet or hammer to sample the *acoustic resonance* to compare sound wood with wood that is decayed or *hollow*.

Adaptive wood Additional load-bearing wood formed in response to mechanical stresses and gravitational force upon the *vascular cambium* to provide a uniform distribution of loading. Examples are *Ribs*, *Round-edged rib* or *Sharp-edged rib* and *Buttresses.* See also *Reaction wood*, *Compression wood* and *Tension wood.*



Reaction wood A negative geotropic response in some *secondary xylem* to counter a lean or predominant mechanical force, formed as *tension wood* in dicotyledonous *angiosperms* and as *compression wood* in *gymnosperms* (Figure 24). See also *Adaptive wood*.

Compression Wood *Reaction wood* formed by Gymnosperms as additional wood growth on the under side of a stem opposing a lean, reacting to the loading stimulus to push the stem upwards.

Tension Wood *Reaction wood* formed in dicotyledonous *Angiosperms* as additional wood growth on the upper side of a stem opposing a lean, reacting to the loading stimulus to pull the stem upwards.

Attachment 2.6

Contamination Report

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DESKTOP GEOTECHNICAL AND CONTAMINATION REZONING REPORT
GLENFIELD WASTE SERVICES, CAMBRIDGE AVENUE, GLENFIELD, NSW
PREPARED FOR ENVIRONMENTAL PROPERTY SERVICES

REPORT ID: CES120413-LAK-01-G
Revision No: 3.0

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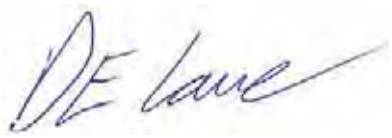

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DESKTOP GEOTECHNICAL AND CONTAMINATION REZONING REPORT
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1 INTRODUCTION

Consulting Earth Scientists Pty Ltd (CES) have been commissioned by Environmental Property Services Pty Ltd (EPS) on behalf of L.A. Kennett Enterprises (The Kennett Family (the Client)), to undertake a 'Desktop Geotechnical & Contamination Rezoning Report' (for brevity herein referred to as the DGCR) for land located in Cambridge Avenue, Glenfield NSW, 2167 (herein referred to as the site). The site location map is shown on Figure 1.

The DGCR is to be provided and the results used as part of a submission by the Client for rezoning of part of the Glenfield Waste Services (GWS) landholding for industrial uses and activities undertaken on and/or adjacent to the site. The land subject to the rezoning application comprises approximately 60 hectares of the GWS land, located on the southern side of the Liverpool/Campbelltown City Boundary (which lies immediately north of the East Hills Rail Line). The subject land (the site) lies entirely within the Campbelltown City Council Local Government Area. Figure 2 shows the site layout and surrounds.

2 OBJECTIVES AND SCOPE

The objectives of the DGCR were to include information with regards to the following:

- Description of the proposal and study area.
- Site history.
- Subsurface geotechnical conditions based on existing geological mapping and available site information.
- Identification of any past or present potentially contaminating activities.
- Assessment in accordance with the SEPP No 55 – Remediation of Land and associated planning guidelines.
- Any restrictions that may apply to the completed landfill cells.
- If deemed applicable, recommendations with regards to remediation works that may be required.
- Recommendations with regards to suitability of land or that it can be made suitable for an industrial zone and associated land uses.

To achieve these objectives, CES undertook the following scope of works:

- Review our database for information from previous investigations and reports at the site (both environmental and geotechnical).
- Compile an outline of the site's history, including both the filled and non-filled areas of the land proposed for re-zoning.
- Examine historic air photos, land title information, council records, filling records etc.
- Contact Council to obtain pertinent information.
- Identify any past potentially contaminating uses of the land.
- Research soil capability and landscape maps and data relating to the area (including groundwater conditions).
- Carry out a detailed surface inspection of the area (including the area to the south of Cambridge Avenue).
- Provide an assessment of the geotechnical conditions and provide a preliminary geotechnical model for the site.
- Identify any remediation that may be necessary and assess any environmental or geotechnical constraints to industrial development.
- Provide a draft and final copy of a report that addressed the objectives stated in Section 2 above and clearly outlines the suitability of the land for industrial development and where further investigations are required. We will provide one electronic copy of the draft and final reports (in PDF Format).

Note: Should the rezoning application be successful, further studies will likely be required for any proposed development, such as a more detailed Environmental Site Assessment (ESA) and possibly a Remediation Action Plan (RAP), as well as a site-specific geotechnical investigation. Provision of such assessments and plans is not included in the scope of works for this report (DGCR).

3 PREVIOUS ENVIRONMENTAL AND GEOTECHNICAL INVESTIGATIONS

CES are not aware of any previous investigations or reports pertaining to environmental investigations or assessments conducted on the subject site.

Geotechnical investigations have been conducted by CES in areas of Glenfield Waste Services land located north of Cambridge Avenue and south of the East Hills Railway line and are therefore relevant to this DGCR (CES, 2007, refer Appendix C). Fill was observed at boreholes BH17A, BH17B, BH13D and BH14D, and consisted of fine grained sand, clayey sand and clay with some concrete and glass. Fill is underlain by natural soils, which comprise sandy clay and silty sand. Natural soils extend to elevations between 3mAHD to 6mAHD, and overlie weathered sandstone.

Subsurface ground conditions observed at boreholes LG1, LG2, LG3, BH10D and BH15S consist of natural soils comprising sandy clay, silty clay and silty sand underlain by shale or sandstone. These boreholes are within areas of the site that have not been previously filled. These borehole locations are shown in Appendix C.

To our knowledge, no previous geotechnical investigations have been conducted on the area South of Cambridge Avenue.

4 SITE INFORMATION

The site information presented below is based on a review of readily available government information sources.

4.1 SITE IDENTIFICATION

The site subject to the rezoning application is located in Glenfield, New South Wales, approximately bounded to the north and west by the East Hills Rail Line, to the east by the Georges River and extends south over Cambridge Avenue to include a roughly rectangular strip of land approximately 1km long (east-west) by 165m wide (north-south). The site comprises several Lots, and is legally described as:

- Auto Consol 14018 – 92, being Lot 91 DP 1155962 (formerly Lot 9 DP 833516) , Lot 2 DP 333578, Lot 1 DP 113201
- Lot 3, DP 735524
- Lot 3, DP 736881

4.2 SITE ZONING

A review of the Campbelltown Local Environmental Plan 2002 (CLEP 2002) indicated that the site has three different zoning classifications. The majority of the area north and south of Cambridge Avenue is zoned 1(a) Rural A. The eastern part of the site adjoining the Georges River is zoned 6(b) Regional Open Space and there is a small rectangular portion of land located south of Cambridge Avenue and west of zone 6(b), which is separately zoned 5(b) Special Uses Arterial Roads.

4.3 TOPOGRAPHY AND DRAINAGE

The Liverpool 1:25 000 Topographic Map 9030-11-S (Central Mapping Authority NSW, 1983) indicates that the site has an elevation that ranges from approximately 20 metres Australian Height Datum (AHD) in the western section of the site to approximately 10 m AHD in the eastern section of the site.

Drainage on the site is towards the east, to the Georges River, which flows in a northerly direction.

4.4 GEOLOGY

The Penrith 1:100 000 Geological Series Sheet 9030 (Geological Survey of NSW Department of Minerals and Energy, 1991) indicates that the site is underlain by Triassic age Ashfield Shale, (part of the Wianamatta Group) as well as Quaternary alluvium, comprising medium grained sand, clay and silt, associated with the Georges River system, and tributaries.

4.5 SOILS

The Penrith 1:100 000 Soil Landscape Series Sheet 9030 (Soil Conservation Service of NSW, 1989) indicates that the soils underlying the site (where they have not been removed by excavation) belong to the Blacktown soil landscape group. These soils are found on undulating rises on Wianamatta Shales. Soils are shallow to moderately deep (< 100 cm) *Red and Brown Podzolic Soils (Dr3.21, Dr3.11, Db2.11)* on crests, upper slopes and well drained areas; deep (150 - 300 cm) *Yellow Podzolic Soils (Dy2.11, Dy3.11)* on lower slopes and areas of poor drainage. The limitations of this soil landscape group are moderate reactivity, low soil fertility and poor soil drainage.

4.6 ACID SULFATE SOIL RISK

The Department of Land and Water Conservation (DLWC 1997) 1:25 000 Liverpool Acid Sulphate Soil (ASS) Risk Map was reviewed to ascertain the presence of acid sulphate soils on the site. The Risk Map indicated that there were no known occurrences of Acid Sulphate Soils in or around the site area. Council's Section 149 Planning Certificates indicate that the land is not subject to a policy that restricts development because of the likelihood of acid sulphate soils (refer section 4.10 below).

4.7 SITE HISTORY

The following sources of historical information were investigated to determine the history of land use at the site:

- NSW Department of Land and Property Management Authority: Historical aerial photographs (1961 to 1970) and more recent aerial photography available on-line;
- Campbelltown Council: Planning Certificate;

4.8 LAND USE

The site can be divided into three broad areas according to land use: filled land in the north-east part, unfilled land in the north-west area (north of Cambridge Avenue) and the unfilled cleared land on the southern side of Cambridge Avenue. Previously, the north-western part of the site was used by Glenfield Waste Services as an active waste landfill for non-putrescible solid waste. Construction and demolition waste made up the largest portion of waste received in this area and only 15 hectares has been filled. Currently, Glenfield Waste Services undertakes recycling activities on the filled area and some of the unfilled areas. The recycling activities are predominantly of inert materials. The area currently used for active land-filling is further to the north, within Liverpool City Council.

That part of the site to the south of Cambridge Avenue appears to have had no previous active uses and still remains as unoccupied open space. Whilst it borders on residential properties there is no evidence of any existing land use other than for grazing of horses.

4.9 HISTORICAL AERIAL PHOTOGRAPH INTERPRETATION

Historical aerial photographs from the NSW Department of Land and Property Management Authority were examined for the years: 1951, 1961, and 1970. As well as a previously obtained aerial photograph for 2004 and Nearmap photographs for 2011. Copies of the aerial photographs are provided in Appendix A. The findings of aerial photo investigations are presented in Table 1.

Table 1: Historical Aerial Photograph Interpretation

Year	Description
1951	**Site:** The site is undisturbed and comprises largely natural vegetation. The Georges River borders the eastern part of the site and the existing Main Southern railway line and a main road, borders the western boundary. The site is bordered in the south by an unsealed road , just north of which lies dense natural vegetation. The land in the north-east corner of the site has been cleared for market gardens or horticultural activity. . **Surrounding Area:** The site is surrounded by similar land uses. The area to the north of the site is delineated by the Main Southern railway line and the Georges River and includes some market gardens. Land surrounding these gardens may have been cleared or it may have been open space prior to 1951. The southern and western borders can be similarly described and the surrounding eastern land comprises the Georges Rives and associated vegetation.
1961	**Site:** The site has changed little since 1951 with the exception of a small square shaped cleared patch of land in the centre and another long, thin, rectangular cleared patch of land running parallel to Georges River. The existing roads also appear to be more defined. **Surrounding Area:** The surrounding land to the north of the site has changed little since 1951 with the exception of an extension of the already existing market garden. The surrounding land south of the site has been cleared for further cultivation (farmland) and the beginning presence of residential buildings. Further residential buildings have been constructed east of the site however most of the original vegetation still stands. The western boundary has had little/if any modification.
1970	**Site:** The dense vegetation in the centre of the site has been extensively cleared to become two smaller and more defined rectangular areas. A dam has been built just north of this vegetation and in the north western corner of the site there appears to be the beginning of quarrying activities. The rest of the site has changed little since 1961. **Surrounding Area:** Surrounding area has changed little since the 1961 aerial photograph.
2004	**Site:** The site has changed extensively since 1970. The East Hills railway line has been constructed, diverting eastward from the Main Southern railway line, to form the northern boundary of the subject site. Cambridge Avenue has been constructed, dividing the site into two distinct parts. North of Cambridge Avenue can be separated again into two parts. The eastern area is the Glenfield Waste Services active landfill and the western area comprises of what appears to be still the original vegetation and the dam. The land south of

	Cambridge Avenue has been entirely cleared, with the exception of a small patch next to the Georges River, and left to become grazing land. There has been a large roundabout and extending roads constructed at the western end of Cambridge Avenue. These roads pass alongside and over the Main Southern railway line. **Surrounding Area:** The surrounding land to the north has been entirely cleared to form the rest of the Glenfield Waste Services landfill site. The landfill extends north to where the railway line meets The Georges River. North-west and south of the site has been extensively built up since 1970. Several roads have been constructed in between the residential buildings, including Goodenough Street forming the boundary between the southern part of the site and the newly developed residential areas. The surrounding land to the east of the site including The Georges River remains undeveloped.
2011	**Site:** The site has changed little since the 2004 aerial photograph. **Surrounding Area:** The surrounding area has changed little since the 2004 aerial photograph.
Source: Environmental Legal Searches, 2012.	

4.10 CAMPBELLTOWN COUNCIL PLANNING CERTIFICATE

The Campbelltown City Council Section 149 Planning Certificates for the major lots comprising the site are provided in Appendix B. The certificates for Lot 3 DP 736881 and Lot 91 DP 1155962 make reference to the Contaminated Land Management Act 1997, and state that those parcels of land are not 'significantly contaminated land' under the Act, and that they are not subject to a management order, an approved voluntary management proposal, an ongoing maintenance order or a site audit statement within the meaning of the Act.

The Planning Certificates also indicate that the land is not subject to a policy that restricts development because of the likelihood of acid sulphate soils, but the land may be subject to flood related development controls.

4.11 NSW DECCW CONTAMINATED SITES REGISTER

A search of the NSW DECCW Contaminated Sites Register indicated that neither the site nor surrounds are on the list of contaminated sites notified to the EPA.

4.12 GROUNDWATER BORE SEARCH

A search of the groundwater database maintained by the Department of Water and Energy was performed. The search indicated that there were 5 registered boreholes located within a

1km radius of the subject site. A copy of the borehole map is provided in Appendix C. As can be observed, the closest borehole GW108802 is located within the site boundary. The next closest boreholes to the site were GW109805, GW109799 and GW109803. The fifth registered borehole contained no featured information. No evidence of contamination was noted in any of these bores, however fill material was observed at various depths

5 SITE CONDITION AND THE SURROUNDING ENVIRONMENT

5.1 CURRENT OCCUPIER AND OPERATIONS

At the time of the DGCR, the eastern end of the site, north of Cambridge Avenue, is occupied by Glenfield Waste Services and is being used as the main access to the Glenfield landfill waste facility and recycling operation. The western and southern part of the land north of Cambridge Avenue remains largely timbered and has not been filled; it includes the brick house and a run-off collection dam. That part of the site south of Cambridge Avenue is currently unoccupied open space, used only for grazing horses, and is almost entirely covered by the easement for the high-voltage electricity transmission lines.

5.2 SITE DESCRIPTION

The site description is based on observations made during a site inspection undertaken by David Johnson and Paige Edmunds on 9 May 2012. The site location is shown on Figure 1 and the site layout on Figure 2. The site inspection was divided into two parts:

- South of Cambridge Avenue (part Lot 3 DP 736881); is rectangular shaped and appears to be natural land. The area consists of cleared uneven sloping ground with the major a major electricity transmission line passing along its length in an east-west orientation. The power lines are supported by steel pylons and were observed to hang quite low, particularly in the middle of the site. There is a small stagnant creek and swamp situated at the eastern end of the site which flows into the Georges River. The southern edge of the site is bordered by the rear fences of houses on Ferguson Street (western end) and the northern side of Goodenough Street (western end). At the time of the site inspection there were animals grazing on the land.

- North of Cambridge Avenue (Lot 91 DP 1155962, Lot 2 DP 333578, Lot 1 DP 113201 and Lot 3, DP 735524) all form part of the Glenfield Waste Service landholding; this part is also approximately rectangular shaped and is divided into two uses. The eastern part of the site has been filled and is still active as a waste sorting and recycling facility. It also acts as the main entry for the current landfilling operations (which now take place further north, within the Liverpool Council area), the GWS site offices and car park etc. In the southern and eastern parts of this northern area, no filling has occurred and the land remains largely uncleared; a brick house is present near the centre of the western part, along with a dam and water recycling plant

closer to the railway line. Situated on the northern side of Cambridge Avenue is a Crown Castle wireless communication carrier, which is surrounded by fencing.

5.4 FILL

It is apparent (and confirmed through a historical aerial photograph analysis) that filling has previously occurred only in the north-eastern part of the subject site, as part of the GWS landfilling operations. The exact nature of the filling materials placed in this area is not known, but is known to have included sand, clayey sand and clay with some concrete and glass, and possibly other non-putrescible and inert waste materials. Only limited geotechnical investigations have been carried out in this area and the exact nature of this fill cannot be determined without an intrusive geotechnical or environmental assessment.

The rest of the site does not appear to have been filled, except for some earthworks associated with roadworks, railway construction etc.

5.5 SURROUNDING LAND USE

At the time of preparing this DGCR the northern section of the site adjoins the rest of the Glenfield Waste Services landfill site. No filling is currently taking place on the subject site and it is not considered to be having any current adverse effect on the local environment.

The southern and western sections of the site are surrounded by residential dwellings. These establishments were not considered to have any adverse effect on the local environment surrounding the site. The eastern section of the site is still bounded by The Georges River and natural vegetation.

6 ASSESSMENT OF CONSTRAINTS TO DEVELOPMENT

6.2 ENVIRONMENTAL CONSTRAINTS

This preliminary assessment of environmental constraints relating to surface conditions and potential contamination has not raised any concerns which could pose significant constraints to future industrial development of the subject land. Further investigations are recommended prior to any proposed development in the areas of previous landfilling in the north-western part and also that land on the northern side of the Glenfield-East Hills Railway (for both environmental and geotechnical purposes).

The unfilled areas of the site do not appear to have been used in the past for any purposes which are likely to have led to ground contamination. There is no evidence of intensive agricultural or other land uses which could be expected to be potentially contaminating and impacts from the adjacent filled areas are unlikely to have affected those unfilled areas of the site.

Some constraints to actual development of the land south of Cambridge Avenue may result from the existing high-voltage transmission lines and easement, and this would be the subject of further assessment of available options for development of that area.

6.3 GEOTECHNICAL CONSTRAINTS

Previous geotechnical investigations showed that fill is present in boreholes BH17A, BH17B, BH13d and BH14d (refer Appendix C), and is variable in density, consistency, composition and thickness, and was placed with no known engineering control. This material is unlikely to provide uniform support to pavements, floor slabs or footings. We recommend against supporting structural loads or floor slabs on Fill unless ground improvement is undertaken.

Groundwater was encountered in boreholes BH10D, BH13d, BH15S, LG1 and LG2 within Natural Soils and Shale at levels between 2mbgl and 8.5mbgl (RL 3.8mAHD to RL 5.7mAHD). It should be noted however that groundwater levels vary over time especially after periods of heavy rain. Groundwater is likely to be encountered if deep foundation systems are required.

Measures should be included as part of any development to ensure that adequate drainage is in place to facilitate the controlled and environmentally responsible removal of surface and groundwater.

7 CONCLUSIONS

CES have undertaken and completed the Desktop Geotechnical & Contamination Rezoning Report in accordance with the proposal dated 23 April 2012, and the scope of work outlined therein. None of the findings of this study indicate that the subject land is not suitable for rezoning for industrial purposes, or for subsequent subdivision and development of individual lots for appropriate industrial activities.

It is therefore concluded that the findings of this report are sufficient to satisfy the requirements of SEPP 55 and the attached Planning Guidelines in that the subject land is suitable for the proposed industrial rezoning.

8 LIMITATIONS OF THIS REPORT

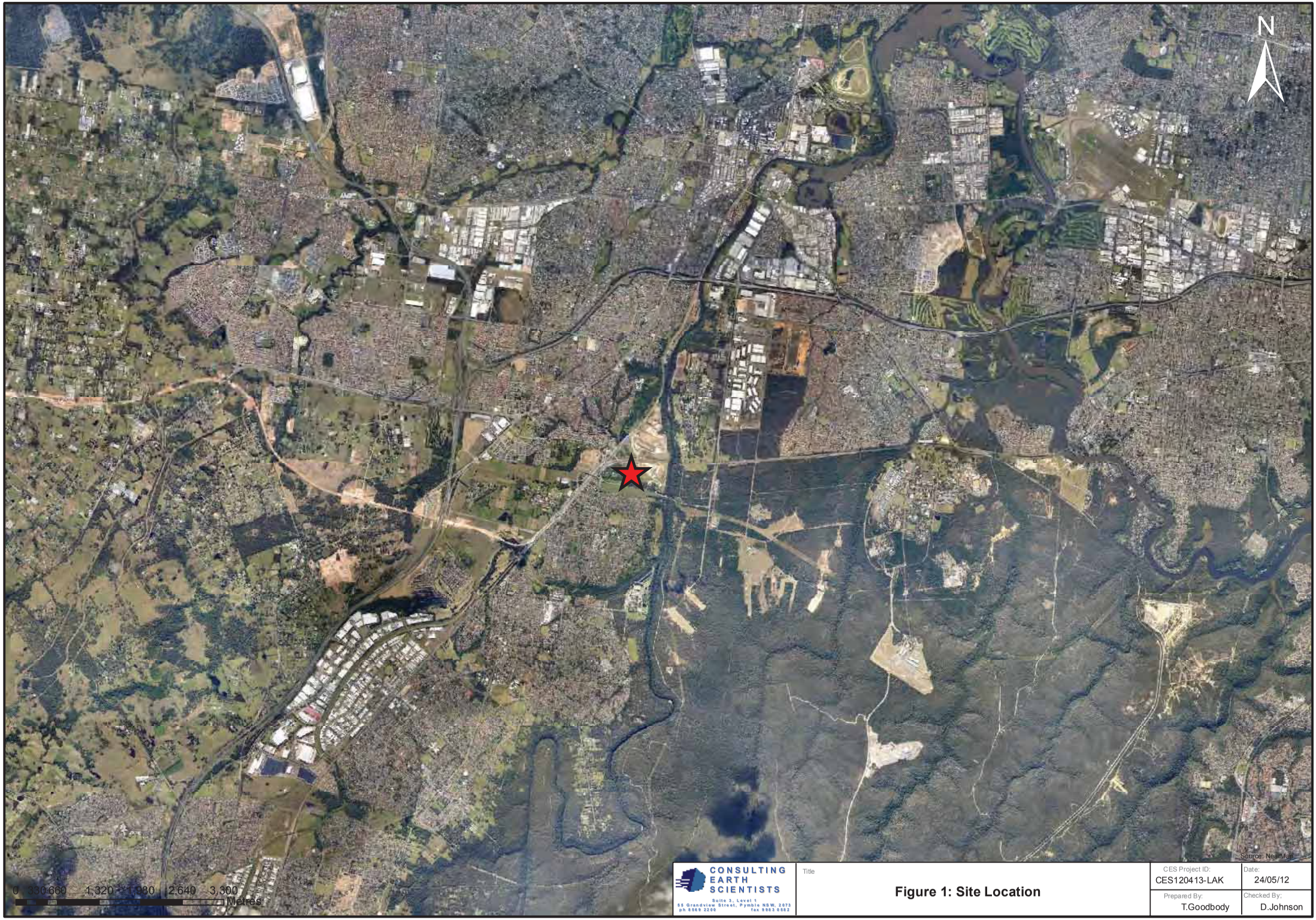
This report has been prepared for use by the client who commissioned the works in accordance with the project brief and based on information provided by the client. The advice contained in this report relates only to the current project and all results, conclusions and recommendations should be reviewed by a competent person with experience in environmental investigations before being used for any other purpose. Consulting Earth Scientists Pty Ltd (CES) accepts no liability for use or interpretation by any person or body other than the client. This report must not be reproduced except in full and must not be amended in any way without prior approval by the client and CES.

This report is based on the interpretation of available data and other information. It does not provide a complete assessment of the environmental status of the site and is limited to the scope defined therein. Should information become available regarding conditions at the site including previously unknown sources of contamination, CES reserves the right to review the report in the context of the additional information.

9 REFERENCES

Consulting earth Scientists Pty Ltd, 2007. *Landfill Environmental Management Plan (LEMP), Glenfield Waste Solid Waste landfill, Cambridge Avenue, Glenfield, NSW.* Prepared for LA Kennett Enterprises Pty Ltd, CES031101-LAK-28-F, 30 June 2007

Campbelltown City Council Local Environmental Plan, 2002



CONSULTING EARTH SCIENTISTS
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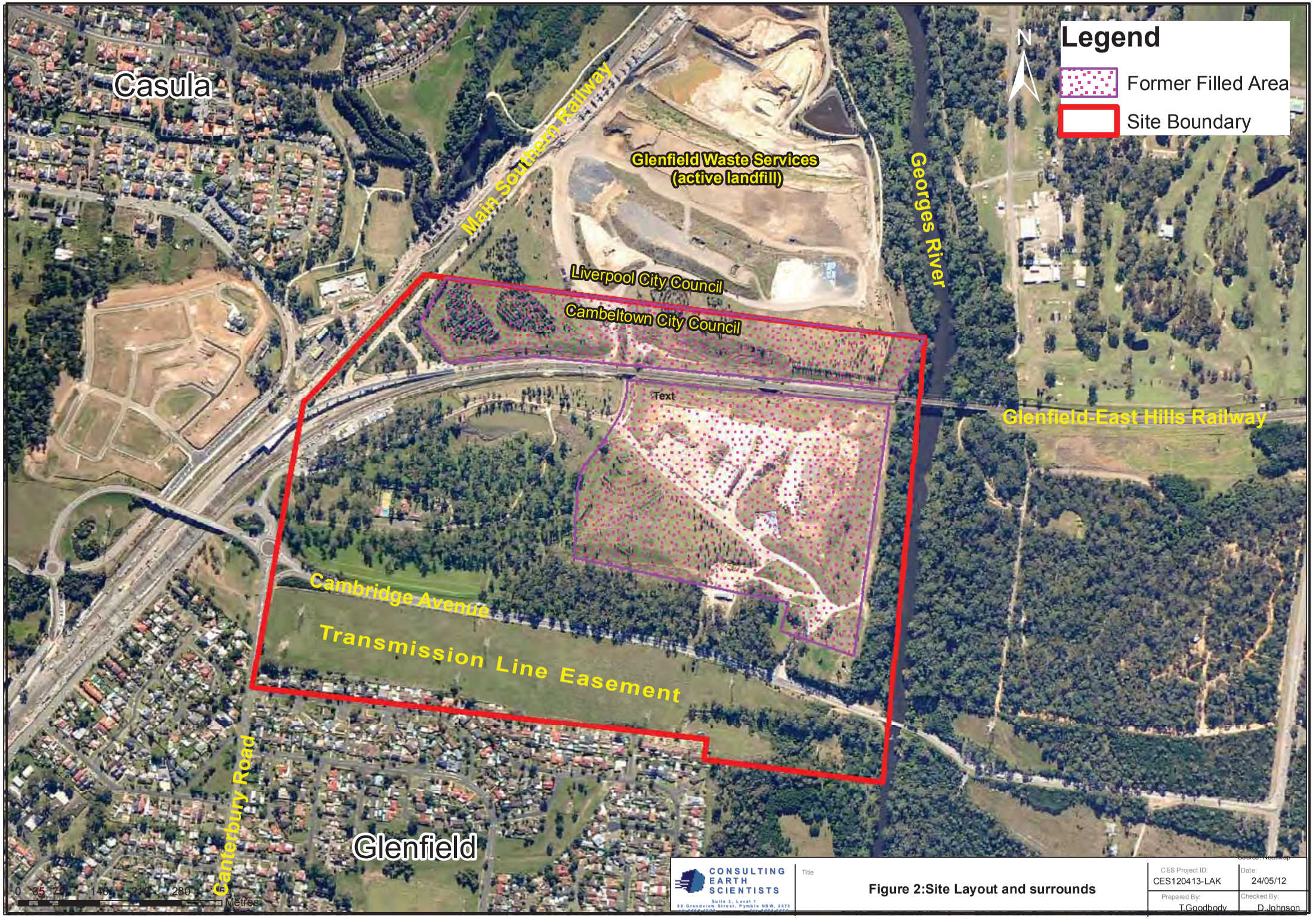
Title

Figure 1: Site Location

CES Project ID:	Date:
CES120413-LAK	24/05/12
Prepared By: T.Goodbody	Checked By: D.Johnson


Legend
Former Filled Area
Site Boundary
N
Casula
Main Southern Railway
Glenfield Waste Services
(active landfill)
Georges River
Liverpool City Council
Cambeltown City Council
Text
Glenfield-East Hills Railway
Cambridge Avenue
Transmission Line Easement
Canterbury Road
Glenfield
0 35 70 140 210 280
Metres
CONSULTING EARTH SCIENTISTS
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Title
Figure 2:Site Layout and surrounds
CES Project ID: CES120413-LAK
Date: 24/05/12
Prepared By: T.Goodbody
Checked By: D.Johnson
Source: Nearmap

Appendix A
Historical Air Photographs

Source: NearMap

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Title

Aerial Photograph 1951

CES Project ID:	Date:
CES120413-LAK	25/05/2012
Prepared By: T.Goodbody	Checked By: D.Johnson

Source: NearMap

CONSULTING EARTH SCIENTISTS
Suite 3, Level 1
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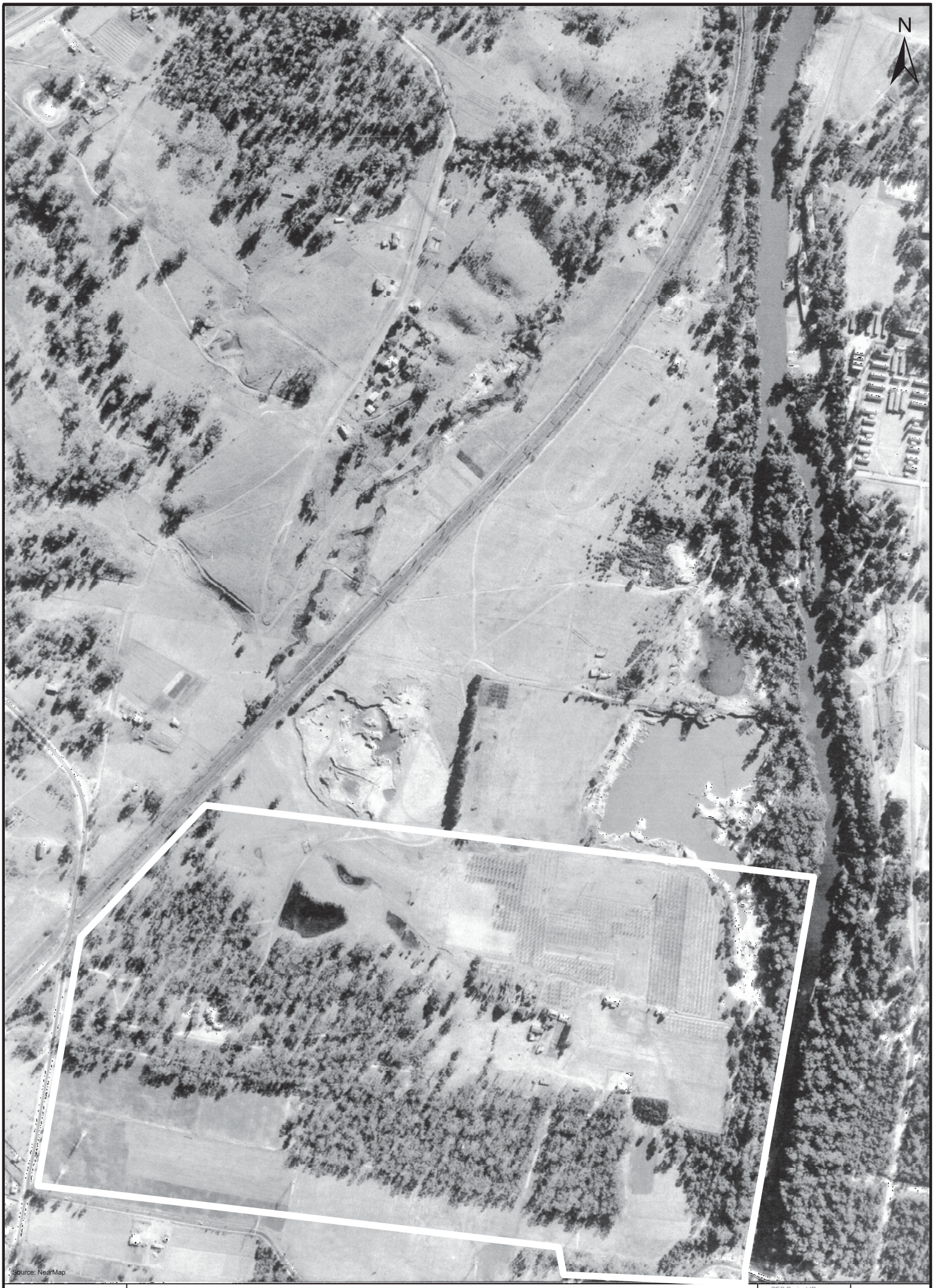
Title

Aerial Photograph 1961

CES Project ID:	Date:
CES120413-LAK	25/05/2012
Prepared By: T.Goodbody	Checked By: D.Johnson



CONSULTING EARTH SCIENTISTS
Suite 3, Level 1
55 Grandview Street, Pymble, NSW, 2073
ph 8569 2200 fax 9983 0582

Title

Aerial Photograph 1970

CES Project ID:	Date:
CES120413-LAK	25/05/2012
Prepared By: T.Goodbody	Checked By: D.Johnson

Source: NearMap

CONSULTING EARTH SCIENTISTS
Suite 3, Level 1
55 Grandview Street, Pymble, NSW, 2073
ph 8569 2200 fax 9983 0582

Title

Aerial Photograph 2004

CES Project ID:	Date:
CES120413-LAK	25/05/2012
Prepared By: T.Goodbody	Checked By: D.Johnson

CONSULTING EARTH SCIENTISTS
Suite 3, Level 1
55 Grandview Street, Pymble, NSW, 2073
ph 8569 2200 fax 9983 0582

Title

Aerial Photograph 2011

CES Project ID:	Date:
CES120413-LAK	25/05/2012
Prepared By: T.Goodbody	Checked By: D.Johnson

Appendix B
Campbelltown City Council Planning Certificates

campbelltown
city council

Issue Date: 20 April 2012
Application Number: 201201113
Receipt Number: 1964209

Globalx Information Services
DX 1239
SYDNEY NSW

Your Reference: 570849-11012

PLANNING CERTIFICATE UNDER SECTION 149 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Section 149 Planning Certificate phone enquiries: (02) 4645 4560.

Property Address: Lot 3 Cambridge Avenue
GLENFIELD NSW 2167

Property Description: Lot 3 DP 736881

As at the date of issue, the following matters apply to the land subject of this certificate:

INFORMATION PROVIDED UNDER SECTION 149(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (the Act)

PART 1 – Names of relevant planning instruments and DCPs

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 1(a) - Rural A Zone

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 6(b) - Regional Open Space Zone

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 5(b) - Special Uses Arterial Roads Zone

(1) In addition to the environmental planning instrument(s) named above, the following planning instruments also apply to the carrying out of development on the land subject of this certificate:

Local environmental plans (LEPs) and deemed environmental planning instruments

Campbelltown LEP No.209 – Exempt Development

For further information about these local environmental plans and deemed environmental planning instruments, contact Council's Environmental Planning Section on (02) 4645 4842.

State environmental planning policies (SEPPs)

SEPP No.1 – Development Standards

SEPP No.4 – Development Without Consent and Miscellaneous Complying Development

SEPP No.6 – Number of Storeys in a Building

SEPP No.21 – Caravan Parks

SEPP No.22 – Shops and Commercial Premises

SEPP No.30 – Intensive Agriculture

SEPP No.33 – Hazardous and Offensive Development

SEPP No.44 – Koala Habitat Protection

SEPP No.50 – Canal Estate Development

SEPP No.55 – Remediation of Land

SEPP No.60 – Exempt and Complying Development

SEPP No.64 – Advertising and Signage

SEPP No.65 – Design Quality of Residential Flat Buildings

SEPP No.70 – Affordable Housing (Revised Schemes)

SEPP No.19 - Bushland in Urban Areas

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Temporary Structures and Places of Public Entertainment) 2007

SEPP (Infrastructure) 2007

SEPP (Exempt and Complying Development Codes) 2008

SEPP (Affordable Rental Housing) 2009

SEPP (State and Regional Development) 2011

Greater Metropolitan REP No.2 - Georges River Catchment

For further information about these State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(2) The following proposed environmental planning instruments, which are or have been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified Council that the making of the proposed instrument has been deferred indefinately or has not been approved), apply to the carrying out of development on the land subject of this certificate:

Draft local environmental plans (LEPs)

None

For further information about these draft local environmental plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Draft State environmental planning policies (SEPPs)

None

For further information about these draft State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(3) The following development control plans (DCPs) apply to the carrying out of development on the land subject of this certificate:

Campbelltown DCP No.82 – Religious Establishment Policy

Campbelltown DCP No.87 – Public Notification & Public Exhibition Policy

Campbelltown DCP No.96 – The Provision of Parenting Facilities

DCP No.99 – Advertising Signs

DCP No.107 – Siting of Communication Facilities (Telecommunication Towers)

Campbelltown DCP No.114 – Trees

Campbelltown DCP No.122 – Restricted Premises

Campbelltown Sex Industry DCP 2003

Campbelltown (Sustainable City) DCP 2009 Volume 2

Campbelltown (Sustainable City) DCP 2009 Volume 1 (Parts 1-8)

Campbelltown DCP No.32 - Retail Plant Propagation Nurseries

DCP No.49 - Rural Environmental Protection Subdivision and Dwelling Policy

Campbelltown DCP No.47 – Amendment to Residential Development Policy – Attached Flats

Campbelltown DCP No.120 - Parking of Commercial Vehicles and Trucks Within Residential, Scenic Protection and Rural Areas

For further information about these development control plans, contact Council's Environmental Planning Section on (02) 4645 4842. Please note that the names of any draft development control plans that apply to the land subject of this certificate, that have been placed on exhibiton by Council but have not yet come into effect, are provided as advice under section 149(5) of the Act.

PART 2 – Zoning and land use under relevant LEPs

a) The following zone(s) apply to the land subject of this certificate:

1(a) - Rural A Zone

6(b) - Regional Open Space Zone

5(b) - Special Uses Arterial Roads Zone

b) The purposes for which the plan or instrument provides that development may be carried out without the need for development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and Campbelltown LEP No.209 – Exempt Development allow certain types of development to be carried out as exempt development within the Campbelltown City local government area.

c) The purposes for which the plan or instrument provides that development may not be carried out except with development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and SEPP No.60 – Exempt and Complying Development allow certain types of development to be carried out as complying development within the Campbelltown City local government area after a complying development certificate has been obtained from Council or from an accredited certifier.

d) The purposes for which the plan or instrument provides that development is prohibited are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

e) Any development standards applying to the land subject of this certificate that fix minimum land dimensions for the erection of a dwelling-house and, if so, the minimum land dimensions so fixed are detailed in the relevant section of the plan or instrument. Reference should be made to either Attachment 2 to this certificate or the appropriate section(s) of the attached copy of the plan or instrument. In addition, certain Council development control plans may impose minimum development standards for the creation of allotments and/or minimum site area and dimensions for the erection of a dwelling-house.

For further information about items a), b), c), d) and e) above, contact Council's Environmental Planning Section on (02) 4645 4842.

f) The land subject of this certificate does not include or comprise critical habitat.

g) The land subject of this certificate is not in a conservation area (however described).

h) No item of environmental heritage (however described) is situated on the land subject of this certificate.

PART 2A – Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

None

PART 3 – Complying development

(1) The land subject of this certificate is land on which complying development may be carried out under the following codes for complying development in accordance with the provisions of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

Housing Alterations Code

General Commercial and Industrial Code

Subdivisions Code

General Development Code

Demolition Code

Please note that reference should also be made to the relevant parts of this policy for the general requirements for complying development and to the relevant codes which may also include provisions relating to zoning, lot size etc.

The land subject of this certificate is land on which no complying development may be carried out under the following codes for complying development because of the provisons of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

General Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy)

Rural Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy or unless complying development is carried out on the part of the lot to which clause 1.19 or 1.17A of this policy does not apply)

(2) For codes identified above as being those under which no complying development may be carried out under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, this is because of the following provisions of clauses 1.17A (c) and (d) and 1.19 of this policy:

The land is reserved for a public purpose in an environmental planning instrument.

PART 4 – Coastal protection

The land subject of this certificate is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that Council has been notified by the Department of Public Works.

PART 5 – Mine subsidence

The land subject of this certificate is not within a proclaimed Mine Subsidence District within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

PART 6 – Road widening and road realignment

The land subject of this certificate is affected by road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993, an environmental planning instrument or a resolution of Council.

PART 7 – Council and other public authority policies on hazard risk restrictions

a) Council has adopted a policy with respect to all land within the Campbelltown City local government area with unusual site conditions. This policy restricts the development of land where extensive earthworks and/or filling has been carried out. Land, the development of

which is restricted by this policy, has a restriction as to user placed on the title of the land stating the details of any restriction. Building lots can be affected by excessive land gradient, filling, reactive or dispersive soils, overland flow and/or mine subsidence. Buildings, structures or site works may require specific structural design to ensure proper building construction. Consequently, some applications may require the submission of structural design details and geotechnical reports. It is suggested that prior to lodging an application, enquiries be made to Council's Planning and Environment Division to ascertain any specific requirements.

b) Council has adopted by resolution the certified Campbelltown LGA Bush Fire Prone Land Map. This map identifies bush fire prone land within the Campbelltown City local government area as defined in section 4(1) of the Act. Where the land subject of this certificate is identified as bush fire prone land, the document entitled "Planning for Bush Fire Protection" prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and dated December 2006 should be consulted with regards to possible restrictions on the development of the land because of the likelihood of bushfire.

c) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of tidal inundation.

d) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of acid sulphate soils.

e) Council has adopted by resolution a policy on contaminated land which may restrict the development of the land subject of this certificate. This policy is implemented when zoning or land use changes are proposed on lands which have previously been used for certain purposes. Council records do not have sufficient information about previous use of this land to determine whether the land is contaminated. Consideration of Council's adopted policy and the application of provisions under relevant State legislation is warranted.

PART 7A – Flood related development controls information

(1) Development on all or part of the land subject of this certificate for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related controls.

(2) Development on all or part of the land subject of this certificate for any other purpose is subject to flood related development controls.

(3) Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

Please note that some additional information regarding flooding and flood related development controls may be provided as advice under section 149(5) of the Act.

PART 8 – Land reserved for acquisition

An environmental planning instrument, deemed environmental planning instrument or draft environmental planning instrument applying to the land subject of this certificate provides for the acquisition of all or part of the land by a public authority, as referred to in section 27 of the Act.

PART 9 – Contribution plans

The following contribution plan(s) apply to the land subject of this certificate:

Campbelltown City Council Section 94A Development Contributions Plan

For further information about these contribution plans, contact Council's Environmental Planning Section on (02) 4645 4196.

PART 9A – Biodiversity certified land

The land subject of this certificate is not biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995).

PART 10 – Biobanking agreement

The land subject of this certificate is not land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only in so far as Council has been notified of the existence of any such agreement by the Director-General of the Department of Environment, Climate Change and Water).

PART 11 – Bush fire prone land

Some of the land subject of this certificate has been identified as bush fire prone land on the Campbelltown LGA Bush Fire Prone Land Map that has been certified by the Commissioner of the New South Wales Rural Fire Service.

Please note that in accordance with section 66 of the Rural Fires Act 1997 and relevant regulations, a Bush Fire Hazard Reduction Notice may have been issued on this land. It is recommended that advice be obtained from the Macarthur Zone Rural Fire Service.

PART 12 – Property vegetation plans

No property vegetation plan applies to the land subject of this certificate as the whole of the Campbelltown City local government area is excluded from the operation of the Native Vegetation Act 2003.

PART 13 – Orders under Trees (Disputes Between Neighbours) Act 2006

No order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land subject of this certificate (but only to the extent that Council has been notified of any such orders).

PART 14 – Directions under Part 3A

No direction, in force under section 75P(2)(c1) of the Act, that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land subject of this certificate under Part 4 of the Act does not have effect, has been issued by the Minister.

PART 15 – Site compatibility certificates and conditions for seniors housing

a) No current site compatibility certificate (seniors housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

b) No conditions of consent to a development application, granted after 11 October 2007, of the kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed in respect of proposed development on the land subject of this certificate.

PART 16 – Site compatibility certificates for infrastructure

No valid site compatibitlity certificate (infrastructure), of which Council is aware, exisits in respect of proposed development on the land subject of this certificate.

PART 17 – Site compatibility certificates and conditions for affordable rental housing

(1) No current site compatibitlity certificate (affordable rental housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

(2) No conditions of consent to a development application of the kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed in respect of proposed development on the land subject of this certificate.

Matters prescribed by section 59(2) of the Contaminated Land Management Act 1997

(a) The land subject of this certificate is not significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) The land subject of this certificate is not subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) The land subject of this certificate is not the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) The land subject of this certificate is not subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) The land subject of this certificate is not the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 provided to Council.

INFORMATION PROVIDED UNDER SECTION 149(5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

All properties within the Campbelltown City local government area may be affected by flooding caused by overland flow or local topography. Applicants will need to make their own assessment of the risk associated with these matters. For more information, contact Council's Flood Mitigation and Drainage Section in writing.

Council has received a copy of the map "Salinity Potential in Western Sydney - 2002" from the Department of Infrastructure, Planning and Natural Resources (DIPNR). This map classifies the land within the Campbelltown City local government area as having either known salinity, high salinity potential, moderate salinity potential or low salinity potential. Salinity issues may be of relevance to any development of the land subject of this certificate. For further information, contact the Department of Infrastructure, Planning and Natural Resources (www.dipnr.nsw.gov.au).

It should be noted that the Commonwealth Department of Transport and Regional Development has released a document titled "Preliminary Flight Paths" purporting to provide preliminary information on jet aircraft flight paths and flight zones for each of the design options for the Second Sydney Airport Proposals. Some of the flight paths and flight zones shown in this document may, if implemented, impact upon the environment in the vicinity of the land subject of this certificate. Further enquiries in respect of this document should be directed initially to the Commonwealth Department of Transport and Regional Development.

The land subject of this certificate has a boundary to a controlled access road.

Council has resolved to prepare a comprehensive Local Environmental Plan for the City of Campbelltown in accordance with relevant statutory requirements. For more information, contact Council's Environmental Planning Section on (02) 4645 4563.

The following draft development control plans (DCPs), that have been placed on exhibition by Council but which have not yet come into effect, apply to the land subject of this certificate:

Draft Campbelltown (Sustainable City) DCP 2011 Volume 1 (Stage 4)

Draft DCP No.102 - Non Urban Subdivision and Development Standards

For further information about these draft development control plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Jeff Lawrence, per
Director Planning and Environment

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 1 (a)—Rural A Zone

(1) **What land is within Zone 1 (a)?**
Land is within Zone 1 (a) if it is shown coloured buff on the map.

(2) **What is the zone objective and what effect does it have?**
The objective of this zone is to identify land that constraints make unsuitable for urban use so that it can be put to long-term agricultural use.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with the objective of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development must not be carried out on land within this zone without consent.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

agriculture; bushfire hazard reduction; drainage; dual occupancies (attached); dwelling houses; forestry; mines; utility installations.

(5) **What development is prohibited?**
Development which is not included in subclause (4) is prohibited on land within this zone.

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 5 (b)—Special Uses Arterial Roads Zone

(1) **What land is within Zone 5 (b)?**
Land is within Zone 5 (b) if it is shown coloured light grey on the map.

(2) **What are the zone objectives and what effect do they have?**
The objectives of this zone are:

(a) to identify land required for existing or proposed arterial roads (including the widening of existing roads), and

(b) to control vehicular access to and from roads in the zone so as not to inhibit the free flow of traffic on arterial roads, and

(c) to allow for the development of such land prior to its acquisition for road purposes.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with one or more of the objectives of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development may be carried out on land within this zone without consent for the purpose of:

drainage; roads; utility installations.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

bushfire hazard reduction (otherwise than in accordance with a bush fire management plan prepared under the *Rural Fires Act 1997*); underground mining.

(5) **What development is prohibited?**
Development is prohibited on land within this zone if it is not included in subclause (3) or (4).

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 6 (b)—Regional Open Space Zone

(1) **What land is within Zone 6 (b)?**
Land is within Zone 6 (b) if it is shown coloured mid green on the map.

(2) **What are the zone objectives and what effect do they have?**
The objectives of this zone are:

(a) to identify land which has been acquired for, or is to be acquired for, regional open space, and

(b) to preserve and manage regional open space for conservation and recreational purposes for the benefit of the Sydney region.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with one or more of the objectives of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development may be carried out on land within this zone without consent for the purpose of:

drainage; utility installations.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

bushfire fighting establishments; bushfire hazard reduction (otherwise than in accordance with a bush fire management plan prepared under the *Rural Fires Act 1997*); car parking; community facilities; recreation areas; recreation facilities; roads; underground mining.

(5) **What development is prohibited?**
Development is prohibited on land within this zone if it is not included in subclause (3) or (4).

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 2

Campbelltown (Urban Area) Local Environmental Plan 2002

32 Subdivision generally

(1) Land to which this plan applies may be subdivided only with development consent.

(2) Consent must not be granted to the subdivision of land traversed by a zone boundary unless the boundaries of lots so created correspond generally with the boundaries between the zones as shown on the map.

(3) Where the subdivision of land would result in the opening of a new road, the road must accord with any pattern of proposed roads indicated on the map unless the consent authority is satisfied that the road will provide adequate access to adjoining land and fulfils the objectives of the road pattern indicated on the map.

33 Subdivision in rural and environmental protection zones

(1) Consent must not be granted to the subdivision of land in a zone specified in the following Table unless the area of any lot created is equal to or greater than that shown opposite that zone in that Table.

Table

Zone	Lot
1 (a)	40 hectares
1 (d)	40 hectares
7 (d1)	100 hectares
7 (d4)	2 hectares
7 (d5)	1 hectare
7 (d6)	0.4 hectare

(2) Despite subclause (1), consent may be granted to the subdivision of land in any of the zones specified in the Table so as to create lots with areas less than those set out in that Table if:

(a) the consent authority is satisfied that the purpose of the subdivision is to create a lot or lots to be used for the purpose of a public utility undertaking or public reserve, or

(b) the consent authority is satisfied that the purpose of the subdivision is to align the boundaries of those lots with the boundaries of a zone so specified.

(2) For the purposes of subclause (2), an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for that zone or the part of that zone within which the existing holding is located.

34 Dual occupancies in certain zones

(1) If two dwellings are situated on the same lot within Zone 2 (b):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 350 square metres.

(2) If two dwellings are situated on the same lot or an existing holding within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than the area for a lot in the zone shown in the Table in clause 33.

35 Erection of dwelling houses or dual occupancies in certain zones

(1) Consent must not be granted to the erection of a dwelling house or a dual occupancy (attached) on land within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6) unless:

(a) the area of the lot on which it is to be erected is equal to or greater than the area shown opposite that zone in the Table in clause 33, and

(b) only one dwelling house or one dual occupancy (attached) is to be erected on the lot.

(2) Despite subclause (1), consent may be granted to the erection of one dwelling house or one dual occupancy (attached) on land within Zone 7 (d4) if:

(a) that land constituted the whole of an existing holding, or

(b) the land is a lot created pursuant to clause 33 (2), but not a lot to be used for the purpose of a public utility undertaking or public reserve.

(3) For the purposes of this clause, an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for the part of that zone within which the existing holding is located.

42C Minto Renewal Project

(1) This clause applies to certain land at Minto, as shown distinctively coloured, edged heavy black and lettered on Sheet 1 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 14)".

(2) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies for one or more of the following purposes:

(a) bushfire fighting establishments,

(b) bushfire hazard reduction,

(c) car parking,

(d) community facilities,

(e) recreation areas,

(f) recreation facilities,

(g) roads,

(h) underground mining.

(3) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies that is within Zone 2 (b) for the purpose of integrated housing development.

(4) If 2 dwellings are situated on the same lot on land that is within Zone 2 (b) on the land to which this clause applies:

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* is prohibited,
unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 300 square metres.

(5) In this clause, *integrated housing development* means development that includes subdivision and that results in:

(a) there being 3 or more dwellings, each on a separate lot, and

(b) the average area of all those separate lots with dwellings is not less than 225 square metres.

Division 2A Edmondson Park Urban Release Area Precinct

51H Density controls

(1) The consent authority must not grant consent to the erection of dwellings on land within the Edmondson Park Urban Release Area Precinct unless the net site density applying in relation to the proposed dwellings on the land is not less than the prescribed net site density applying in relation to the land.

(2) The consent authority must not grant consent to the subdivision of land within the Edmondson Park Urban Release Area Precinct unless the consent authority is of the opinion that the proposal is not inconsistent with the prescribed net site density applying in relation to the land.

(3) Despite subclause (1), the consent authority may consent to the erection of dwellings on land within Zone 2 (c), 3 (a) or 3 (c) even though the net site density applying in relation to the proposed dwellings is less than the prescribed net site density if:

(a) the proposed net site density is not less than the prescribed net site density (if any) that would apply if the boundary of the land was located 60 metres away in at least one direction, and

(b) the consent authority is satisfied that the proposed density is required:

(i) to incorporate an efficient road layout in connection with the proposed development, or
(ii) to achieve the optimum development of the land in a planning and urban design sense.

(4) *State Environmental Planning Policy No 1—Development Standards* does not apply in relation to any prescribed net site density.

(5) In this clause:

net site density, in relation to dwellings, means the ratio that the number of dwellings concerned bears to the area occupied by those dwellings, excluding any public roads, open space or drainage corridors.

prescribed net site density, in relation to land, means the minimum net site density applying in relation to dwellings on the land, as identified on Sheet 2 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 12)".

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

campbelltown
city council

Issue Date: 20 April 2012
Application Number: 201201114
Receipt Number: 1964209

Globalx Information Services
DX 1239
SYDNEY NSW

Your Reference: 570849-11012

PLANNING CERTIFICATE UNDER SECTION 149 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Section 149 Planning Certificate phone enquiries: (02) 4645 4560.

Property Address: Lot 1 Cambridge Avenue
GLENFIELD NSW 2167

Property Description: Lot 91 DP 1155962

As at the date of issue, the following matters apply to the land subject of this certificate:

INFORMATION PROVIDED UNDER SECTION 149(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (the Act)

PART 1 – Names of relevant planning instruments and DCPs

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 1(a) - Rural A Zone

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 6(b) - Regional Open Space Zone

(1) In addition to the environmental planning instrument(s) named above, the following planning instruments also apply to the carrying out of development on the land subject of this certificate:

Local environmental plans (LEPs) and deemed environmental planning instruments

Campbelltown LEP No.209 – Exempt Development

For further information about these local environmental plans and deemed environmental planning instruments, contact Council's Environmental Planning Section on (02) 4645 4842.

State environmental planning policies (SEPPs)

SEPP No.1 – Development Standards

SEPP No.4 – Development Without Consent and Miscellaneous Complying Development

SEPP No.6 – Number of Storeys in a Building

SEPP No.21 – Caravan Parks

SEPP No.22 – Shops and Commercial Premises

SEPP No.30 – Intensive Agriculture

SEPP No.33 – Hazardous and Offensive Development

SEPP No.44 – Koala Habitat Protection

SEPP No.50 – Canal Estate Development

SEPP No.55 – Remediation of Land

SEPP No.60 – Exempt and Complying Development

SEPP No.64 – Advertising and Signage

SEPP No.65 – Design Quality of Residential Flat Buildings

SEPP No.70 – Affordable Housing (Revised Schemes)

SEPP No.19 - Bushland in Urban Areas

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Temporary Structures and Places of Public Entertainment) 2007

SEPP (Infrastructure) 2007

SEPP (Exempt and Complying Development Codes) 2008

SEPP (Affordable Rental Housing) 2009

SEPP (State and Regional Development) 2011

Greater Metropolitan REP No.2 - Georges River Catchment

For further information about these State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(2) The following proposed environmental planning instruments, which are or have been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified Council that the making of the proposed instrument has been deferred indefinately or has not been approved), apply to the carrying out of development on the land subject of this certificate:

Draft local environmental plans (LEPs)

None

For further information about these draft local environmental plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Draft State environmental planning policies (SEPPs)

None

For further information about these draft State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(3) The following development control plans (DCPs) apply to the carrying out of development on the land subject of this certificate:

Campbelltown DCP No.82 – Religious Establishment Policy

Campbelltown DCP No.87 – Public Notification & Public Exhibition Policy

Campbelltown DCP No.96 – The Provision of Parenting Facilities

DCP No.99 – Advertising Signs

DCP No.107 – Siting of Communication Facilities (Telecommunication Towers)

Campbelltown DCP No.114 – Trees

Campbelltown DCP No.122 – Restricted Premises

Campbelltown Sex Industry DCP 2003

Campbelltown (Sustainable City) DCP 2009 Volume 2

Campbelltown (Sustainable City) DCP 2009 Volume 1 (Parts 1-8)

Campbelltown DCP No.120 - Parking of Commercial Vehicles and Trucks Within Residential, Scenic Protection and Rural Areas

For further information about these development control plans, contact Council's Environmental Planning Section on (02) 4645 4842. Please note that the names of any draft development control plans that apply to the land subject of this certificate, that have been placed on exhibiton by Council but have not yet come into effect, are provided as advice under section 149(5) of the Act.

PART 2 – Zoning and land use under relevant LEPs

a) The following zone(s) apply to the land subject of this certificate:

1(a) - Rural A Zone

6(b) - Regional Open Space Zone

b) The purposes for which the plan or instrument provides that development may be carried out without the need for development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and Campbelltown LEP No.209 – Exempt Development allow certain types of development to be carried out as exempt development within the Campbelltown City local government area.

c) The purposes for which the plan or instrument provides that development may not be carried out except with development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and SEPP No.60 – Exempt and Complying Development allow certain types of development to be carried out as complying development within the Campbelltown City local government area after a complying development certificate has been obtained from Council or from an accredited certifier.

d) The purposes for which the plan or instrument provides that development is prohibited are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

e) Any development standards applying to the land subject of this certificate that fix minimum land dimensions for the erection of a dwelling-house and, if so, the minimum land dimensions so fixed are detailed in the relevant section of the plan or instrument. Reference should be made to either Attachment 2 to this certificate or the appropriate section(s) of the attached copy of the plan or instrument. In addition, certain Council development control plans may impose minimum development standards for the creation of allotments and/or minimum site area and dimensions for the erection of a dwelling-house.

For further information about items a), b), c), d) and e) above, contact Council's Environmental Planning Section on (02) 4645 4842.

f) The land subject of this certificate does not include or comprise critical habitat.

g) The land subject of this certificate is not in a conservation area (however described).

h) No item of environmental heritage (however described) is situated on the land subject of this certificate.

PART 2A – Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

None

PART 3 – Complying development

(1) The land subject of this certificate is land on which complying development may be carried out under the following codes for complying development in accordance with the provisions of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

Housing Alterations Code

General Commercial and Industrial Code

Subdivisions Code

General Development Code

Demolition Code

Please note that reference should also be made to the relevant parts of this policy for the general requirements for complying development and to the relevant codes which may also include provisions relating to zoning, lot size etc.

The land subject of this certificate is land on which no complying development may be carried out under the following codes for complying development because of the provisons of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

General Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy)

Rural Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy or unless complying development is carried out on the part of the lot to which clause 1.19 or 1.17A of this policy does not apply)

(2) For codes identified above as being those under which no complying development may be carried out under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, this is because of the following provisions of clauses 1.17A (c) and (d) and 1.19 of this policy:

The land is reserved for a public purpose in an environmental planning instrument.

PART 4 – Coastal protection

The land subject of this certificate is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that Council has been notified by the Department of Public Works.

PART 5 – Mine subsidence

The land subject of this certificate is not within a proclaimed Mine Subsidence District within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

PART 6 – Road widening and road realignment

The land subject of this certificate is not affected by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993, any environmental planning instrument or any resolution of Council.

PART 7 – Council and other public authority policies on hazard risk restrictions

a) Council has adopted a policy with respect to all land within the Campbelltown City local government area with unusual site conditions. This policy restricts the development of land where extensive earthworks and/or filling has been carried out. Land, the development of which is restricted by this policy, has a restriction as to user placed on the title of the land stating the details of any restriction. Building lots can be affected by excessive land gradient, filling, reactive or dispersive soils, overland flow and/or mine subsidence. Buildings, structures or site works may require specific structural design to ensure proper building construction. Consequently, some applications may require the submission of structural design details and geotechnical reports. It is suggested that prior to lodging an application, enquiries be made to Council's Planning and Environment Division to ascertain any specific requirements.

b) Council has adopted by resolution the certified Campbelltown LGA Bush Fire Prone Land Map. This map identifies bush fire prone land within the Campbelltown City local government area as defined in section 4(1) of the Act. Where the land subject of this certificate is identified as bush fire prone land, the document entitled "Planning for Bush Fire Protection" prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and dated December 2006 should be consulted with regards to possible restrictions on the development of the land because of the likelihood of bushfire.

c) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of tidal inundation.

d) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of acid sulphate soils.

e) Council has adopted by resolution a policy on contaminated land which may restrict the development of the land subject of this certificate. This policy is implemented when zoning or land use changes are proposed on lands which have previously been used for certain purposes. Consideration of Council's adopted policy and the application of provisions under relevant State legislation is warranted.

PART 7A – Flood related development controls information

(1) Development on all or part of the land subject of this certificate for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related controls.

(2) Development on all or part of the land subject of this certificate for any other purpose is subject to flood related development controls.

(3) Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

Please note that some additional information regarding flooding and flood related development controls may be provided as advice under section 149(5) of the Act.

PART 8 – Land reserved for acquisition

An environmental planning instrument, deemed environmental planning instrument or draft environmental planning instrument applying to the land subject of this certificate provides for the acquisition of all or part of the land by a public authority, as referred to in section 27 of the Act.

PART 9 – Contribution plans

The following contribution plan(s) apply to the land subject of this certificate:

Campbelltown City Council Section 94A Development Contributions Plan

For further information about these contribution plans, contact Council's Environmental Planning Section on (02) 4645 4196.

PART 9A – Biodiversity certified land

The land subject of this certificate is not biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995).

PART 10 – Biobanking agreement

The land subject of this certificate is not land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only in so far as Council has been notified of the existence of any such agreement by the Director-General of the Department of Environment, Climate Change and Water).

PART 11 – Bush fire prone land

Some of the land subject of this certificate has been identified as bush fire prone land on the Campbelltown LGA Bush Fire Prone Land Map that has been certified by the Commissioner of the New South Wales Rural Fire Service.

Please note that in accordance with section 66 of the Rural Fires Act 1997 and relevant regulations, a Bush Fire Hazard Reduction Notice may have been issued on this land. It is recommended that advice be obtained from the Macarthur Zone Rural Fire Service.

PART 12 – Property vegetation plans

No property vegetation plan applies to the land subject of this certificate as the whole of the Campbelltown City local government area is excluded from the operation of the Native Vegetation Act 2003.

PART 13 – Orders under Trees (Disputes Between Neighbours) Act 2006

No order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land subject of this certificate (but only to the extent that Council has been notified of any such orders).

PART 14 – Directions under Part 3A

No direction, in force under section 75P(2)(c1) of the Act, that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land subject of this certificate under Part 4 of the Act does not have effect, has been issued by the Minister.

PART 15 – Site compatibility certificates and conditions for seniors housing

a) No current site compatibility certificate (seniors housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

b) No conditions of consent to a development application, granted after 11 October 2007, of the kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed in respect of proposed development on the land subject of this certificate.

PART 16 – Site compatibility certificates for infrastructure

No valid site compatibitlity certificate (infrastructure), of which Council is aware, exisits in respect of proposed development on the land subject of this certificate.

PART 17 – Site compatibility certificates and conditions for affordable rental housing

(1) No current site compatibitlity certificate (affordable rental housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

(2) No conditions of consent to a development application of the kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed in respect of proposed development on the land subject of this certificate.

Matters prescribed by section 59(2) of the Contaminated Land Management Act 1997

(a) The land subject of this certificate is not significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) The land subject of this certificate is not subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) The land subject of this certificate is not the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) The land subject of this certificate is not subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) The land subject of this certificate is not the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 provided to Council.

INFORMATION PROVIDED UNDER SECTION 149(5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

All properties within the Campbelltown City local government area may be affected by flooding caused by overland flow or local topography. Applicants will need to make their own assessment of the risk associated with these matters. For more information, contact Council's Flood Mitigation and Drainage Section in writing.

Council is currently undertaking a flood study of the Bow Bowing / Bunbury Curran Creek

Catchment, of which this property is a part. The results of this study will improve Council's understanding of flood behaviour in the catchment, and the flood affectation of all properties will be reassessed when this study is finalised. It is anticipated that the Floodplain Risk Management Plan will be finalised by the end of 2012.

Council has received a copy of the map "Salinity Potential in Western Sydney - 2002" from the Department of Infrastructure, Planning and Natural Resources (DIPNR). This map classifies the land within the Campbelltown City local government area as having either known salinity, high salinity potential, moderate salinity potential or low salinity potential. Salinity issues may be of relevance to any development of the land subject of this certificate. For further information, contact the Department of Infrastructure, Planning and Natural Resources (www.dipnr.nsw.gov.au).

It should be noted that the Commonwealth Department of Transport and Regional Development has released a document titled "Preliminary Flight Paths" purporting to provide preliminary information on jet aircraft flight paths and flight zones for each of the design options for the Second Sydney Airport Proposals. Some of the flight paths and flight zones shown in this document may, if implemented, impact upon the environment in the vicinity of the land subject of this certificate. Further enquiries in respect of this document should be directed initially to the Commonwealth Department of Transport and Regional Development.

The land subject of this certificate does not have a boundary to a controlled access road.

Council has resolved to prepare a comprehensive Local Environmental Plan for the City of Campbelltown in accordance with relevant statutory requirements. For more information, contact Council's Environmental Planning Section on (02) 4645 4563.

The following draft development control plans (DCPs), that have been placed on exhibition by Council but which have not yet come into effect, apply to the land subject of this certificate:

Draft Campbelltown (Sustainable City) DCP 2011 Volume 1 (Stage 4)

For further information about these draft development control plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Jeff Lawrence, per
Director Planning and Environment

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 1 (a)—Rural A Zone

(1) **What land is within Zone 1 (a)?**
Land is within Zone 1 (a) if it is shown coloured buff on the map.

(2) **What is the zone objective and what effect does it have?**
The objective of this zone is to identify land that constraints make unsuitable for urban use so that it can be put to long-term agricultural use.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with the objective of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development must not be carried out on land within this zone without consent.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

agriculture; bushfire hazard reduction; drainage; dual occupancies (attached); dwelling houses; forestry; mines; utility installations.

(5) **What development is prohibited?**
Development which is not included in subclause (4) is prohibited on land within this zone.

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 6 (b)—Regional Open Space Zone

(1) **What land is within Zone 6 (b)?**
Land is within Zone 6 (b) if it is shown coloured mid green on the map.

(2) **What are the zone objectives and what effect do they have?**
The objectives of this zone are:

(a) to identify land which has been acquired for, or is to be acquired for, regional open space, and

(b) to preserve and manage regional open space for conservation and recreational purposes for the benefit of the Sydney region.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with one or more of the objectives of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development may be carried out on land within this zone without consent for the purpose of:

drainage; utility installations.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

bushfire fighting establishments; bushfire hazard reduction (otherwise than in accordance with a bush fire management plan prepared under the *Rural Fires Act 1997*); car parking; community facilities; recreation areas; recreation facilities; roads; underground mining.

(5) **What development is prohibited?**
Development is prohibited on land within this zone if it is not included in subclause (3) or (4).

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 2

Campbelltown (Urban Area) Local Environmental Plan 2002

32 Subdivision generally

(1) Land to which this plan applies may be subdivided only with development consent.

(2) Consent must not be granted to the subdivision of land traversed by a zone boundary unless the boundaries of lots so created correspond generally with the boundaries between the zones as shown on the map.

(3) Where the subdivision of land would result in the opening of a new road, the road must accord with any pattern of proposed roads indicated on the map unless the consent authority is satisfied that the road will provide adequate access to adjoining land and fulfils the objectives of the road pattern indicated on the map.

33 Subdivision in rural and environmental protection zones

(1) Consent must not be granted to the subdivision of land in a zone specified in the following Table unless the area of any lot created is equal to or greater than that shown opposite that zone in that Table.

Table

Zone	Lot
1 (a)	40 hectares
1 (d)	40 hectares
7 (d1)	100 hectares
7 (d4)	2 hectares
7 (d5)	1 hectare
7 (d6)	0.4 hectare

(2) Despite subclause (1), consent may be granted to the subdivision of land in any of the zones specified in the Table so as to create lots with areas less than those set out in that Table if:

(a) the consent authority is satisfied that the purpose of the subdivision is to create a lot or lots to be used for the purpose of a public utility undertaking or public reserve, or

(b) the consent authority is satisfied that the purpose of the subdivision is to align the boundaries of those lots with the boundaries of a zone so specified.

(2) For the purposes of subclause (2), an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for that zone or the part of that zone within which the existing holding is located.

34 Dual occupancies in certain zones

(1) If two dwellings are situated on the same lot within Zone 2 (b):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 350 square metres.

(2) If two dwellings are situated on the same lot or an existing holding within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than the area for a lot in the zone shown in the Table in clause 33.

35 Erection of dwelling houses or dual occupancies in certain zones

(1) Consent must not be granted to the erection of a dwelling house or a dual occupancy (attached) on land within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6) unless:

(a) the area of the lot on which it is to be erected is equal to or greater than the area shown opposite that zone in the Table in clause 33, and

(b) only one dwelling house or one dual occupancy (attached) is to be erected on the lot.

(2) Despite subclause (1), consent may be granted to the erection of one dwelling house or one dual occupancy (attached) on land within Zone 7 (d4) if:

(a) that land constituted the whole of an existing holding, or

(b) the land is a lot created pursuant to clause 33 (2), but not a lot to be used for the purpose of a public utility undertaking or public reserve.

(3) For the purposes of this clause, an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for the part of that zone within which the existing holding is located.

42C Minto Renewal Project

(1) This clause applies to certain land at Minto, as shown distinctively coloured, edged heavy black and lettered on Sheet 1 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 14)".

(2) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies for one or more of the following purposes:

(a) bushfire fighting establishments,

(b) bushfire hazard reduction,

(c) car parking,

(d) community facilities,

(e) recreation areas,

(f) recreation facilities,

(g) roads,

(h) underground mining.

(3) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies that is within Zone 2 (b) for the purpose of integrated housing development.

(4) If 2 dwellings are situated on the same lot on land that is within Zone 2 (b) on the land to which this clause applies:

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 300 square metres.

(5) In this clause, *integrated housing development* means development that includes subdivision and that results in:

(a) there being 3 or more dwellings, each on a separate lot, and

(b) the average area of all those separate lots with dwellings is not less than 225 square metres.

Division 2A Edmondson Park Urban Release Area Precinct

51H Density controls

(1) The consent authority must not grant consent to the erection of dwellings on land within the Edmondson Park Urban Release Area Precinct unless the net site density applying in relation to the proposed dwellings on the land is not less than the prescribed net site density applying in relation to the land.

(2) The consent authority must not grant consent to the subdivision of land within the Edmondson Park Urban Release Area Precinct unless the consent authority is of the opinion that the proposal is not inconsistent with the prescribed net site density applying in relation to the land.

(3) Despite subclause (1), the consent authority may consent to the erection of dwellings on land within Zone 2 (c), 3 (a) or 3 (c) even though the net site density applying in relation to the proposed dwellings is less than the prescribed net site density if:

(a) the proposed net site density is not less than the prescribed net site density (if any) that would apply if the boundary of the land was located 60 metres away in at least one direction, and

(b) the consent authority is satisfied that the proposed density is required:

(i) to incorporate an efficient road layout in connection with the proposed development, or
(ii) to achieve the optimum development of the land in a planning and urban design sense.

(4) *State Environmental Planning Policy No 1—Development Standards* does not apply in relation to any prescribed net site density.

(5) In this clause:

net site density, in relation to dwellings, means the ratio that the number of dwellings concerned bears to the area occupied by those dwellings, excluding any public roads, open space or drainage corridors.

prescribed net site density, in relation to land, means the minimum net site density applying in relation to dwellings on the land, as identified on Sheet 2 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 12)".

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 2

Campbelltown (Urban Area) Local Environmental Plan 2002

32 Subdivision generally

(1) Land to which this plan applies may be subdivided only with development consent.

(2) Consent must not be granted to the subdivision of land traversed by a zone boundary unless the boundaries of lots so created correspond generally with the boundaries between the zones as shown on the map.

(3) Where the subdivision of land would result in the opening of a new road, the road must accord with any pattern of proposed roads indicated on the map unless the consent authority is satisfied that the road will provide adequate access to adjoining land and fulfils the objectives of the road pattern indicated on the map.

33 Subdivision in rural and environmental protection zones

(1) Consent must not be granted to the subdivision of land in a zone specified in the following Table unless the area of any lot created is equal to or greater than that shown opposite that zone in that Table.

Table

Zone	Lot
1 (a)	40 hectares
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7 (d5)	1 hectare
7 (d6)	0.4 hectare

(2) Despite subclause (1), consent may be granted to the subdivision of land in any of the zones specified in the Table so as to create lots with areas less than those set out in that Table if:

(a) the consent authority is satisfied that the purpose of the subdivision is to create a lot or lots to be used for the purpose of a public utility undertaking or public reserve, or

(b) the consent authority is satisfied that the purpose of the subdivision is to align the boundaries of those lots with the boundaries of a zone so specified.

(2) For the purposes of subclause (2), an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for that zone or the part of that zone within which the existing holding is located.

34 Dual occupancies in certain zones

(1) If two dwellings are situated on the same lot within Zone 2 (b):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 350 square metres.

(2) If two dwellings are situated on the same lot or an existing holding within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than the area for a lot in the zone shown in the Table in clause 33.

35 Erection of dwelling houses or dual occupancies in certain zones

(1) Consent must not be granted to the erection of a dwelling house or a dual occupancy (attached) on land within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6) unless:

(a) the area of the lot on which it is to be erected is equal to or greater than the area shown opposite that zone in the Table in clause 33, and

(b) only one dwelling house or one dual occupancy (attached) is to be erected on the lot.

(2) Despite subclause (1), consent may be granted to the erection of one dwelling house or one dual occupancy (attached) on land within Zone 7 (d4) if:

(a) that land constituted the whole of an existing holding, or

(b) the land is a lot created pursuant to clause 33 (2), but not a lot to be used for the purpose of a public utility undertaking or public reserve.

(3) For the purposes of this clause, an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for the part of that zone within which the existing holding is located.

42C Minto Renewal Project

(1) This clause applies to certain land at Minto, as shown distinctively coloured, edged heavy black and lettered on Sheet 1 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 14)".

(2) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies for one or more of the following purposes:

(a) bushfire fighting establishments,

(b) bushfire hazard reduction,

(c) car parking,

(d) community facilities,

(e) recreation areas,

(f) recreation facilities,

(g) roads,

(h) underground mining.

(3) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies that is within Zone 2 (b) for the purpose of integrated housing development.

(4) If 2 dwellings are situated on the same lot on land that is within Zone 2 (b) on the land to which this clause applies:

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 300 square metres.

(5) In this clause, *integrated housing development* means development that includes subdivision and that results in:

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(3) Despite subclause (1), the consent authority may consent to the erection of dwellings on land within Zone 2 (c), 3 (a) or 3 (c) even though the net site density applying in relation to the proposed dwellings is less than the prescribed net site density if:

(a) the proposed net site density is not less than the prescribed net site density (if any) that would apply if the boundary of the land was located 60 metres away in at least one direction, and

(b) the consent authority is satisfied that the proposed density is required:

(i) to incorporate an efficient road layout in connection with the proposed development, or
(ii) to achieve the optimum development of the land in a planning and urban design sense.

(4) *State Environmental Planning Policy No 1—Development Standards* does not apply in relation to any prescribed net site density.

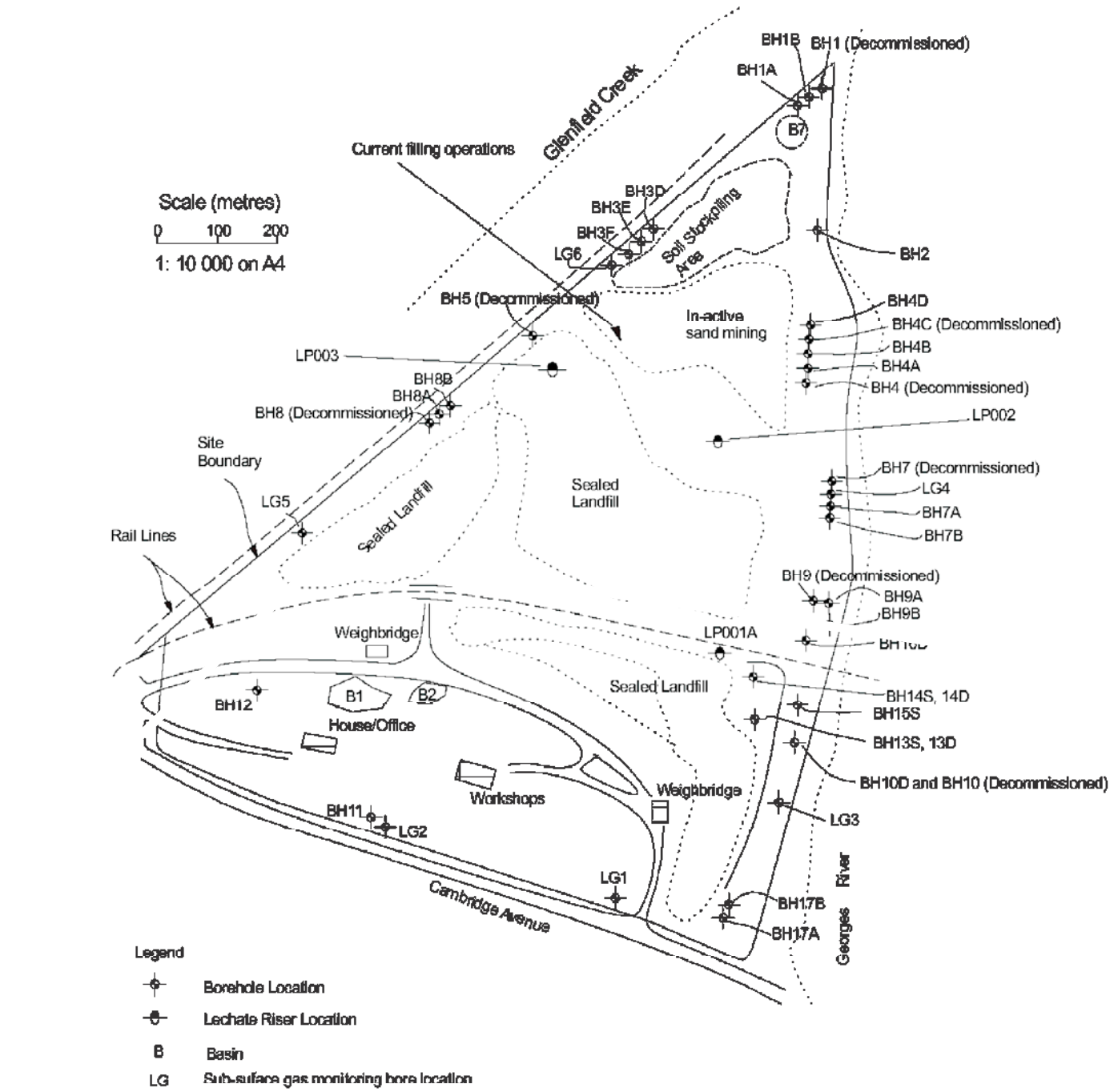
(5) In this clause:

net site density, in relation to dwellings, means the ratio that the number of dwellings concerned bears to the area occupied by those dwellings, excluding any public roads, open space or drainage corridors.

prescribed net site density, in relation to land, means the minimum net site density applying in relation to dwellings on the land, as identified on Sheet 2 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 12)".

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Appendix C
Plan from 2007 CES Report showing Borehole Locations



Title: Site Plan showing groundwater bore and subsurface gas locations	CES Project ID: CES031101-LAK	Scale: 1:10 000	Paper size: A4
CONSULTING EARTH SCIENTISTS 1/111 Moore St, Leichhardt NSW 2040 ph: 02 8585 4888 fax: 02 9550 9566	Date: 06/11/2007	Prepared by: KW Checked by:	Figure number: 2

Source: NearMap

CONSULTING EARTH SCIENTISTS Suite 3, Level 1 55 Grandview Street, Pymble, NSW, 2073 ph 8569 2200 fax 9983 0582	Title: Appendix C Taken from earlier CES report showing borehole locations	CES Project ID: CES120413-LAK Prepared By: T.Goodbody	Date: 25/05/2012 Checked By: D.Johnson

Attachment 2.7

global environmental solutions

Rezoning

Glenfield Waste Site

Noise Impact Assessment

Report Number 630.10711-R1

1 April 2015

Environmental Property Services
Level 1, 19 Stockton Street
NELSON BAY NSW 2315

Version: Revision 1

Rezoning

Glenfield Waste Site

Noise Impact Assessment

PREPARED BY:

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This report has been prepared by SLR Consulting Australia Pty Ltd
with all reasonable skill, care and diligence, and taking account of the
timescale and resources allocated to it by agreement with the Client.
Information reported herein is based on the interpretation of data collected,
which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Environmental Property Services.
No warranties or guarantees are expressed or should be inferred by any third parties.
This report may not be relied upon by other parties without written consent from SLR Consulting.

SLR Consulting disclaims any responsibility to the Client and others
in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
630.10711-R1	Revision 1	1 April 2015	Martin Davenport	Nathan Archer	Nathan Archer
630.10711-R1	Revision 0	8 October 2014	Katie Teyhan	Martin Davenport	Katie Teyhan

Executive Summary

SLR has undertaken a noise assessment relating to the proposed rezoning of the southern parcel of the GWS site located at Cambridge Avenue, Glenfield NSW.

The aim of this assessment is to assess the potential noise impacts from land use changes associated with the rezoning on surrounding sensitive receptors.

The noise assessment has been prepared with reference to Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in general accordance with the Environment Protection Authority's (EPA) *NSW Industrial Noise Policy* (INP) (EPA, 2000) and the associated Application Notes (EPA, last updated July 2012).

Residences surrounding the development have been classified for the purposes of this noise assessment as 'suburban'. The 'suburban' classification is not determined in relation to the planning zone of these residences but is an acoustical classification. The ambient noise at these locations is influenced by road traffic noise and (to a lesser extent) noise from existing industrial facilities.

The operational amenity noise criteria (presented in **Table 6**) have been determined based on measured noise levels in the vicinity of the subject site and with reference to the INP.

For the purpose of this noise assessment the amenity noise criteria has been adopted to assess potential noise impacts for the proposed medium to long-term land use where multiple developments are proposed. The intrusive and sleep disturbance impacts of proposed developments for the medium to long-term land use would need to be assessed when more information is known about the developments that will occupy the site.

A computer model was used to predict noise emissions from the proposed development. Noise modelling was undertaken using SoundPLAN v7.3 software, developed by Braunstein and Berndt Gmbh in Germany. Noise modelling methodology and assumptions are outlined in **Section 7.1**. The proposed land use strategy is for typically "low noise" industrial use with a focus on warehousing and logistics. Notwithstanding this a hypothetical industrial estate consisting of "low" and "medium" noise generating industrial sites distributed evenly across the subject site was utilised in the modelling process.

Predicted noise levels at neighbouring noise-sensitive locations representative of potential noise levels likely to be experienced once industrial developments are in use at the GWS site are provided in **Table 12**.

Predicted noise emission levels (shown in **Table 12**) for a hypothetical industrial estate are predicted to comply with the relevant noise goals during day, evening and night-time periods at all existing residential locations considered under calm and prevailing weather conditions. Furthermore, no specific noise mitigation measures, besides the existing mound and fence, have been included in the noise model. It is possible that actual noise emissions from the proposed industrial estate would be less than those predicted. Predicted noise levels could be greatly reduced with judicious planning along with the use of equipment incorporating 'quiet' engineering design, the addition of acoustically designed enclosures, noise barriers or using management techniques. Further discussion in this regard is provided in **Section 8**. It is also possible that considerable screening of acoustically significantly activities would be provided by buildings once the site is developed.

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APPENDICES

Appendix A	Statistical Ambient Noise Levels

1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Environmental Property Services (EPS) on behalf of Glenfield Waste Services (GWS) to undertake a noise assessment relating to the proposed rezoning of the southern parcel of the GWS site located at Cambridge Avenue, Glenfield NSW.

The majority of the southern parcel of the GWS land located in the Campbelltown City Council's Local Government Area is *Zone 1(a) – Rural A Zone* in the Campbelltown (Urban area) Local Environmental Plan 2002 (LEP).

The site's rural zone reflects the historical rural land uses in the area. The local area is now an established urban area comprising residential, industrial, commercial, education, open space and major public infrastructure land uses.

The aim of this assessment is to assess the potential noise impacts from land use changes associated with the rezoning on surrounding sensitive receptors.

This report revision has been prepared in response to Campbelltown City Council comments.

The noise assessment has been prepared with reference to Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in general accordance with the Environment Protection Authority's (EPA) *NSW Industrial Noise Policy* (INP) (EPA, 2000) and the associated Application Notes (EPA, last updated July 2012).

2 PROJECT DESCRIPTION

2.1 Site Details

The GWS site is located at Cambridge Avenue Glenfield NSW. The GWS northern parcel of land is located in Liverpool City Council's Local Government Area. The GWS southern parcel of land is located in the Campbelltown City Council's Local Government Area. The current proposal is to demonstrate the potential impacts of rezoning the majority of the southern parcel of land.

The southern parcel of land (the Site) is approximately 60 hectares and is bounded by the East Hills Railway along its northern boundary, Georges River at the eastern boundary and to the south by the Glenfield residential area. The site locality and site location are shown in **Figure 1** and **Figure 2** respectively.

Figure 1 Site Locality

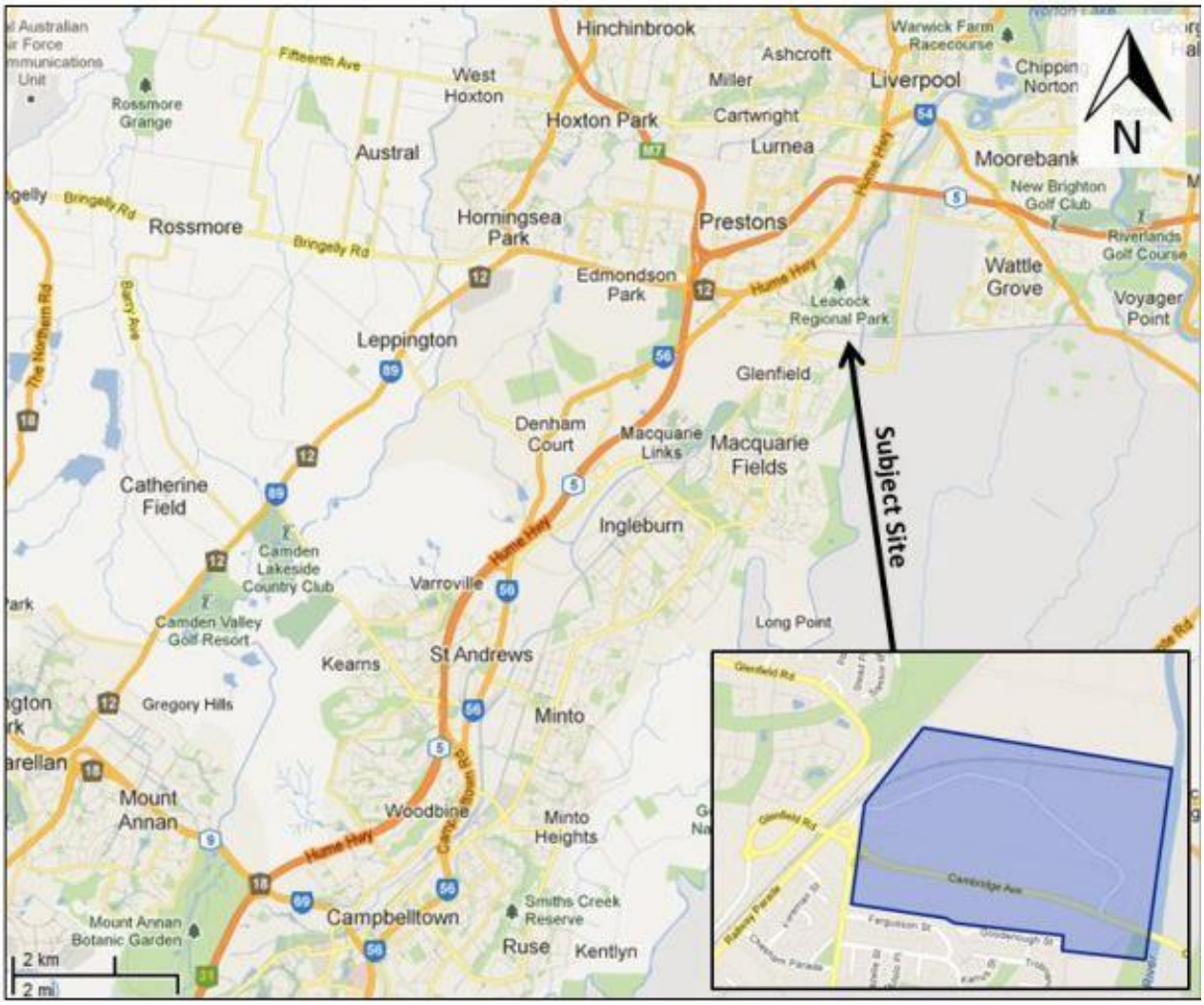
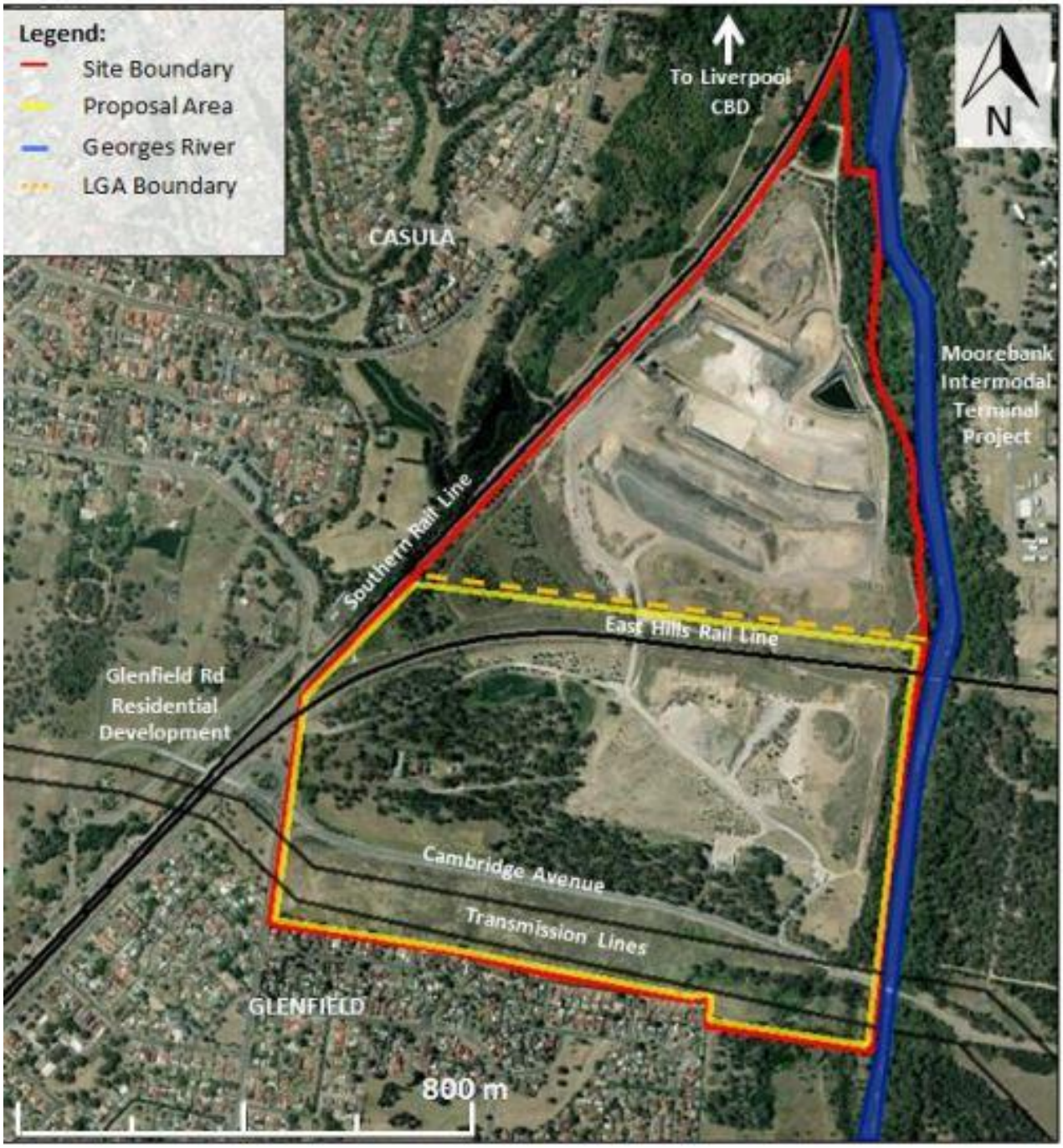


Figure 2 Site Location



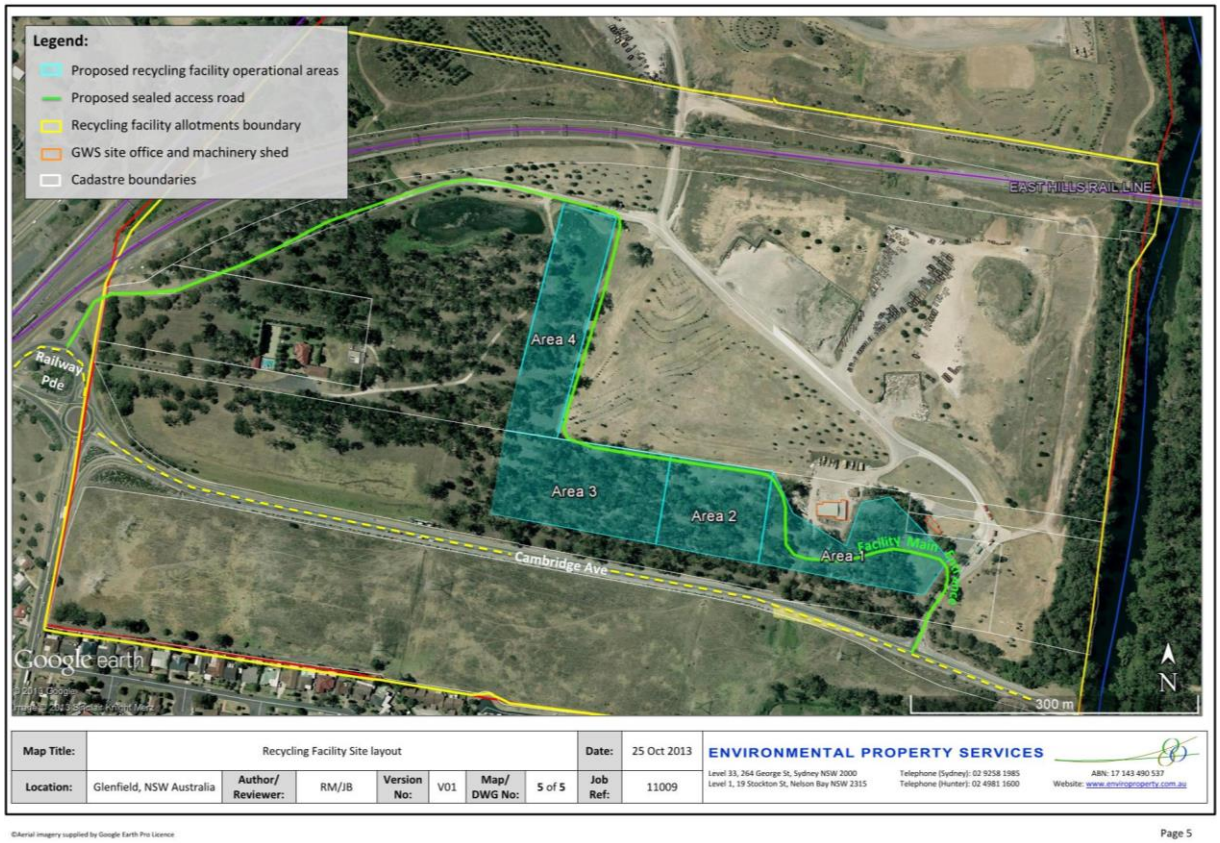
2.2 Short-term to Medium-term Land Use Activities

The GWS northern parcel of land will continue in the short term, to operate as landfill. As part of the owner's broader strategy to promote sustainable practices while improving the viability of the operation, GWS proposes to increase the Site's recycling operations in the southern parcel of land (refer **Figure 3**).

Subject to planning approval the expanded recycling operation will recycle a number of waste streams with the bulk of the waste being construction and demolition (C&D) waste. The C&D waste will consist of timber, green waste, concrete, brick and asphalt. Recycling will also include virgin excavated natural material (VENM) and excavated natural material (ENM).

The proposed short-term to medium-term land use activities, as described above, are subject of a development application currently being prepared by EPS.

Figure 3 Short-term to Medium-term Land Use Activity



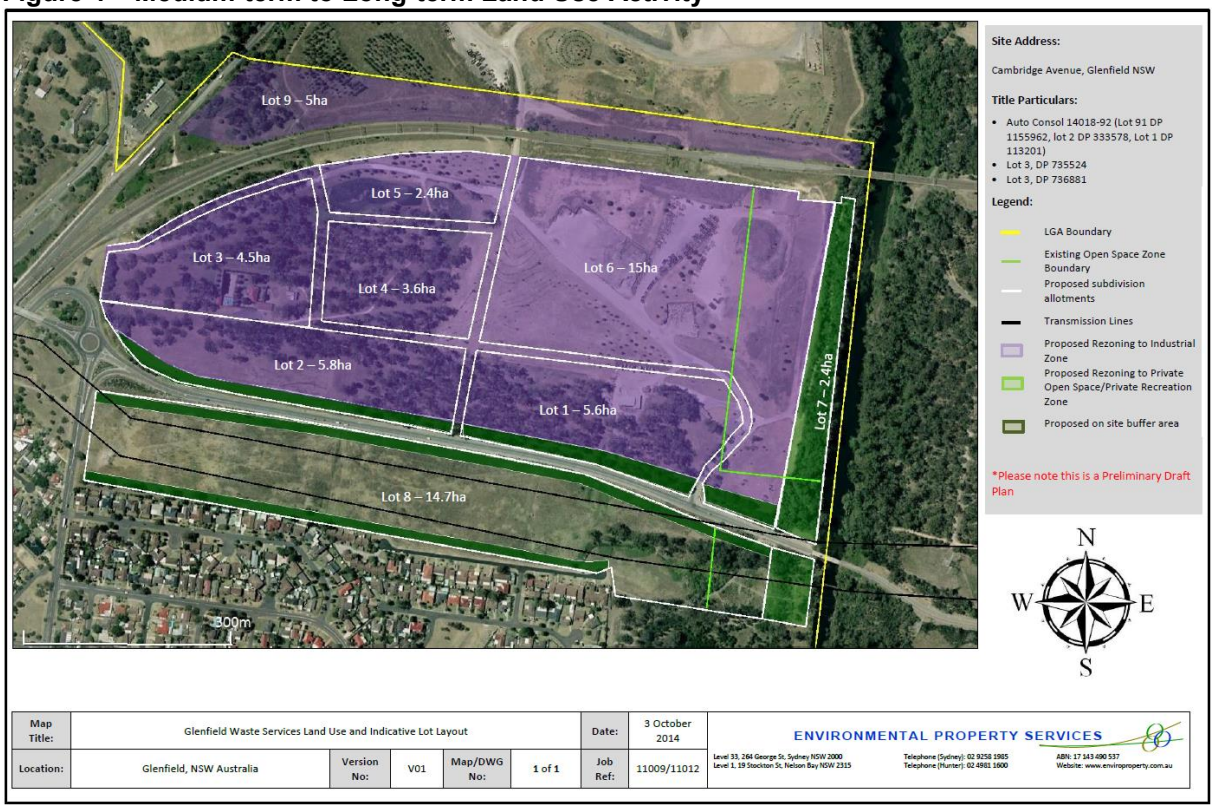
2.3 Medium-term to Long-term Land Use Activities

To facilitate industrial development on the site, amendments to the existing operation will be planned and implemented. A closure plan for the Site will be undertaken in accordance with the Protection of the Environment Operations Act 1997 (POEO Act) and the relevant Environment Protection Licence (EPL) conditions.

The closure plan describes the steps necessary to close the landfill in accordance with the statutory closure requirements and details the post-closure care activities that include monitoring and maintaining the waste containment systems and monitoring groundwater to ensure that waste is not escaping and polluting the surrounding environment.

Subject to planning approval the Site would then be developed for industrial uses with a focus on warehousing and logistics. An indicative lot layout of the medium-term to long-term land use activities is provided in **Figure 4**.

Figure 4 Medium-term to Long-term Land Use Activity



2.4 Nearest Noise Sensitive Receivers

The nearest noise sensitive residential receivers to the Site are located in the Glenfield residential area to the south of Cambridge Avenue and to the west of the Site in the Glenfield Road residential development. The location of the sensitive receivers along with background noise monitoring locations are illustrated in **Figure 5**

Figure 5 Nearest Sensitive Receivers

3 EXISTING ACOUSTICAL ENVIRONMENT

3.1 Methodology

A site inspection was conducted on Thursday 1 May 2014 to gain an appreciation of the subject site and to commence the noise monitoring program. Both short-term operator-attended and long-term unattended noise monitoring surveys were conducted. Two (2) environmental noise loggers were positioned at locations representing the nearest sensitive receivers to the site as shown in **Figure 5**. Details of the loggers and their locations are provided in **Table 1**.

Table 1 Noise Monitoring Details

Location Reference	Location	Noise Logger Type / Serial No.	Monitoring Period
NM1	8 Goodenough Street, Glenfield	ARL Type EL316 / 16-207-042	Thursday 1 May 2014 to Wednesday 14 May 2014, inclusive
NM2	3 Albion Crescent, Glenfield	ARL Ngara / 878049	Friday 16 May 2014 to Friday 23 May 2014 inclusive

Operator-attended noise surveys were conducted during logger deployment for a period of 15 minutes at the logger locations.

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1-2004 *Electroacoustics - Sound level meters - Specifications* and carries current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

3.2 Unattended Noise Monitoring

Each noise logger was set to record statistical indices over 15-minute intervals including L_{Amax}, L_{A1}, L_{A10}, L_{A90} and L_{Aeq} noise levels.

Weather data for the survey period was obtained from the nearest Bureau of Meteorology (BoM) weather station located at Bankstown Airport, approximately 9 km north-east of the monitoring location. Unattended noise data corresponding with periods of rainfall and/or wind speeds in excess of 5 m/s (approximately 18km/h) were discarded in accordance with INP data exclusion methodology.

Results of the unattended noise monitoring program are provided in graphical format in **Appendix A**. A summary of noise levels measured during the unattended noise monitoring program is provided in **Table 2**.

Table 2 Summary of Existing Ambient Noise Levels – Glenfield

Location	Period	Background L_{A90} Noise Level Rating Background Level	Measured $L_{Aeq(Period)}$	Estimated Existing Industrial Contribution L_{Aeq}
NM1 8 Goodenough Street, Glenfield	Day	42 dBA	51 dBA	37 dBA (GWS)
	Evening	42 dBA	49 dBA	< 39 dBA
	Night	36 dBA	48 dBA	< 34 dBA
NM2 3 Albion Crescent Glenfield	Day	39 dBA	52 dBA	< 49 dBA
	Evening	45 dBA	51 dBA	< 39 dBA
	Night	35 dBA	48 dBA	< 34 dBA

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am
On Sundays and Public Holidays, Daytime 8.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 8.00 am
The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level
L_{Aeq} - The equivalent continuous noise level is defined as the level of noise equivalent to the energy average of noise levels occurring over a measurement period
All noise levels reported here are free-field measurements, meaning that no noise reflections occurred from building façades at the noise monitoring location.

3.3 Operator-Attended Noise Monitoring

The purpose of the operator-attended noise survey was to determine the character and duration of various noise sources to the total ambient noise level. The results of the operator-attended noise survey are provided in **Table 3**.

Table 3 Operator-attended Noise Survey Results – Glenfield

Location	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 μPa)					Description of Noise Emission, Typical Maximum Levels, L_{Amax} (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A90}	
NM1 8 Goodenough Street, Glenfield	1/05/2014 12:10 pm Wind: 0.5 E Temp: 20°C	65	58	50	47	40	Plane 50 to 62 Resident 48 to 53 Traffic 40 to 46 Local traffic 51 to 65 Birds 47 to 52 Train horn 41 GWS site 32 to 62 GWS contribution $L_{Aeq(15minute)}$ - 37
NM2 3 Albion Crescent, Glenfield	1/05/2014 12:49 pm Wind: 0.5 E Temp: 20°C	57	52	46	43	38	Plane 42 to 51 Train 47 to 50 Train horn 49 to 56 Insects 41 Dog 54 GWS site not audible

Operator-attended noise survey results indicate that the main contributors to the ambient noise environment in the vicinity of the GWS site are road and rail traffic at both noise monitoring locations with current operations at the GWS site also contributing at Goodenough Street.

4 NOISE IMPACT ASSESSMENT PROCEDURES

4.1 NSW Industrial Noise Policy

Responsibility for the control of noise emission in New South Wales (NSW) is vested in Local Government and the Environment Protection Authority (EPA). The INP was released in January 2000 and provides a framework and process for deriving noise criteria for consents and licences that will enable the relevant authority to regulate premises that are scheduled under the Protection of the Environment Operations Act, 1997.

The specific policy objectives are:

- To establish noise criteria that would protect the community from excessive intrusive noise and preserve amenity for specific land uses.
- To use the criteria as the basis for deriving project specific noise levels.
- To promote uniform methods to estimate and measure noise impacts, including a procedure for evaluating meteorological effects.
- To outline a range of mitigation measures that could be used to minimise noise impacts.
- To provide a formal process to guide the determination of feasible and reasonable noise limits for consents or licences that reconcile noise impacts with the economic, social and environmental considerations of industrial development.
- To carry out functions relating to the prevention, minimisation and control of noise from premises scheduled under the Act.

The policy sets two separate noise criteria to meet environmental noise objectives; one to account for intrusive noise and the other to protect the amenity of particular land uses.

Assessing Intrusiveness

For assessing intrusiveness, the background noise level must be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than five decibels above the measured background level (L_{A90}).

Assessing Amenity

The amenity assessment is based on noise criteria specific to land use and associated activities (**Table 4**). The criteria relate only to industrial-type noise and do not include road, rail or community noise. The existing noise level from industry is measured. If it approaches the criterion value, then noise levels from new industries need to be designed so that the cumulative effect does not produce noise levels that would significantly exceed the criterion (**Table 5**).

Table 4 Amenity Criteria Recommended L_{Aeq} Noise Levels from Industrial Noise Sources

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended $L_{Aeq(Period)}$ Noise Level (dBA)	
			Acceptable	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45
	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
	Urban	Day	60	65
		Evening	50	55
		Night	45	50
	Urban/Industrial Interface (for existing situations only)	Day	65	70
		Evening	55	60
		Night	50	55
School classrooms - internal	All	Noisiest 1 hour period when in use	35	40
Hospital wards - internal - external	All	Noisiest 1 hour period	35 50	40 55
Place of worship - internal	All	When in use	40	45
Area specifically reserved for passive recreation (eg National Park)	All	When in use	50	55
Active recreation area (eg school playground, golf course)	All	When in use	55	60
Commercial premises	All	When in use	65	70
Industrial premises	All	When in use	70	75

Note: Monday - Saturday: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am. Sundays, Public Holidays: Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am. The L_{Aeq} index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Table 5 Modification to Acceptable Noise Level (ANL)* to Account for Existing Levels of Industrial Noise

Total Existing L_{Aeq} Noise Level from Industrial Noise Sources	Maximum L_{Aeq} Noise Level for Noise from New Sources Alone, dBA
≥ Acceptable noise level plus 2 dBA	If existing noise level is *likely to decrease* in future acceptable noise level minus 10 dBA If existing noise level is *unlikely to decrease* in future existing noise level minus 10 dBA
Acceptable noise level plus 1 dBA	Acceptable noise level minus 8 dBA
Acceptable noise level	Acceptable noise level minus 8 dBA
Acceptable noise level minus 1 dBA	Acceptable noise level minus 6 dBA
Acceptable noise level minus 2 dBA	Acceptable noise level minus 4 dBA
Acceptable noise level minus 3 dBA	Acceptable noise level minus 3 dBA
Acceptable noise level minus 4 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 5 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 6 dBA	Acceptable noise level minus 1 dBA
< Acceptable noise level minus 6 dBA	Acceptable noise level

* ANL = recommended acceptable L_{Aeq} noise level for the specific receiver, area and time of day from **Table 4**

Section 2.2.4 of the NSW INP provides a coarse methodology for the determination of relevant noise criteria for a proposed industrial area, such as the subject site, and states the following:

> *Where several developments are proposed for an area, these are to be assessed as a group. This holistic approach allows project-specific noise levels to be set for a proposed industrial development, so that the total impact from all proposed and potential industrial developments does not cause* (acoustic) *amenity to deteriorate.*

Application Notes prepared by the EPA (and approved in December 2010) to accompany the INP state the following:

> *The intrusive and amenity criteria outlined in Section 2 of the INP were established primarily to deal with individual development applications for industrial sites in the vicinity of existing sensitive receivers with stable background noise levels. In Section 2.2.4 the INP recognises that for multiple developments, such as a new industrial area, a strategic approach can be implemented to ensure the amenity objectives are not compromised and an equitable share of the remaining available allocation of amenity-related noise for each industrial development is achieved.*

For the purpose of this noise assessment the amenity noise criteria has been adopted to assess potential noise impacts for the proposed medium to long-term land use where multiple developments are proposed. The intrusive and sleep disturbance impacts of proposed developments for the medium to long-term land use would need to be assessed when more information is known about the developments that will occupy the site.

5 OPERATIONAL NOISE CRITERIA

Residences surrounding the development have been classified for the purposes of this noise assessment as ‘suburban’. The ‘suburban’ classification is not determined in relation to the planning zone of these residences but is an acoustical classification. The ambient noise at these locations is influenced by road traffic noise and (to a lesser extent) noise from existing industrial facilities.

The operational amenity noise criteria contained in **Table 6** have been determined based on measured noise levels (provided in **Table 2**) and with reference to the INP.

Table 6 Project Specific Noise Criteria

Location	Indicative Noise Amenity Area	Period	Amenity Criteria $L_{Aeq(Period)}$
Nearest residences	Suburban	Day	55
		Evening	45
		Night	40

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am
On Sundays and Public Holidays, Daytime 8.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 8.00 am.

6 EFFECTS OF METEOROLOGY ON NOISE LEVELS

6.1 Wind

Wind has the potential to increase noise levels at a receiver when it is light and stable and blows from the direction of the source of the noise. As the strength of the wind increases the noise produced by the wind will obscure noise from most industrial and transport sources.

Wind effects need to be considered when wind is a feature of the area under consideration. Where wind blows from the source to the receiver at speeds up to 3 m/s for more than 30% of the time in any season, then wind is considered to be a feature of the area and noise level predictions must be made under these conditions.

Weather data was obtained, for a period of 12 months (April 2013 to April 2014), from the BoM weather station located at Bankstown Airport, approximately 9 km north-east of the subject site. This data was analysed to determine the frequency of occurrence of winds up to speeds of 3 m/s for day, evening and night in each season.

A summary of the most frequently occurring winds for each period is contained within **Table 7**, **Table 8** and **Table 9**.

Table 7 Seasonal Frequency of Occurrence of Wind Speed Intervals - Daytime

Period	Calm	Wind Direction	0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	2.2%	NNW±45^o	3.7%	3.9%	7.6%
Autumn	5.3%	WNW±45^o	11.2%	5.5%	16.7%
Winter	5.3%	WNW±45^o	12.0%	6.6%	18.5%
Spring	1.9%	WNW±45^o	6.2%	5.5%	11.7%

Table 8 Seasonal Frequency of Occurrence of Wind Speed Intervals - Evening

Period	Calm	Wind Direction	0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	1.5%	NE±45^o	5.8%	4.9%	10.7%
Autumn	20.3%	NNE±45^o	10.1%	3.8%	13.9%
Winter	30.0%	W±45^o	10.5%	5.0%	15.5%
Spring	8.3%	NE±45^o	8.9%	4.1%	13.0%

Table 9 Seasonal Frequency of Occurrence of Wind Speed Intervals - Night

Period	Calm	Wind Direction	0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	30.4%	NE±45^{o}	11.3%	4.0%	15.2%
Autumn	39.8%	WSW±45^{o}	16.7%	5.3%	22.1%
Winter	34.4%	WNW±45^{o}	16.5%	4.2%	20.7%
Spring	39.3%	SW±45^{o}	10.4%	4.6%	15.0%

Seasonal wind records indicate that prevailing winds are not a feature of the area since the frequency of occurrence of winds up to 3 m/s is below the 30% threshold for all seasons. Hence, prevailing winds have not been considered as part of this noise assessment.

6.2 Temperature Inversions

Temperature inversions, when they occur, have the ability to increase noise levels by focusing sound waves. Temperature inversions generally occur during the night-time and early morning periods during the winter months. For a temperature inversion to be a significant characteristic of the area it needs to occur for approximately 30% of the total night-time during winter, or about two nights per week.

Meteorological data regarding the occurrence of temperature inversions was not available for the area. Therefore, it has been assumed that temperature inversions are a feature of the area and have been considered during the night-time period. The default INP value of 3^{o}C/100 m has been adopted for this assessment.

7 NOISE MODELLING

7.1 Noise Modelling Methodology and Assumptions

A computer model was used to predict noise emissions from the proposed development. Noise modelling was undertaken using SoundPLAN v7.3 software, developed by Braunstein and Berndt Gmbh in Germany. A three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process. The model used this map, together with noise source data, ground cover and atmospheric information to predict noise levels at the nearest potentially affected receivers.

Topographic contours and drawings of the proposed site were supplied by EPS and utilised for the purpose of modelling noise from the proposed development.

SLR has examined numerous industrial developments and developed a range of representative sound power levels for different scales of industrial operations. The proposed land use strategy is for typically “low noise” industrial use with a focus on warehousing and logistics. Notwithstanding this to provide a conservative assessment approach a number of “medium noise” premises have also been considered at the site. A description of the development type and the representative sound power level (SWL) used in the computer noise model for each site are provided in **Table 10**.

Table 10 Representative Noise Sources

Noise Source	Description	Sound Power Level
"Low noise" industrial premise (24 premises)	E.g. warehousing, logistics, industrial / commercial retailer, restaurant / take-away store.	105 dBA per premise
"Medium noise" industrial premise (2 premises)	E.g. building supplies manufacturer, automotive manufacturer, metal fabrication, livestock processing industries.	116 dBA per premise

The following assumptions have been made for the purpose of modelling noise from the subject site:

- The existing earth bund and fence located immediately north of Cambridge Avenue will remain in place. No other specific noise mitigation measures have been included.
- No hypothetical future buildings or structures have been incorporated across the site.
- The proposed industrial sites are distributed evenly across the subject site. The areas south of Cambridge Avenue and north of the East Hills Railway line have been assumed to be open space and not occupied by industrial uses.
- Modelled noise sources have been assumed not to contain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low frequency content. Based on previous experience, these modifying factors do not typically apply to most sources that operate within low and medium noise generating industrial developments.
- During the daytime period the site is 100% utilised, during the evening period the site is 40% utilised and during the night-time the site is 5% utilised.

Prediction of noise under calm and prevailing atmospheric conditions (temperature inversion) was conducted. Meteorological parameters provided in **Table 11** were utilised in the noise model.

Table 11 Meteorological Conditions for Noise Predictions

Scenario	Temperature	Humidity	Wind Speed	Wind Direction	Temperature Gradient
Calm (day/evening)	20^{o}C	65%	n/a	n/a	n/a
Temperature Inversion (night only)	10^{o}C	90%	n/a	n/a	3^{o}C/100m

The potential for the simultaneous operation of proposed developments can be assessed on a worst case scenario basis by adding the predicted noise levels from the proposed operations together. The cumulative level is then adjusted (by -3 dBA) to the equivalent amenity level for comparison with the relevant amenity criteria for each location. It should be noted that, for each of the developments assessed, the likelihood of the proposed future developments emitting simultaneous maximum noise emissions is remote due to the range of development locations and differences in the noise enhancing weather effects. This cumulative assessment is therefore considered to be conservative.

7.2 Noise Modelling Results and Discussion

Predicted $L_{Aeq(period)}$ noise levels at neighbouring noise-sensitive locations representative of potential noise levels likely to be experienced once developments are in use at the GWS site are provided in **Table 12**.

Table 12 Predicted $L_{Aeq\ (period)}$ Noise Emission Levels and Relevant Goals (dBA)

Receiver	Period	Calm	Temperature Inversion	Amenity Criteria
Slessor Road, Casula	Day	44	-	55
	Evening	40	-	45
	Night	31	35	40
Glory Road (north), Glenfield	Day	49	-	55
	Evening	45	-	45
	Night	36	39	40
Glory Road (south), Glenfield	Day	47	-	55
	Evening	43	-	45
	Night	34	38	40
Minstrel Street, Glenfield	Day	47	-	55
	Evening	43	-	45
	Night	34	37	40
Canterbury Road, Glenfield	Day	47	-	55
	Evening	43	-	45
	Night	34	38	40
Fergusson Street (west), Glenfield	Day	46	-	55
	Evening	42	-	45
	Night	33	37	40
Fergusson Street (central), Glenfield	Day	48	-	55
	Evening	43	-	45
	Night	34	37	40
Fergusson Street (east), Glenfield	Day	49	-	55
	Evening	45	-	45
	Night	36	40	40
Goodenough Street (west), Glenfield	Day	49	-	55
	Evening	45	-	45
	Night	36	40	40
Goodenough Street (central), Glenfield	Day	48	-	55
	Evening	44	-	45
	Night	35	39	40
Goodenough Street (east), Glenfield	Day	49	-	55
	Evening	45	-	45
	Night	35	39	40

Predicted noise emission levels (shown in **Table 12**) for a hypothetical industrial estate are predicted to comply with the relevant noise goals during day, evening and night-time periods at all existing residential locations considered under calm and prevailing weather conditions.

It should be noted that the predicted noise levels are conservative; it is possible that considerable screening of acoustically significantly activities would be provided by buildings once the site is developed. Furthermore, no specific noise mitigation measures, besides the existing mound and fence, have been included in the noise model. It is possible that actual noise levels would be less than those stated here.

Predicted noise levels could be greatly reduced from judicious planning with potentially noisier developments located further from residential receptors as well as the use of equipment incorporating 'quiet' engineering design, the addition of acoustically designed enclosures, noise barriers or using management techniques. Further discussion in this regard is provided in the following section.

8 NOISE MITIGATION AND MANAGEMENT

The aim of the following discussion regarding noise mitigation and management recommendations is to demonstrate that it will be possible to operate the GWS site as an industrial estate whilst achieving relevant noise objectives. It is likely that a combination of the recommended techniques would be effective at enabling noise emission levels to remain below the relevant noise amenity goals at the subject site.

8.1 Industrial Estate Noise Management

In order to ensure that future potential industrial developments do not cause the amenity level to deteriorate and to minimise 'background creep' the project specific noise level for each individual site should be set so that the total impact from all proposed and potential industrial developments do not exceed the INP Acceptable amenity noise level at the nearest residential receiver. The adoption of this approach also provides an equitable distribution of the burden of meeting the noise criteria between all future potential industrial developments at the site.

The preliminary site layout indicates the potential for six (6) lots where future industrial sites would be developed. The proposed project specific amenity noise criteria for each proposed lot at any potentially affected residential receptor is provided in **Table 13**.

Table 13 Project Specific Noise Criteria

Industrial Noise Source	Amenity Criteria $L_{Aeq(period)}$		
	Day	Evening	Night
Lot 1	47 dBA	37 dBA	32 dBA
Lot 2	47 dBA	37 dBA	32 dBA
Lot 3	47 dBA	37 dBA	32 dBA
Lot 4	47 dBA	37 dBA	32 dBA
Lot 5	47 dBA	37 dBA	32 dBA
Lot 6	47 dBA	37 dBA	32 dBA
Total GWS Site	55 dBA	45 dBA	40 dBA

Where multiple industrial premises are proposed for each lot (as has been assumed in **Section 7**) project specific noise criteria should be set on an individual basis to ensure noise from each lot does not exceed the levels provided in **Table 13**. It should be stressed that the project specific noise criteria detailed in **Table 13** is highly dependent on the number of proposed lots and as such should be considered as indicative only at this preliminary stage.

8.2 Site Specific Noise Mitigation and Management

Selecting an appropriate strategy for the proposed development involves the following steps:

- Determining the noise reduction required to achieve the project-specific noise levels.
- Identifying the specific characteristics of the industry and the site that would indicate a preference for specified measures.

- Examining the mitigation strategy chosen by similar industries on similar sites with similar requirements for noise reduction; and considering that strategy's appropriateness for the subject development.
- Considering the range of noise-control measures available.
- Considering community preferences for particular strategies. This is especially important when the community has particular sensitivities to noise.

It is envisaged that these steps would be considered in greater detail during the development application stage for individual sites within the GWS site when more knowledge is available with regard to the specific types of industry proposed.

The intrusive and sleep disturbance impacts of proposed developments would need to be addressed during the development application process. Furthermore, consideration would also need to be given to the presence of sources that should attract modifying factor corrections as described in the INP.

Essentially, there are three (3) main mitigation strategies for noise control:

1 Controlling noise at the source.
There are two approaches:

- Best Management Practice (BMP): the adoption of particular operational procedures that minimise noise while retaining productive efficiency.
- Best Available Technology Economically Achievable (BATEA): equipment, plant and machinery that produce noise incorporate the most advanced and affordable technology to minimise noise output.

2 Controlling the transmission of noise.
There are two approaches: the use of barriers and land-use controls, which attenuate noise by increasing the distance between source and receiver.

3 Controlling noise at the receiver.
There are two approaches:

- Negotiating an agreement with the landholder.
- Acoustic treatment of dwellings to control noise.

It is envisaged that a combination of the first two mitigation strategies (controlling noise at the source and controlling transmission of noise) will be best suited to industrial activities within the GWS site.

Section 7.7 of the INP describes generic noise control measures applicable to industrial sites. These are contained in **Table 14** together with practical suggestions regarding how these could be applied to effectively minimise noise impacts from the GWS site.

Table 14 Generic Noise Control Measures – Recommendations applicable to GWS

Generic Noise Mitigation Measures (INP Section 7.7)	Applicability to GWS site
Noise source controls	
Enclosing the source – the design of the enclosure and materials used to absorb sound will affect the attenuation achieved.	Operate equipment within buildings or other enclosures. A noise level reduction of approximately 10 dBA is typically assumed for enclosing a noise source.
Silencing exhausts – muffler design and noise barrier systems.	Adjust reversing alarms on heavy equipment to make them 'smarter', by limiting acoustic range to the immediate danger area. Use equipment with efficient muffler design. Use quieter engines, such as electric instead of internal combustion. Dampen or line metal trays or bins.
Times of operation.	Restrict night-time movement of vehicles on-site where practical. Schedule the use of noisy equipment at the least sensitive time of day. This may involve consultation with the nearest noise-sensitive receivers. Where there are several noisy pieces of equipment, schedule operations so they are used separately rather than concurrently.
Controls along the sound transmission path	
Noise barriers – more effective if near source or receiver; effectiveness also controlled by materials used (reflective or absorptive) and by height.	Noise barriers localised to individual proposed lots in GWS site or in the southern 'open space' area.
Mounds, bunds and trenches.	Barriers can take a number of forms including free-standing walls, grass or earth mounds or bunds, and trenches or cuttings within which noise sources are sited. They could be located on the boundary of the GWS site or on individual industrial sites.
Site design to maximise the distance from the critical noise source to the receiver, and with intervening buildings to act as barriers.	Siting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area Orienting noisy equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise. Employing 'quiet' practices when operating equipment -for example, positioning idling trucks in appropriate areas. For industrial buildings near the boundary limit the number of openings (doors, windows, etc) that face toward noise-sensitive receivers.

9 CONCLUSION

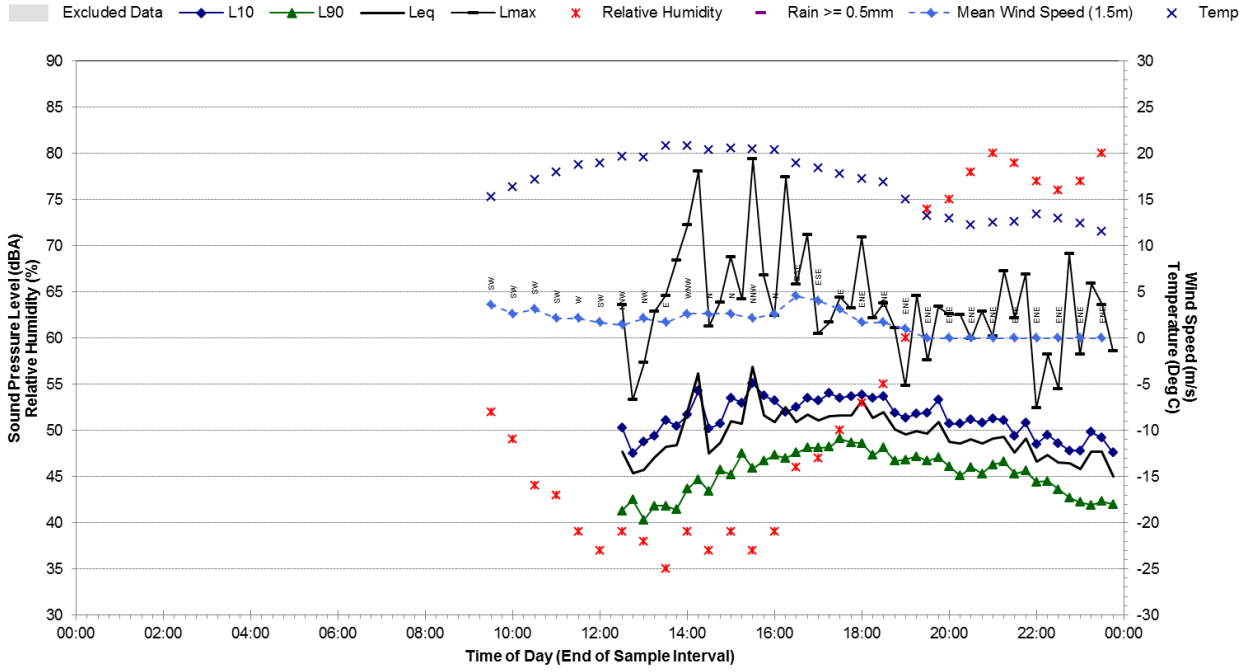
SLR has undertaken a noise assessment relating to the proposed rezoning of the southern parcel of Glenfield Waste Site (GWS) located at Cambridge Avenue, Glenfield.

Noise emission predictions were conducted based on the proposed land usage with a focus on “low noise” premises such as warehousing and logistics, however to provide a conservative assessment approach a number of “medium noise” premises have also been considered at the site. Noise modelling results indicate that relevant noise amenity criteria could be achieved at all surrounding existing residences. Recommendations have also been provided with regard to generic noise mitigation measures that could be implemented at the subject site.

It has been demonstrated that it will be possible to operate the GWS site as an industrial estate whilst achieving relevant noise objectives.

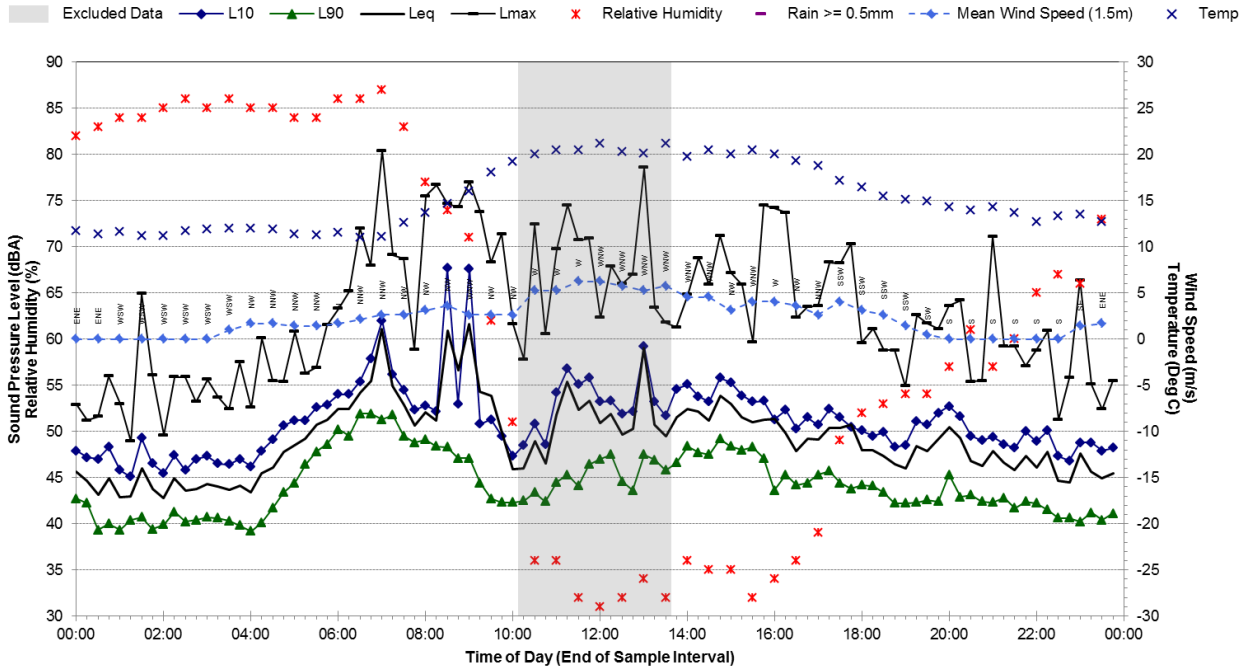
Statistical Ambient Noise Levels

8 Goodenough Street, Glenfield - Thursday, 1 May 2014



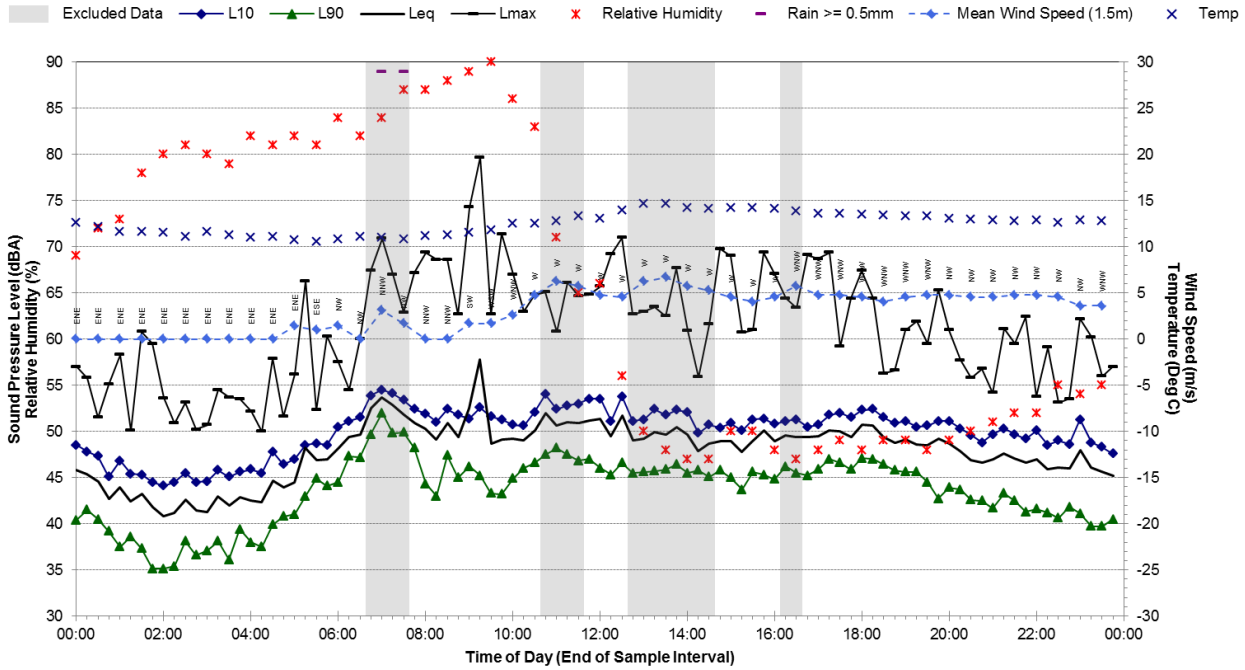
Statistical Ambient Noise Levels

8 Goodenough Street, Glenfield - Friday, 2 May 2014



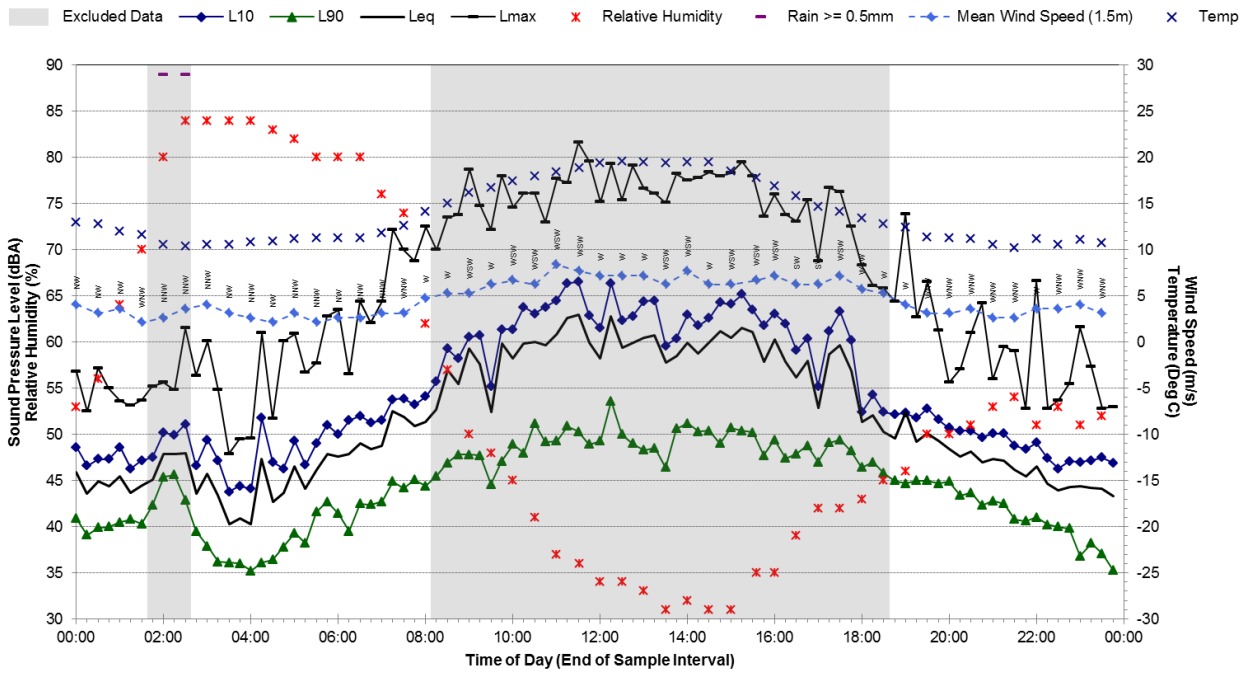
Statistical Ambient Noise Levels

8 Goodenough Street, Glenfield - Saturday, 3 May 2014



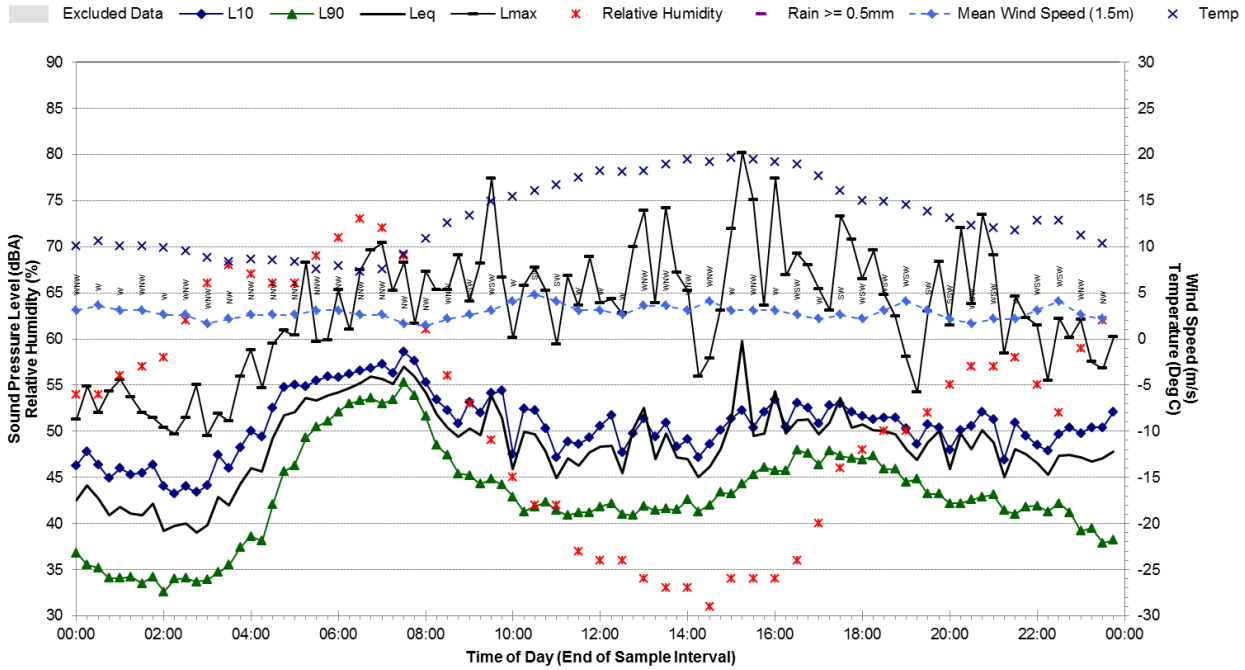
Statistical Ambient Noise Levels

8 Goodenough Street, Glenfield - Sunday, 4 May 2014



Statistical Ambient Noise Levels

8 Goodenough Street, Glenfield - Monday, 5 May 2014



Statistical Ambient Noise Levels

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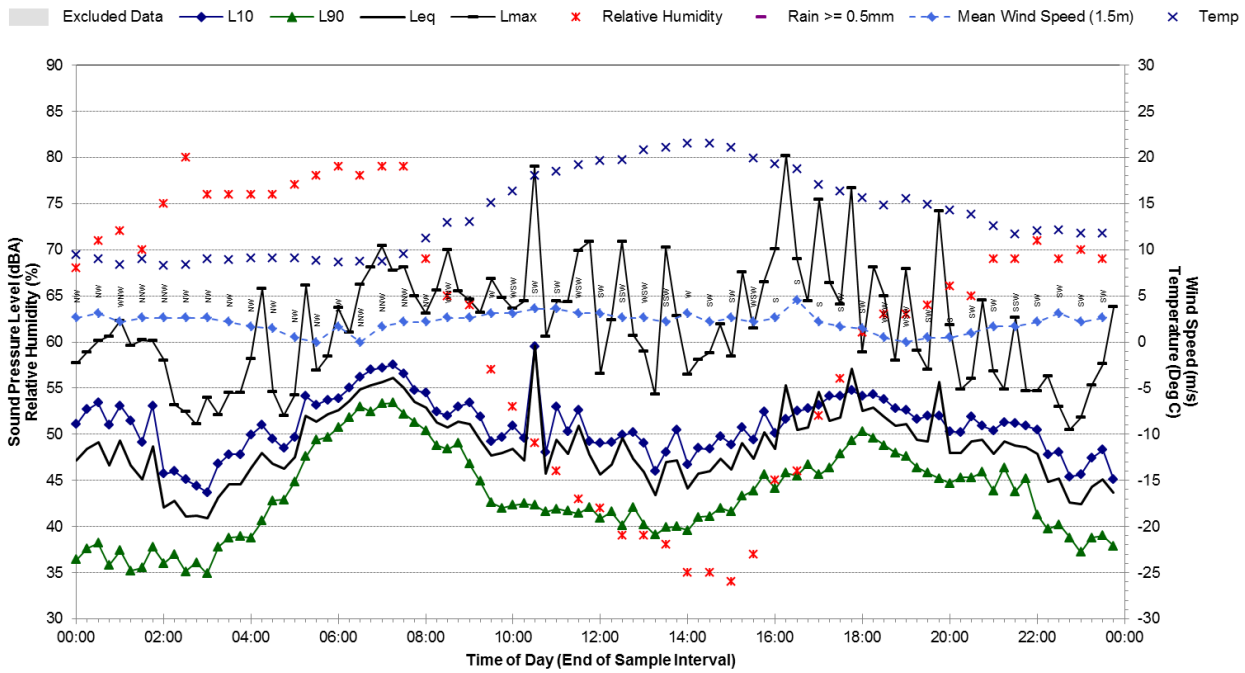

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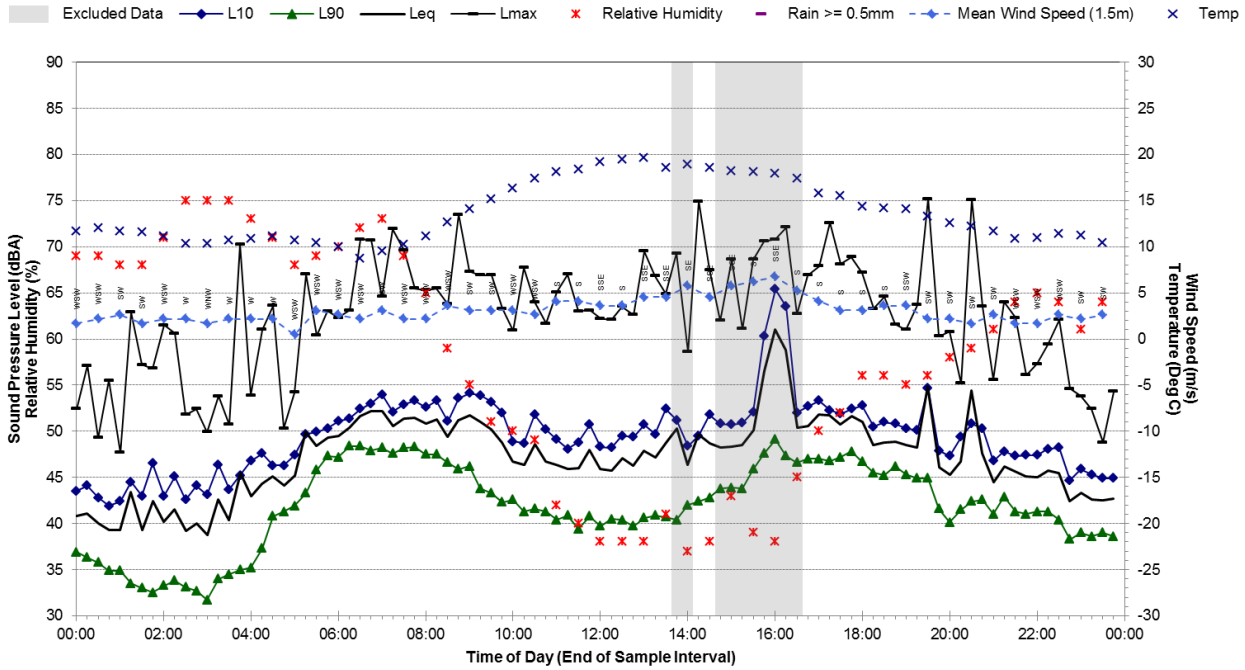

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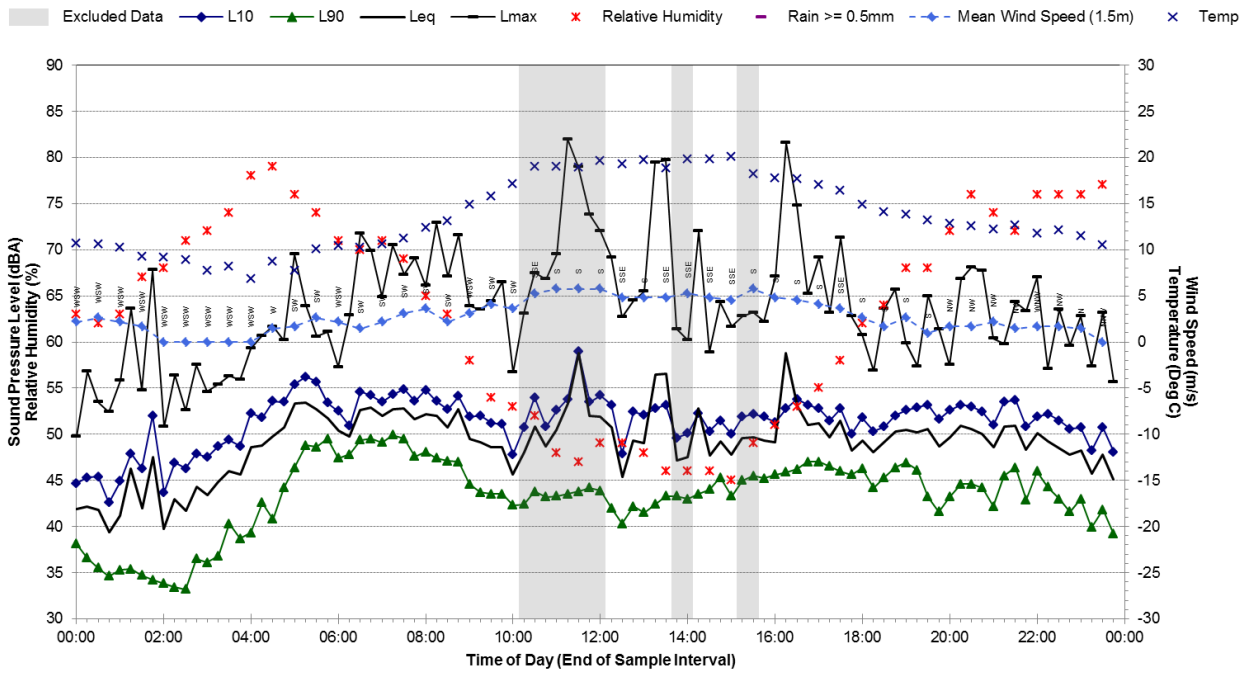

Statistical Ambient Noise Levels

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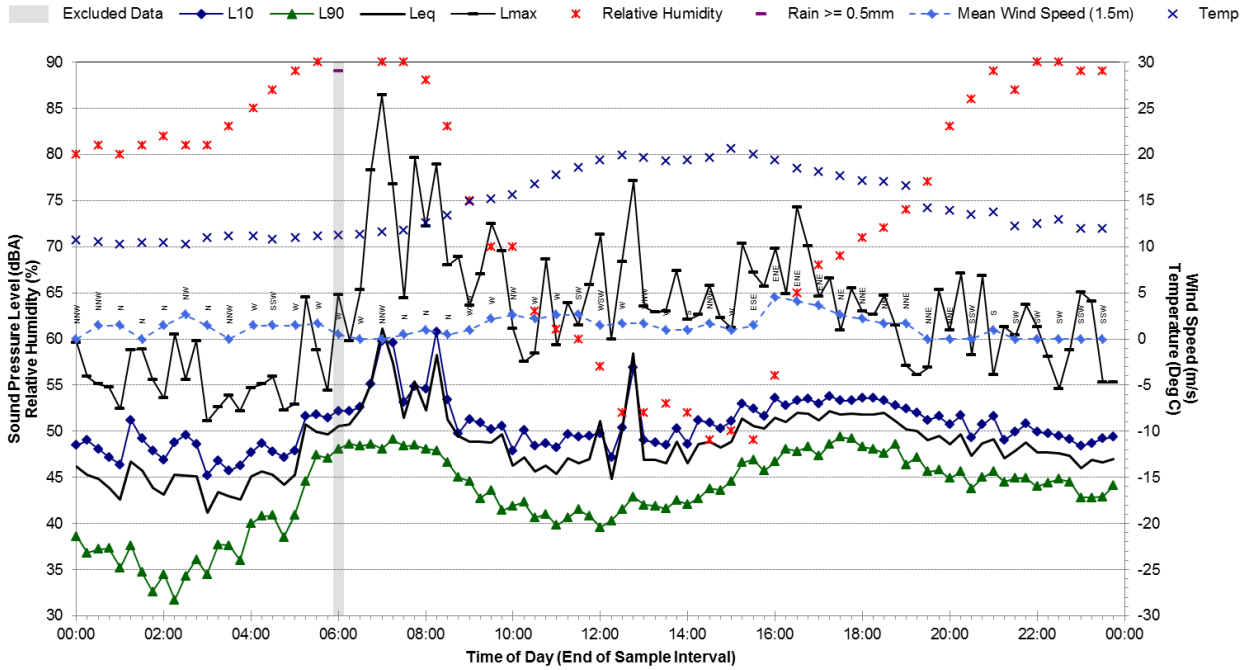

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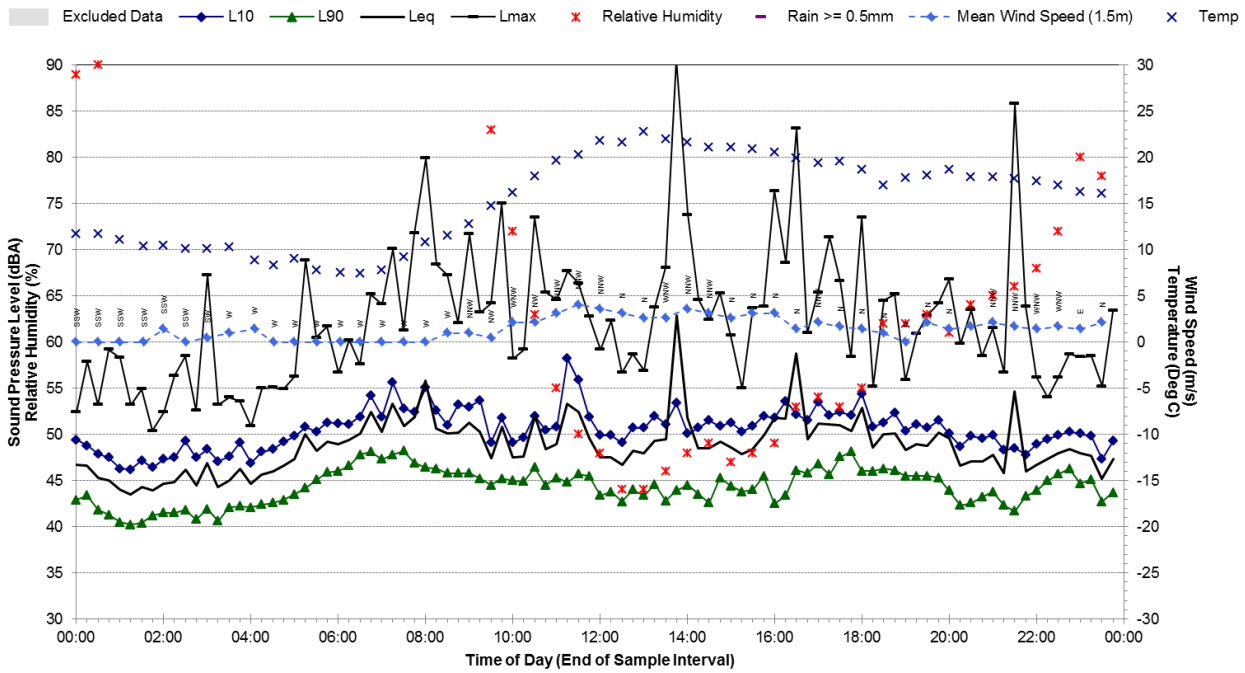

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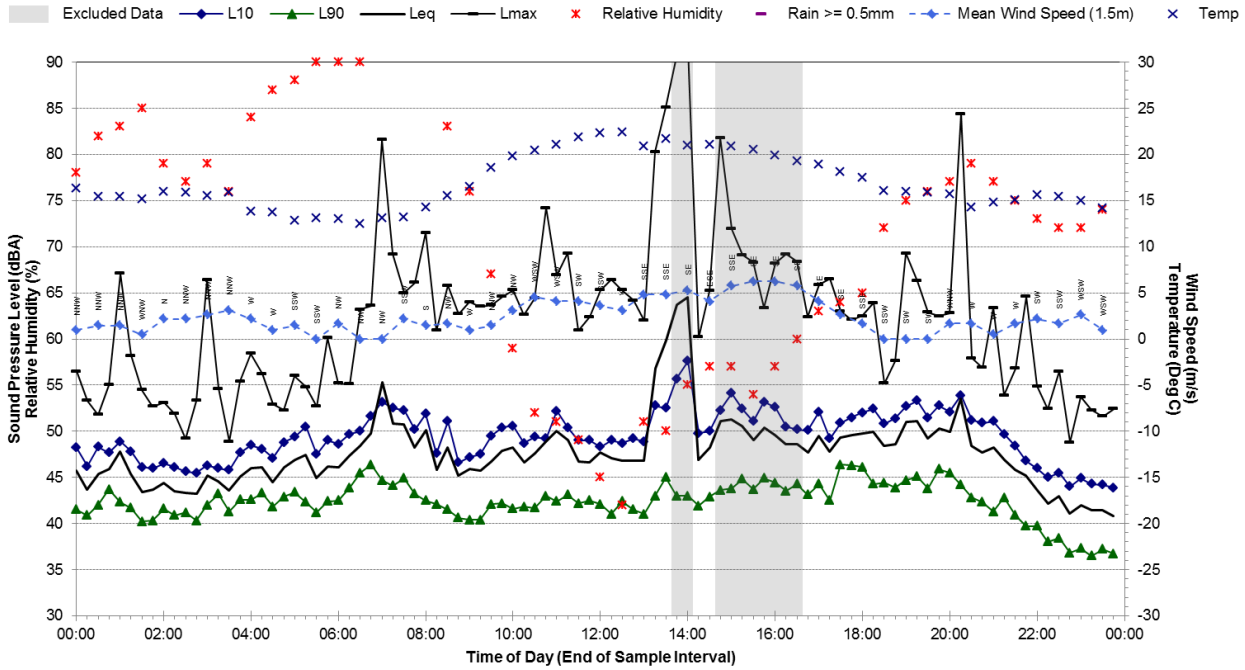

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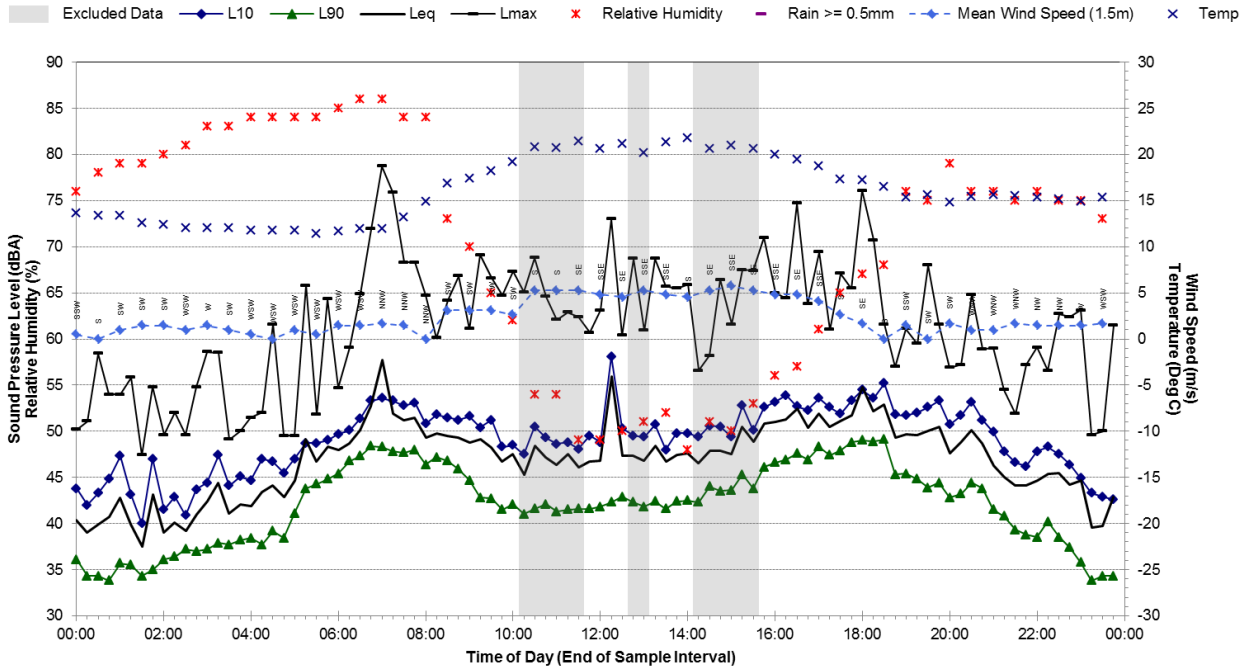

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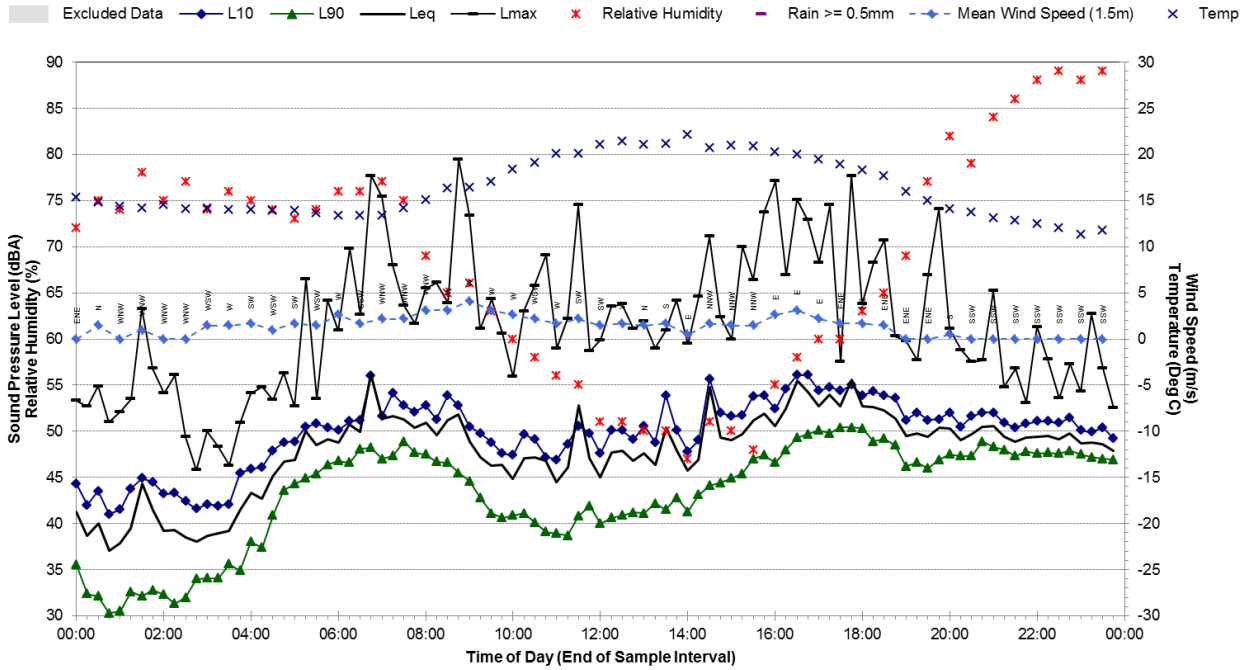

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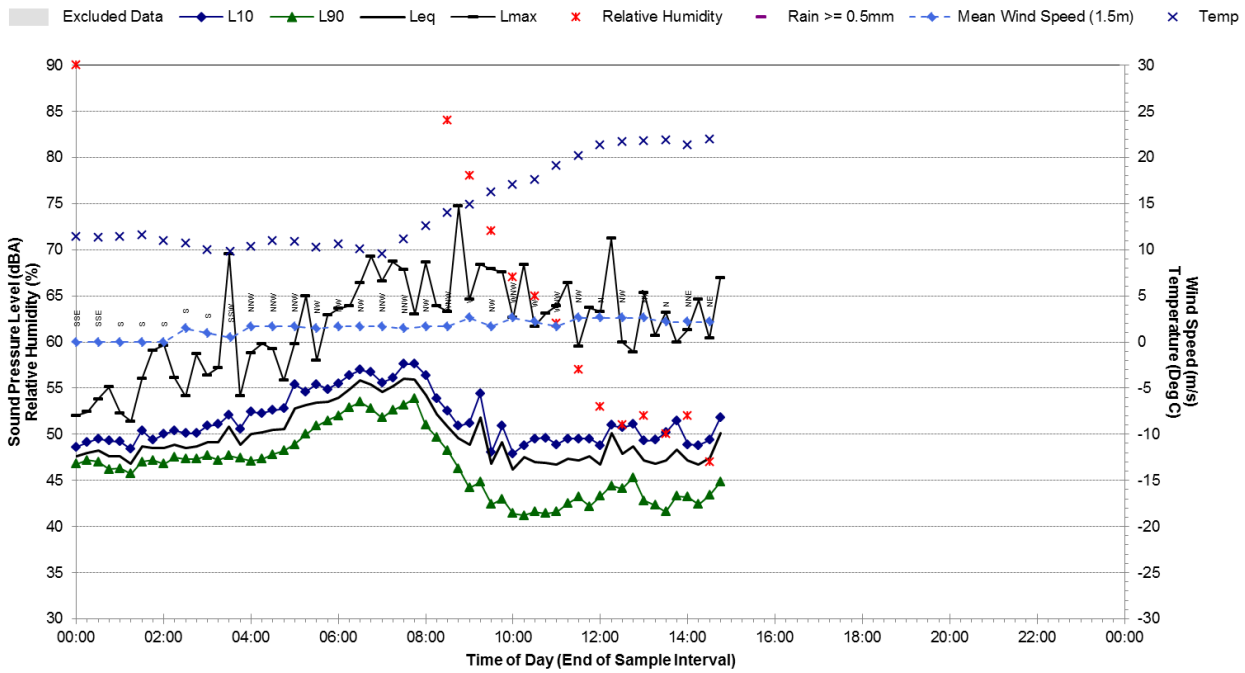

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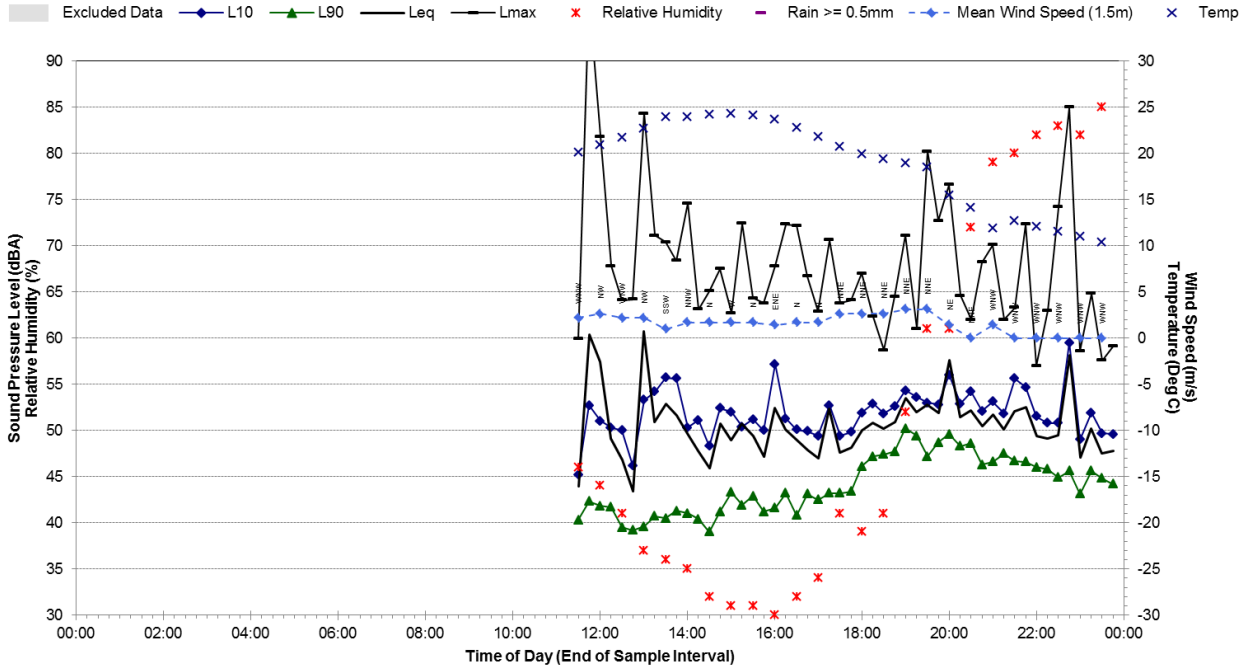

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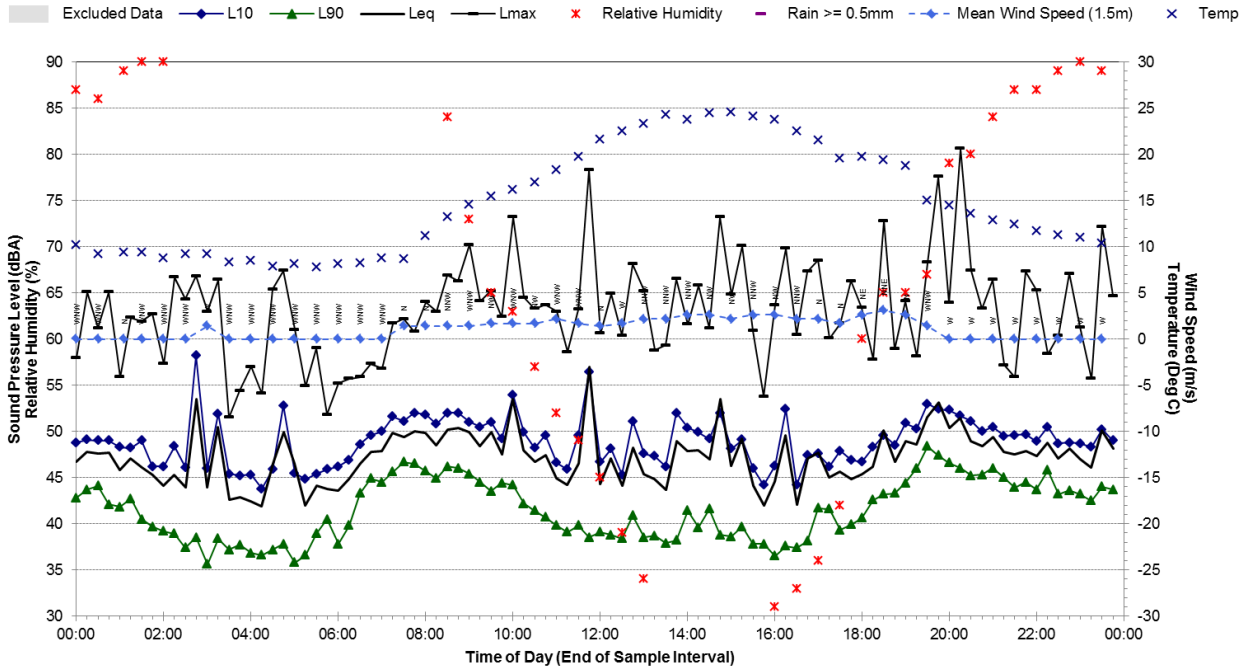

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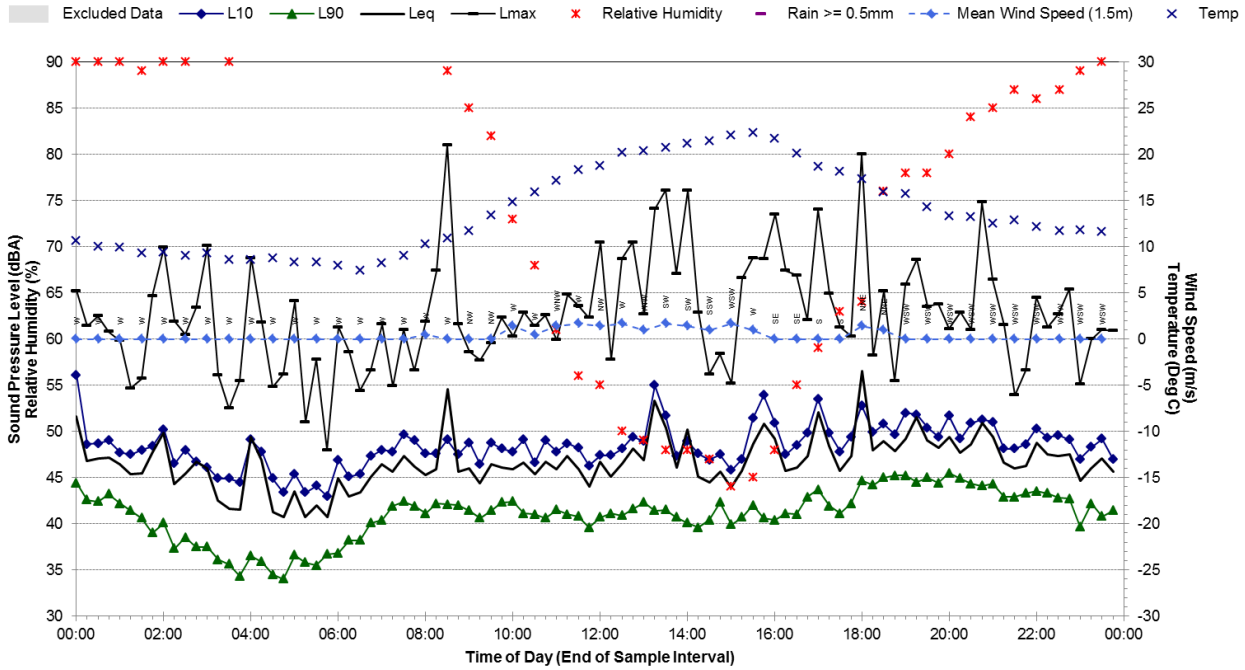

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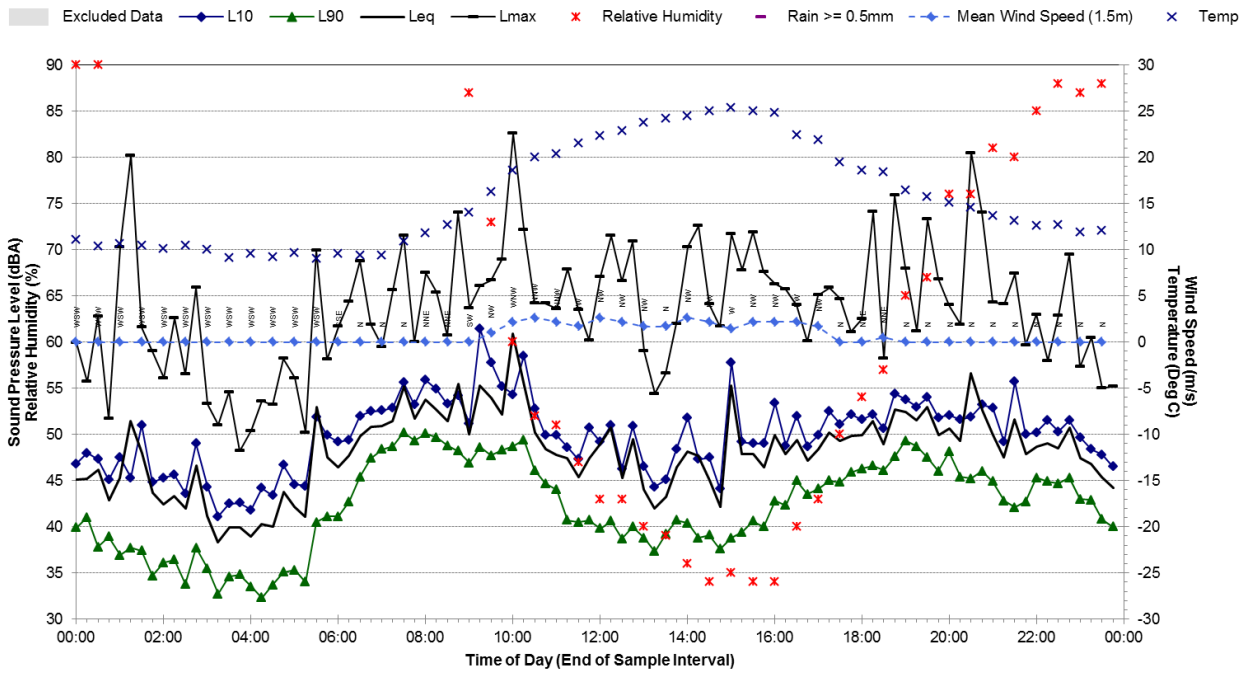

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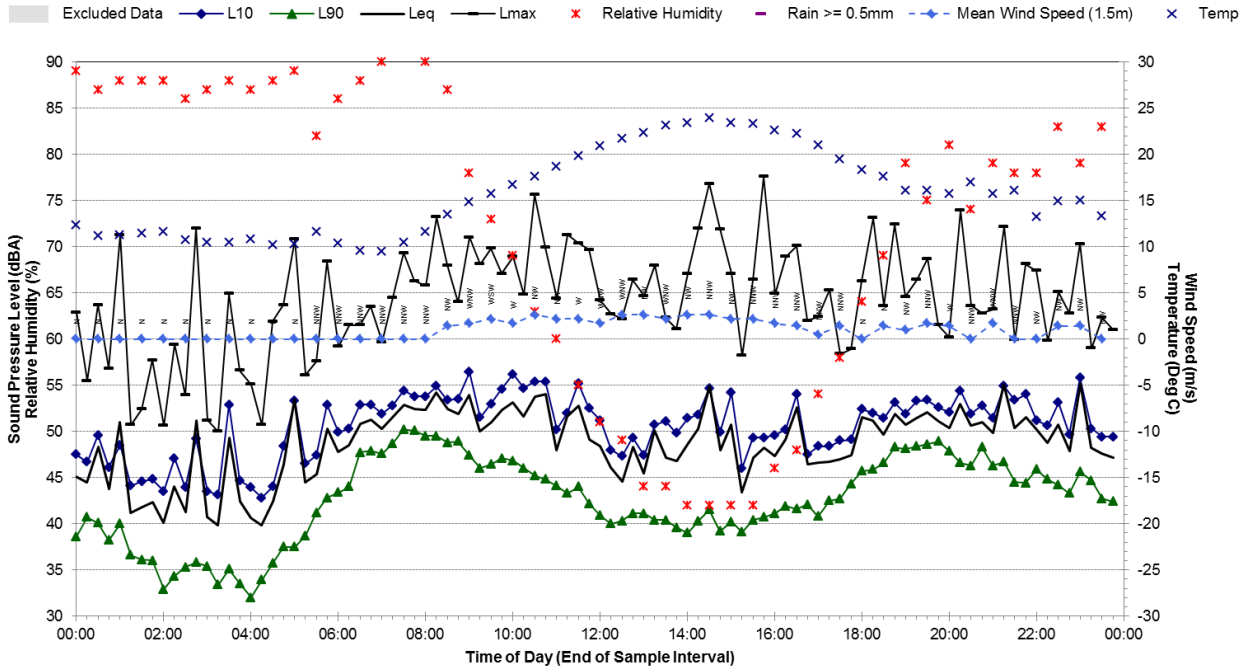

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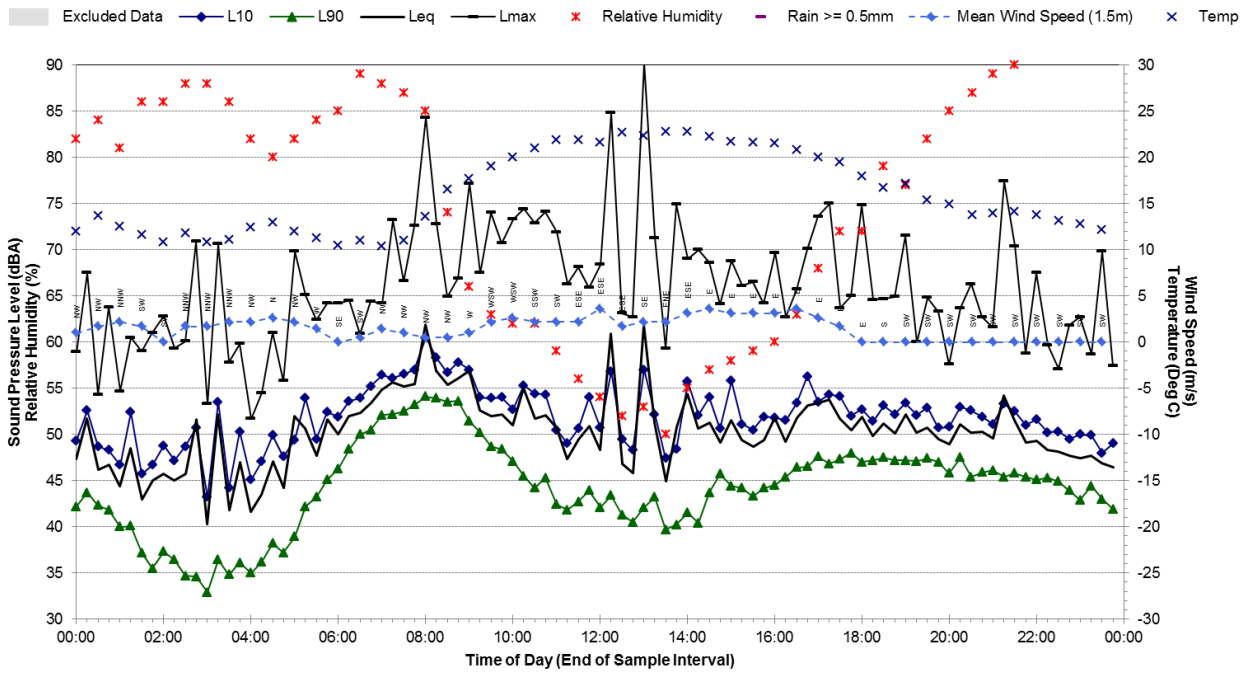

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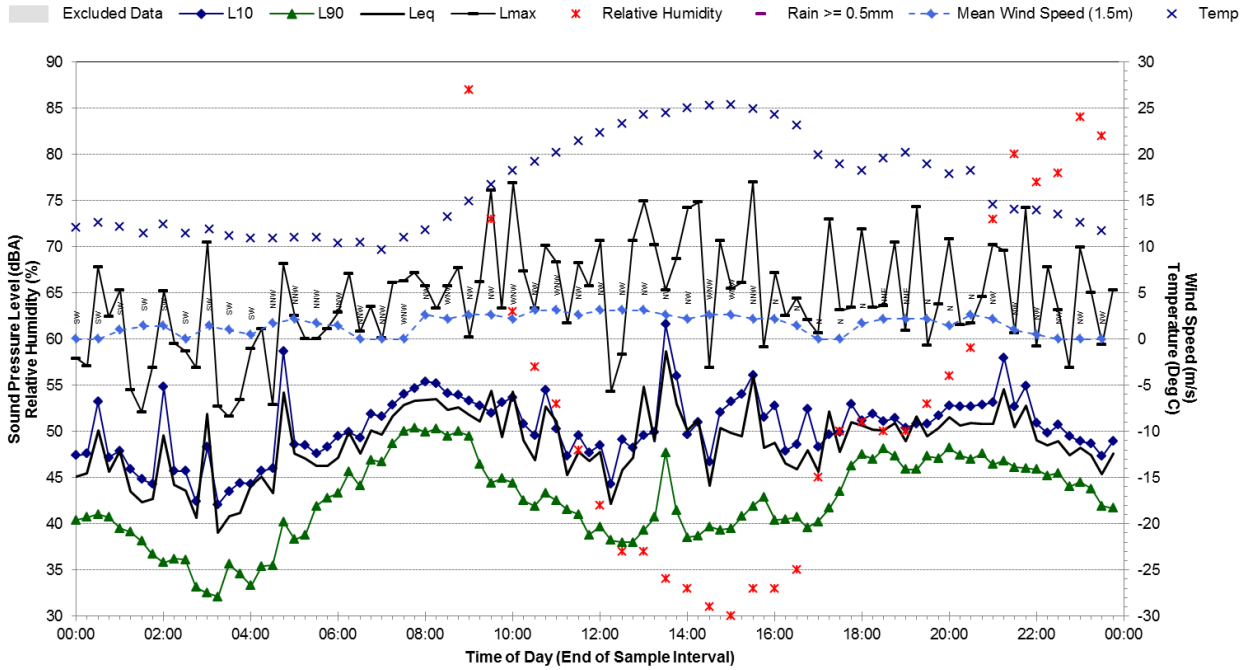

Statistical Ambient Noise Levels

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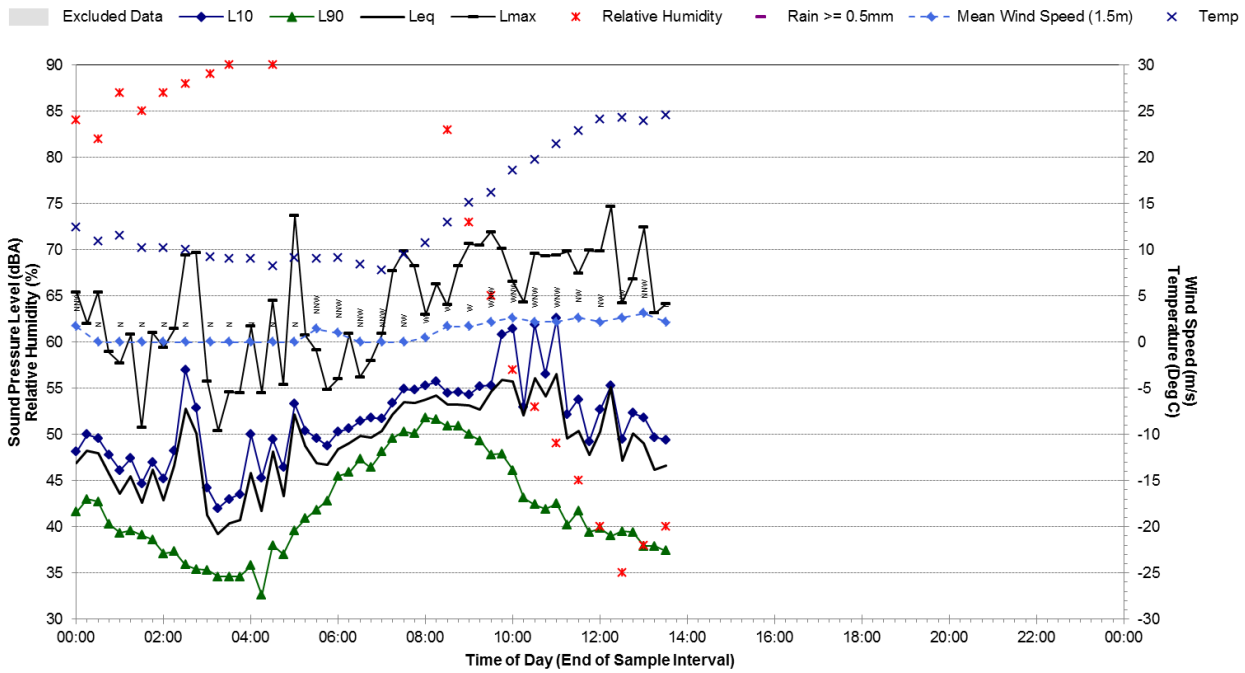
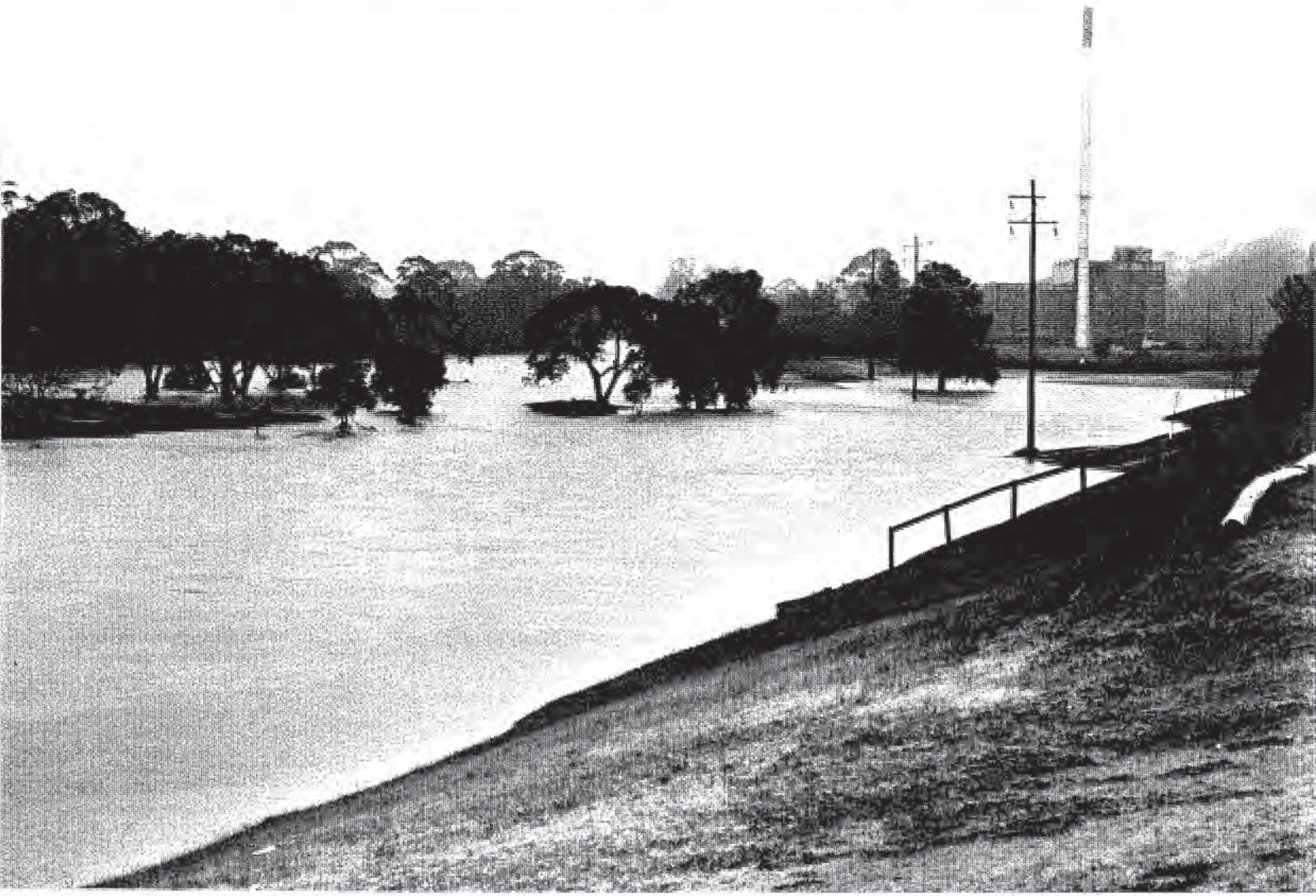


Attachment 2.8

Upper Georges River Flood Study



Prepared By

Department of Land & Water Conservation

In conjunction with

Liverpool City Council

December 2000

Upper Georges River Flood Study

Foreword

The State Government's Flood Policy aims to reduce the impacts of flooding and flood liability on individual owners and occupiers. The policy encourages the development of solutions to existing flood problems in developed areas, and strategies for ensuring that new development is compatible with the flood hazard and does not create additional flooding problems in other areas.

Under the policy, local government has responsibility for managing flood liable land. Liverpool City Council's floodplain management committee has assisted Council in this task. The committee membership comprises a wide range of technical and community based skills.

The policy provides for technical and financial support by the State Government for a number of activities that include:

1. Preparation of a flood study to determine the nature and extent of the flood problem.
2. Preparation of a floodplain management study to evaluate management options in respect of both existing and future development.
3. Preparation of a floodplain management plan that involves formal adoption by Council. The plan may include provision for structural and non-structural options.
4. Implementation of the plan.

The Upper Georges River Flood Study constitutes the first stage of the floodplain management process for the Upper Georges River. The study has been prepared by the Department of Land and Water Conservation in conjunction with Liverpool City Council. It provides the basis for future management of flood liable land within the study area with regard to flooding.

Upper Georges River Flood Study

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1.0 INTRODUCTION

Numerous studies have been undertaken on the Georges River. Almost all of these studies have been confined to the area downstream of Liverpool. These have ranged from flood frequency analysis, to various mathematical and physical model studies. The most comprehensive and up-to-date study is the Georges River Flood Study [PWD 1991], completed by the Water Research Laboratory for the Public Works Department.

The Georges River Flood Study used a physical model of the Georges River to determine design flood levels, between Liverpool and Picnic Point. Flow hydrographs were determined using hydrologic computer modelling, in order to represent major inflows to the physical model. Flow hydrographs were input at Liverpool weir, Cabramatta Creek, Prospect Creek, and Harris and Williams Creeks. Whilst the entire catchment was considered for the hydrologic modelling, flood levels could only be defined throughout the extent of the physical model, which was limited to the area between Picnic Point and Liverpool.

Although there is limited flood liable development in the area upstream of Liverpool, there have nevertheless been various requests for flood advice. This has mainly been in relation to new development immediately upstream of the Liverpool bridge, the design of the sewerage treatment works at Glenfield, and in connection with the construction of bridges over the Georges River at the M5 Motorway and the East Hills Railway line. Recently there have been requests for flood level information in connection with the possible replacement of the Cambridge Avenue causeway, and other proposals that could affect flood behavior elsewhere in the catchment.

Previous design flood level estimates have been provided by various simplistic methods. These methods have relied on establishing a likely flood gradient in the upstream reach, usually on the basis of historical flood records, and using this as a basis to extrapolate design flood levels upstream of Liverpool.

In 1997 Liverpool City Council sought the assistance of the Department of Land and Water Conservation to better define the flood behavior upstream of Liverpool. Following this request the Department, in conjunction with Liverpool City Council and Council's Floodplain Management Committee, undertook the Upper Georges River Flood Study. The study determines design flood levels between Liverpool weir and the confluence with the Bunburry Curran Creek.

2.0 BACKGROUND INFORMATION

2.1 Study Area

The Georges River has a catchment area of 360 km^2 upstream of Liverpool. This compares with a total catchment area of 890 km^2 near its mouth at the Como Bridge. A catchment plan is shown on Figure 1.

The study area for hydraulic modelling is the Upper Georges River, between the Liverpool weir and the confluence with the Bunburry Curran tributary, which drains the urban area of Campbelltown. This section of the river, shown on Figure 2, is 6.5 km long. The river is deeply incised with little or no floodplain.

Most development that adjoins the river is confined to the downstream end, around Liverpool. This mainly consists of residential units, houses and small industrial premises on the western side of the river. Larger scale commercial and industrial premises occupy the eastern side. Further upstream, the Casula Golf Course, Powerhouse Museum and Glenfield tip, occupy the western side. The army, and the school of military engineering, occupies the remainder of the eastern side of the river.

A number of structures cross the river, including the Liverpool weir, Newbridge Road bridge, the M5 motorway, the East Hills Railway line, and the Cambridge Avenue Causeway. The main southern railway also runs parallel to the river on the western side.

Liverpool weir was constructed in 1836 for water supply purposes. It also provided the only causeway crossing of the river at this location. The weir is of some historical significance and has been recognised as such by the National Trust and the Australian Heritage Commission. The crest of the weir is at a level of 2.78m AHD. A detailed rating curve of flow versus level has been developed for the weir through gauging exercises and other physical model studies [PWD, 1991].

The Newbridge Road and M5 motorway bridges are high level structures with bridge decks above design 100 year flood levels. The M5 bridge was constructed prior to 1986, and is currently being duplicated.

An army footbridge used to cross the Georges River further upstream. Army personnel used the footbridge as a link to Casula railway station. It was also purported that the bridge was used as a gauging station by the army, although no flood records were uncovered. The bridge was washed away in the 1986 flood.

The East Hills railway line was extended to cross the Georges River in 1986. Whilst the present bridge does not provide a restriction to floodwaters, its construction in 1986 coincided with the 1986 flood. At this time, most of the river appears to have been dammed off to facilitate construction of the bridge. This would have had an impact on flood behaviour during the August 1986 flood.

The Cambridge Avenue Causeway is one of the more significant structures that cross the river in terms of flood impacts. The structure consists of 4, 10m wide by 1.2m high culverts. It is constructed over a rock shelf which naturally outcrops above water level at this location.

The road over the culvert forms a fairly low level causeway, which would be overtopped on a regular basis.

2.2 Previous Studies

Flood behaviour on the Georges River has been extensively studied since the mid 1960's.

The first major investigation of flooding on the Georges River was undertaken by Scholer in 1966 [Scholer 66]. Scholer investigated flood levels at Liverpool, and proposed a number of minor works and a flood prediction model to assist with flood warning services for Liverpool.

During the late 1960's much research was carried out using flood frequency analyses of the historical records at Liverpool. Munro [Munro 67,68], Stewart [Stewart 68] and Rowe and Ennis [Rowe & Ennis 70] undertook the main investigations. The results of the different analyses varied significantly, mainly as a result of how some of the earlier doubtful records were treated and the length of record incorporated in the analysis.

In 1978 Public Works commissioned consultants Sinclair Knight and Partners to investigate flooding between Liverpool and East Hills. The study [SKP 78] reviewed earlier flood frequency investigations at Liverpool, and adopted Munro's 1968 analysis. The 1956 flood gradient was then used to relate flood levels at Liverpool to flood levels further downstream. Sinclair Knight & Partners undertook a further valley wide assessment of possible flood mitigation works and measures in 1981 [SKP 81].

The Public Works Department constructed a number of physical models to investigate flood behaviour around the Chipping Norton Lakes Scheme, and other for other areas where there were known flood problems. In 1983 Public Works commissioned the University of NSW Water Research Laboratory to undertake an overall flood investigation for the Georges River, between Liverpool and Picnic Point [PWD 91]. The study utilised mathematical hydrologic models to estimate inflows to the floodplain, and a single physical hydraulic model of the Georges River and its main tributaries to determine flood heights.

Available studies on flood behaviour upstream of Liverpool are less common. Some information is available from research and limited investigations undertaken in connection with the construction of the Sewerage treatment works at Glenfield [Rowe & Ennis, 75], and the extension of the East Hills Railway bridge over the Georges River. These have largely been based on a few isolated records of floods reported to have occurred in the late 19th century, and using these levels as benchmarks for the design of works.

2.3 Historical Flood Data

The Georges River has a history of flooding, with a wealth of data available at the Liverpool weir. A histogram of recorded flood heights at Liverpool is presented in Figure 3, along with the current estimate for the 100 year flood event.

The largest recorded flood on the Georges River is believed to have occurred in 1873. On the basis of literature searches, this was probably the greatest flood since about 1800. The 1873

flood level at Liverpool was 1m higher than the current estimate for the design 1% flood. Another large flood, similar to the estimated 1% flood, occurred in 1898. Other similarly large floods were reported to have occurred in 1887 and 1889, although these records are less reliable.

Flooding this century has been considerably less severe, with the largest event occurring in 1956. More recently, significant floods occurred in 1986 and 1988. The Public Works Department collected extensive flood data for both floods. The available data is presented in separate reports for the two events [PWD 87,89], consisting of gauged flows, stage hydrographs, and flood debris marks at numerous locations from Liverpool to Picnic Point.

Whilst there is extensive flood data available for Liverpool, there is less information available further upstream. There are some limited reports [Rowe and Ennis, 1975] of record floods occurring in the late 19th century towards the upstream limit of the study area. These isolated levels are mainly based on the recollections of one or more persons that lived in the area at the time, and subsequent survey of reported levels many years later. In some cases the reported levels have been assumed to be of the 1873 flood, although there were a number of floods which occurred around the same time.

The most reliable flood information in the upstream reach is available for the 1986 and 1988 floods. Several photographs of these floods have been recovered from residents living in the area (Cover and Photos 1 to 4). Whilst there was sometime confusion as to whether the photos were of the 1986 or 1988 floods, both floods were of a similar magnitude. The most complete and reliable flood records exist at the Cambridge Avenue causeway, where the State Emergency Services monitored both flood events. The records consist of regular flood height readings from the flood gauges that are maintained by Campbelltown City Council at this location.

2.4 Topographic and Survey Information

Available topographic maps and aerial photography that was used in the course of this study, is indicated below:

1. 1 : 4,000 scale Orthophotomaps, with 2m contour intervals, reference East Hills U9137 - 1,2,4,5,7.
2. 1 : 10,000 scale Orthophotomap, with 4m contour intervals, reference East Hills U9137.
3. 1 : 25,000 scale Topographic Map, with 10m contour intervals, reference Liverpool 9030-11-S
4. 1 : 10,000 scale aerial photography, especially flown in 1997 by Southern Aerial Surveys Pty Ltd, at an altitude of 3,500 ft and a scale of 1:5,000

River cross sections were derived from photogrammetric analysis of the 1997 aerial photography, and supplemented by hydrographic survey of the river by Liverpool City Council. These sections form the basis for a hydraulic model that has been used to analyse flood behaviour throughout the study area. The location and reference number of each section is indicated in Figure 5. A plot of each section is also included in Appendix 1.

Photo 1 - Flooding under railway bridge at Woodbrook Rd (1986 or 1988 flood)

Photo 2 - Flooding across Casula Golf Course (1986 or 1988 flood)

Photo 3 - Flooding at Cambridge Avenue (peak of 1986 flood)

Photo 4 - Flooding of west bank, downstream of Cambridge Avenue (1986 flood)

3. METHODOLOGY

The adopted modelling approach for this study is to determine estimates of flow hydrographs in the Georges River, and to use these hydrographs as input to a hydraulic model representing the river, which then computes flood levels throughout the study area.

Estimates of flow hydrographs for the Georges River are already available at Liverpool from previous hydrologic analyses undertaken as part of the Georges River Flood Study [PWD,1991]. The estimates were derived using the Watershed Bounded Network Model. The catchment area upstream of Liverpool was divided into 49 separate sub-areas for the analysis. Flow hydrographs were generated for both design floods and recent historic floods. The Public Works Department also undertook extensive gauging exercises to measure flood flows immediately downstream of Liverpool, for both the 1988 and 1986 flood events.

As there are no major tributary inflows between Liverpool and the upstream study limit, at the Bunburry Curran tributary, the flow hydrographs determined from the 1991 study have been used for the current study. No further flow or rainfall analysis has been necessary for this investigation.

The flow hydrographs have been input to a MIKE-11 computer model in order to determine flood levels throughout the study area. MIKE-11 is a dynamic hydraulic model developed by the Danish Hydraulics Institute. It is a widely accepted model that has been used in numerous studies both in Australia and other overseas countries. The MIKE-11 model consists of data describing the river topography, information on structures such as bridges and weirs, and inflow hydrographs to the river for a particular flood.

All models require calibration and verification to be able to confidently predict flood behaviour. This involves modelling historic flood events and comparing computed results with observed flood levels. Model parameters are then adjusted to improve the "fit" between computed and recorded levels.

The best data available for model calibration and verification is for the 1988 and 1986 flood events. Complete stage hydrographs are available at Cambridge Avenue for both events, allowing an ideal comparison between observed and computed results.

The approach taken in this study has been to calibrate the MIKE-11 model to the 1988 flood by adjusting model parameters, principally the Manning's roughness coefficient. The model has then been verified with the 1986 flood, without further adjustment to these parameters.

After calibration and verification, design flow hydrographs have been input to the model to determine estimates for design flood levels throughout the study area. Design flood level estimates have been computed for the 1 in 100 year flood, 1 in 50 year flood and 1 in 20 year flood. An estimate has also been prepared for probable maximum flood.

4.0 FLOOD FLOW ESTIMATES

All estimates of flood flows have been extracted from the Georges River Flood Study [PWD,1991]. These estimates were based on hydrologic modelling of the Georges River using the Watershed Bounded Network Model. The catchment upstream of Liverpool was subdivided into 49 separate sub-areas for the analysis, as represented in Figure 4. A complete description of the modelling technique is available in the 1991 flood study report.

Flood flow estimates are required for both historic and design flood events. The historic estimates are required for calibration and verification of the MIKE-11 hydraulic model. The 1988 flood was selected for calibration, and the 1986 flood selected for verification. The Public Works Department also gauged these two floods at the William Long Bridge, which is just downstream of Liverpool weir.

4.1 1988 Flood Flows

Heavy rain commenced falling over the Georges River catchment on the 28th April 1988. This continued for 3 days, with the heaviest falls occurring on the 30th April. Nine pluviometer stations within the Georges River catchment recorded the temporal pattern for the storm, whilst total rainfall depths were recorded at numerous daily read rain gauges. The heaviest rainfalls were recorded in the upper catchment, with 440mm recorded at Darkes Forest. The rain was less intense over the lower catchment area, with 330 mm recorded at Liverpool.

River flood heights gradually rose over the first 2 days, and then rose more rapidly on the 30th April, coinciding with the heavier rainfall intensities. The peak of the flood occurred around 6pm at Liverpool, which was recorded at 7.3m AHD.

The estimated 1988 flow hydrograph, for the upstream limit of the study area, is represented in Table 1. The hydrograph is based on that given in the 1991 flood study for Liverpool, advanced by 1 hour to allow for time differences over the 6.5 km reach upstream of Liverpool.

4.2 1986 Flood Flows

The 1986 flood was a result of heavy rain falling over the Georges River catchment between the 4th August and 7th August. The rainfall was fairly evenly distributed over a 66 hour period. It was recorded at 5 pluviometers within the Georges River catchment, and numerous daily read stations. The distribution of rainfall over the catchment was fairly similar to that experienced in the 1988 flood, in that the heaviest rainfall was recorded in the upper parts of the catchment. At total rainfall of 565 mm was recorded at Cobbong, reducing to 380 mm at Liverpool.

The flood peaked at a height of 7.4m AHD at Liverpool, at about 10:00am on 6th August.

The estimated 1986 flow hydrograph at the upstream limit of the study area is represented in Table2.

Table 1 - Flow Hydrograph for 1988 Flood [PWD, 1991]

Date	Time (hrs)	Flow (m^3/s)	Date	Time (hrs)	Flow (m^3/s)
29/4/88	0:00	179	30/4/88	6:00	369
	1:00	200		7:00	415
	2:00	199		8:00	484
	3:00	189		9:00	581
	4:00	173		10:00	650
	5:00	156		11:00	706
	6:00	137		12:00	754
	7:00	129		13:00	795
	8:00	128		14:00	849
	9:00	127		15:00	870
	10:00	140		16:00	830
	11:00	159		17:00	839
	12:00	180		18:00	810
	13:00	208		19:00	764
	14:00	230		20:00	723
	15:00	248		21:00	665
	16:00	254		22:00	615
	17:00	263		23:00	572
	18:00	263		24:00	516
	19:00	262	1/5/88	1:00	453
	20:00	261		2:00	381
	21:00	254		3:00	311
	22:00	250		4:00	241
	23:00	257		5:00	181
	24:00	265		6:00	145
30/4/88	1:00	273		7:00	121
	2:00	285		8:00	105
	3:00	296			
	4:00	318			
	5:00	344			

Table 2 - Flow Hydrograph for 1986 Flood [PWD, 1991]

Date	Time (hrs)	Flow (m^3/s)	Date	Time (hrs)	Flow (m^3/s)
5/8/86	4:00	0	6/8/86	10:00	800
	5:00	0		11:00	760
	6:00	0		12:00	695
	7:00	0		13:00	635
	8:00	45		14:00	580
	9:00	50		15:00	550
	10:00	55		16:00	550
	11:00	68		17:00	575
	12:00	95		18:00	595
	13:00	125		19:00	590
	14:00	180		20:00	565
	15:00	235		21:00	530
	16:00	280		22:00	465
	17:00	330		23:00	405
	18:00	375		24:00	340
	19:00	420	7/8/86	1:00	275
	20:00	465		2:00	225
	21:00	510		3:00	185
	22:00	545		4:00	165
	23:00	600		5:00	145
	24:00	670		6:00	131
6/8/86	1:00	730		7:00	118
	2:00	760		8:00	105
	3:00	785			
	4:00	795			
	5:00	815			
	6:00	820			
	7:00	825			
	8:00	840			
	9:00	835			

4.3 Design Flood Flows

Design flow hydrographs were also computed in the 1991 flood study. Storm durations ranging from 12 hours to 72 hours were considered, with the 36 hour storm producing the highest peak flows at Liverpool.

Design flows calculated from the 1991 study are also applicable to the current study. Complete flow hydrographs for the 20 year, 50 year and 100 year flood, along with an estimate for the extreme flood, are represented in Table 3. These are based on the Liverpool hydrographs, advanced by 1 hour to allow for time differences through the study area. The extreme flood is based on estimates of the probable maximum precipitation for the catchment.

Table 3 - Design Flow Hydrographs (m^3/s) [PWD, 1991]

Time (hrs)	20 Year Flood	50 Year Flood	100 Year Flood	Extreme Flood
0	0	0	0	1
1	0	0	0	35
2	0	0	0	116
3	0	0	0	275
4	0	0	0	574
5	0	0	0	1006
6	0	0	0	1503
7	0	0	0	1986
8	0	1	2	2412
9	1	4	7	2749
10	3	9	15	2992
11	6	16	26	3147
12	12	30	49	3243
13	23	56	90	3311
14	43	104	159	3341
15	79	179	262	3367
16	158	309	426	3366
17	295	499	653	3377
18	487	736	928	3391
19	729	1010	1237	3407
20	986	1281	1537	3389
21	1208	1500	1769	3358
22	1339	1614	1877	3349
23	1368	1620	1861	3347
24	1313	1537	1747	3364
25	1197	1393	1567	3342
26	1049	1220	1365	3310
27	901	1052	1172	3237
28	764	898	998	3150
29	643	763	847	3058
30	541	464	717	2976
31	454	547	605	2910
32	381	461	510	2828
33	320	389	429	2718
34	270	327	360	2596
35	227	275	302	2479
36	192	232	253	2307
37	162	195	213	2071
38	138	165	179	1792
39	117	140	152	1506
40				1244
41				1014
42				831
43				679

5.0 HYDRAULIC ANALYSIS OF FLOOD LEVELS

Flood levels in the river are computed by inputting flow hydrographs into a hydraulic model. For this study, the MIKE-11 hydraulic model has been selected as the most appropriate model in which to analyses flood behaviour in the Upper Georges River. MIKE-11 is an unsteady state, dynamic model, which is capable of modelling both the rise and fall of the flood, as well as accounting for any flood storage effects that may occur along the river.

5.1 Mike-11 Model Description

The MIKE-11 model consists of 40 cross sections that describe the topography of the river. These sections are spaced at intervals of approximately 150 to 200m. The location of cross sections is shown on Figure 5. They have been numbered P1 to P42, and have also been assigned a chainage, with the upper cross section (P1) having an arbitrary chainage of 100.000 km and the most downstream section (P42) having a chainage of 106.530 km. These sections have been reproduced in Appendix 1.

Additional information is used to describe any structures, such as bridges, that are likely to have an impact on flood levels. Whilst there are several road and railway bridges that cross the river, only the Cambridge Avenue causeway is likely to have an impact, particularly in smaller floods. The other structures have been ignored for modelling purposes, with the exception of the East Hills railway bridge, where a large part of the river was dammed off to facilitate its construction in 1986. Modelling of the 1986 flood has included this restriction.

The model requires boundary conditions at both the upstream and downstream limits of the study area. The upstream boundary consists of a flow hydrograph, such as presented in Tables 1, 2 and 3. The downstream limit usually consists of a stage hydrograph, but as there is a weir at the downstream limit of the study area, a rating curve of stage versus flow is appropriate. A detailed rating curve of the Liverpool weir is available, and is represented on Figure 6. The rating curve has been developed over many years, through flood gaugings carried out by both the Water Board and the Public Works Department. The highest gauged flows were the 1988 and 1986 floods. Extrapolation beyond this level has been achieved through physical modelling, undertaken as part of the Georges River Flood Study [PWD,1991].

There are a number of parameters that can be adjusted in the MIKE-11 model. The main parameter is the Manning's Roughness coefficient, which allow for river and overbank roughness characteristics to be accounted for. Initial values are usually determined based on experience or reference to standard hydraulic texts. The parameters are fine tuned after comparing observed and calculated results for one or more historic floods.

The adopted approach for this study has been to calibrate the MIKE-11 model to the April 1988 flood. The model has then been verified against the August 1986 flood, without further modification to the calibration parameters.

5.2 1988 Model Calibration

The April 1988 inflow flood hydrograph (Table 1) was input to the MIKE-11 model and

flood levels computed throughout the study area. Computed flood hydrographs were compared with the hydrograph recorded by the State Emergency Services at Cambridge Avenue. Calibration was undertaken by adjusting Manning's roughness coefficients until a reasonable match between computed and observed levels was achieved.

First attempts at calibration produced computed flood levels that were lower than observed levels. Roughness coefficients were increased to improve the comparison, but it was not completely possible to match peak heights without unrealistically high values of roughness coefficients. The hydrographs show remarkably similar shapes, with computed levels slightly higher than observed levels during the rise and fall of the flood, but about 0.4m lower at the peak of the flood. A comparison of the two hydrographs is indicated on Figure 7.

Flow estimates were reviewed by comparison with flows gauged by the Public Works Department for this event, immediately downstream of Liverpool. Whilst there may also be inaccuracies associated with gauging river flows, the maximum flow gauged was some 7% higher than the peak flow estimates provided from the 1991 flood study. Thus estimated peak flows may have been slightly underestimated for this event. An increase in estimated peak flows of 15% would be sufficient to match the observed peak height at Cambridge Avenue, as shown on Figure 8. This adjustment has been made to the 1988 flows only.

After allowing for a possible slight underestimation in peak flows from the 1991 study, the model was considered to be suitable calibrated.

5.3 1986 Model Verification

The August 1986 inflow flood hydrograph was input to the MIKE-11 model and flood levels computed throughout the study area. The computed stage hydrograph at Cambridge Avenue was compared against the levels observed by the State Emergency Services, without further adjustment to calibration coefficients.

The comparison between computed and observed hydrographs is indicated on Figure 9. The overall shape of the two hydrographs is very similar, with peak flood heights again being about 0.3m below the observed level. Possible reasons for the difference is an underestimation of the restriction caused by the construction of the East Hills railway bridge, or an underestimation of peak flows from the 1991 study. However, the comparison is generally good, and the model reasonably well verified.

5.4 Design Flood Level Estimation

Adopted roughness coefficients determined from the calibration and verification are represented in Table 4.

With the model suitably calibrated and verified, design flood flows (Table 3) were input to the model to calculate design flood levels throughout the study area. The sensitivity of the results from the model to possible variations in model parameters, or inaccuracies in estimating flood flows, were tested prior to adopting the design flood profiles.

The sensitivity tests are described in the following Section, with adopted design flood levels presented in Section 6.

Table 4 - Adopted Roughness Coefficients for MIKE-11

Section (Fig. 5)	Chainage (km)	Left Bank	Mid Channel	Right Bank
P1	100.000	0.09	0.04	0.13
P2	100.225	0.09	0.04	0.13
P3	100.450	0.09	0.04	0.13
P4	100.630	0.09	0.04	0.13
P5	100.835	0.10	0.04	0.13
P6	101.005	0.10	0.04	0.13
P6.4	101.057	0.10	0.04	0.13
P6.6	101.072	0.10	0.04	0.13
P7	101.120	0.13	0.04	0.13
P8	101.270	0.13	0.04	0.13
P9	101.440	0.13	0.04	0.13
P10	101.650	0.10	0.04	0.13
P11	101.795	0.10	0.04	0.10
P12	101.990	0.09	0.04	0.09
P13	102.185	0.09	0.04	0.10
P14	102.390	0.13	0.04	0.13
P15	102.535	0.13	0.04	0.10
P16	102.730	0.13	0.04	0.13
P17	102.930	0.13	0.04	0.06
P18	103.125	0.13	0.04	0.06
P19	103.230	0.10	0.04	0.06
P20	103.390	0.08	0.04	0.06
P21	103.555	0.06	0.04	0.13
P22	103.700	0.06	0.04	0.13
P23	103.860	0.06	0.04	0.10
P25	104.000	0.06	0.04	0.09
P26	104.095	0.06	0.04	0.08
P28	104.185	0.06	0.04	0.08
P31	104.355	0.06	0.04	0.08
P32	104.535	0.06	0.04	0.06
P33	104.785	0.06	0.04	0.06
P34	104.960	0.06	0.04	0.06
P35	105.160	0.06	0.04	0.06
P36	105.355	0.06	0.04	0.06
P37	105.560	0.06	0.04	0.08
P38	105.720	0.06	0.04	0.08
P39	105.960	0.06	0.04	0.06
P40	106.160	0.06	0.04	0.08
P41	106.330	0.06	0.04	0.09
P42	106.530	0.06	0.04	0.09

5.5 Sensitivity Analysis

A number of trial runs were undertaken on the 100 year design flood, to test the sensitivity of the model results to possible variations in model parameters.

The time step used for computations in the model is an important parameter that can affect model stability. Too long a time step can produce unstable results, whereas too short a time step will increase computation times and computer storage requirements. The time step adopted for this study was 5 minutes. The effect of reducing the time step to 1 minute was tested for the 100 year flood. This had almost no impact on computed results, with the results varying by no more than 0.01m

Tests were also undertaken to check the effects of possible variations in assumed Manning's roughness coefficients. The roughness throughout the entire model was varied by ± 12 % (representing a variation in the main channel from 0.035 to 0.045). Results of the tests at selected locations throughout the model are represented in Table 5.

Table 5 - Sensitivity Tests to variations in Manning's Roughness Coefficients, 100 year flood (m AHD)

Section	Location	- 12 %	Adopted	+ 12 %
P1	Upstream Limit	12.71	13.21	13.68
P6.4	Cambridge Ave	12.05	12.47	12.87
P20	Old Powerhouse	10.65	10.93	11.21
P32	M5 Bridge	10.20	10.43	10.65
P42	Liverpool Weir	9.24	9.24	9.23

Design flood levels are sensitive to assumed roughness coefficients. A variation in roughness of ± 12 % can result in flood level differences of up to 0.5m. The maximum difference is at the upstream end of the model, and reduces towards the Liverpool weir.

Sensitivity to possible variations in the estimates of flood flows was investigated in the calibration phase of modelling. A 15% increase in the estimate of the peak flow was sufficient to elevate the 1988 flood by approximately 0.3m at Cambridge Ave. Thus model results are also reasonably sensitive to possible errors in the estimation of flood flows.

The main reason that the model is sensitive to roughness coefficients and flood flow estimates is that the river is deeply incised, with floodwaters largely confined within the banks of the river. Even a small change in flood volume results in a significant change in flood levels.

6.0 EXISTING FLOOD BEHAVIOUR

Design Flood levels for existing catchment and river conditions is given in Table 6. Flood levels are provided for design flood events with a probability of occurrence of 1 in 20 years, 1 in 50 years and 1 in 100 years. Also included is an estimate for an extreme flood event. The extreme flood is based on estimates of the probable maximum precipitation for the catchment.

Longitudinal flood profiles for design floods are provided on Figure 10. Flow and stage hydrographs for the 1 in 100 year flood are represented in Figures 11 and 12.

Model results are very sensitive to possible variations in assumed channel roughness and flood flow estimates, particularly in the upper reaches of the study area. A minimum freeboard of at least 0.5m is recommended to be added to these levels when applied to minimum floor level controls.

Table 6 - Design Flood Levels (m AHD)

Section	Chainage	Location	1 in 20 yr	1 in 50 yr	1 in 100 yr	Extreme
P1	100.000	B.C tributary	11.7	12.5	13.2	16.4
P2	100.225		11.5	12.3	13.0	15.9
P3	100.450		11.5	12.3	12.9	15.9
P4	100.630		11.4	12.1	12.7	15.5
P5	100.835		11.2	11.9	12.6	15.5
P6	101.005		11.1	11.9	12.5	15.2
P6.4	101.057	Cambridge Av	11.1	11.9	12.5	15.2
P6.6	101.072		10.7	11.4	12.1	14.7
P7	101.120		10.7	11.4	12.0	14.7
P8	101.270		10.7	11.4	12.0	14.7
P9	101.440		10.5	11.4	11.7	14.2
P10	101.650	EH Railway	10.4	11.2	11.6	14.1
P11	101.795		10.2	11.1	11.5	13.9
P12	101.990		10.2	10.9	11.4	13.9
P13	102.185		10.2	10.9	11.3	13.8
P14	102.390		10.1	10.8	11.2	13.5
P15	102.535	Army Stand	10.0	10.7	11.1	13.4
P16	102.730		9.8	10.6	11.0	13.2
P17	102.930		9.8	10.5	11.0	13.2
P18	103.125		9.8	10.5	11.0	13.2
P19	103.230		9.8	10.5	11.0	13.2
P20	103.390	Powerhouse	9.7	10.4	10.9	13.1
P21	103.555		9.6	10.3	10.8	12.9
P22	103.700		9.6	10.3	10.8	12.9
P23	103.860		9.6	10.3	10.8	12.9
P25	104.000		9.5	10.2	10.7	12.8
P26	104.095		9.5	10.2	10.7	12.7
P28	104.185		9.5	10.1	10.6	12.7
P31	104.355		9.4	10.0	10.5	12.5
P32	104.535	u/s M5 bridge	9.3	9.9	10.4	12.5
P33	104.785		9.2	9.8	10.3	12.3
P34	104.960		9.1	9.7	10.2	12.1
P35	105.160		9.0	9.6	10.1	12.0
P36	105.355		8.8	9.4	9.8	11.9
P37	105.560		8.7	9.3	9.8	11.8
P38	105.720		8.6	9.2	9.7	11.8
P39	105.960		8.5	9.1	9.6	11.7
P40	106.160		8.4	9.0	9.5	11.5
P41	106.330		8.4	9.0	9.4	11.3
P42	106.530	Liverpool weir	8.3	8.9	9.2	10.8

7. References

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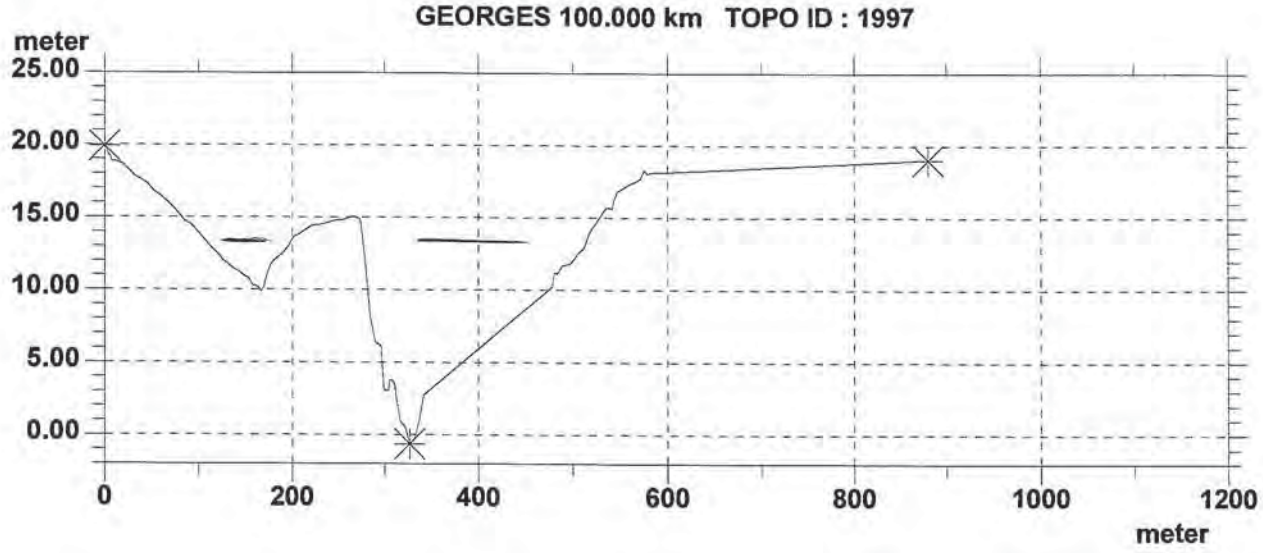
Appendix 1

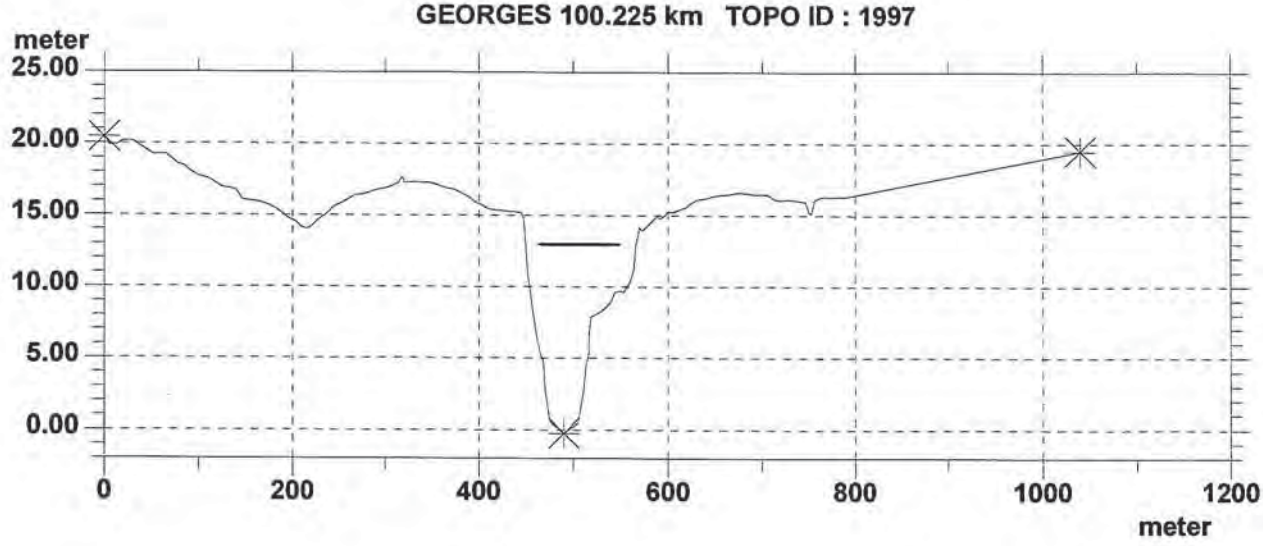
Cross Sections used in MIKE-11 Model

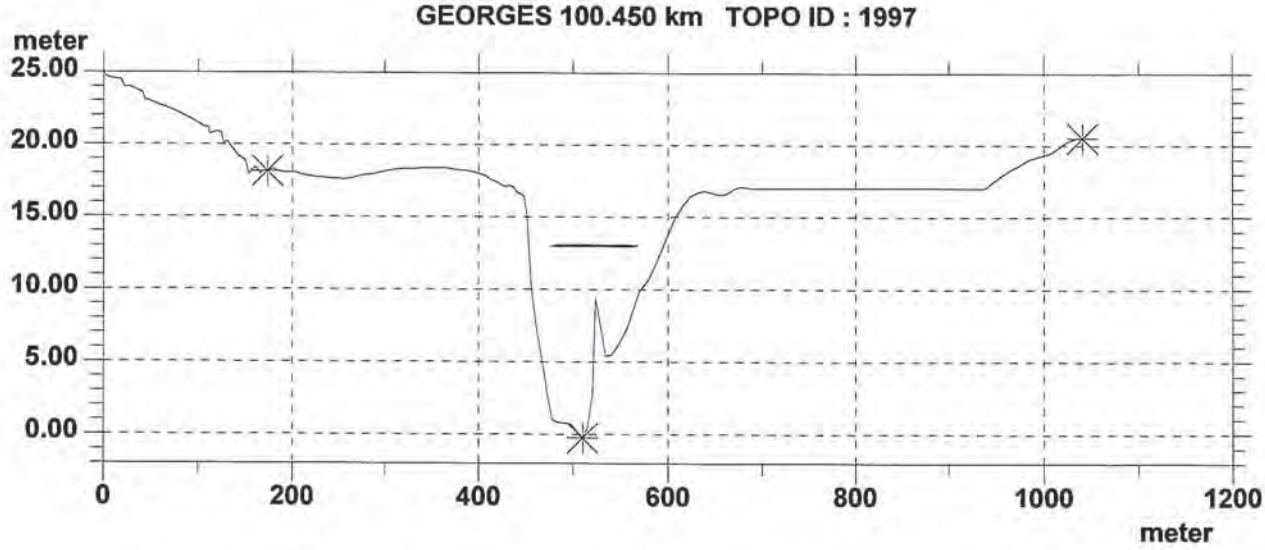
The following plots illustrate the cross sections that have been used in the MIKE-11 model. The sections start at Chainage 100.000 km. at the upstream end of the model and proceed in a downstream direction to Liverpool weir, at Chainage 106.530 km. Section names are available from Table 6, and locations are also represented on Figure 5.

The Sections are based on photogrammetric analysis of 1:5,000 scale aerial photography flown by Southern Aerial Surveys Pty Ltd in 1997, and hydrographic survey carried out by Liverpool City Council.

A short horizontal line has been placed on each Section, to represent the height of the design 100 year flood relative to the Section.







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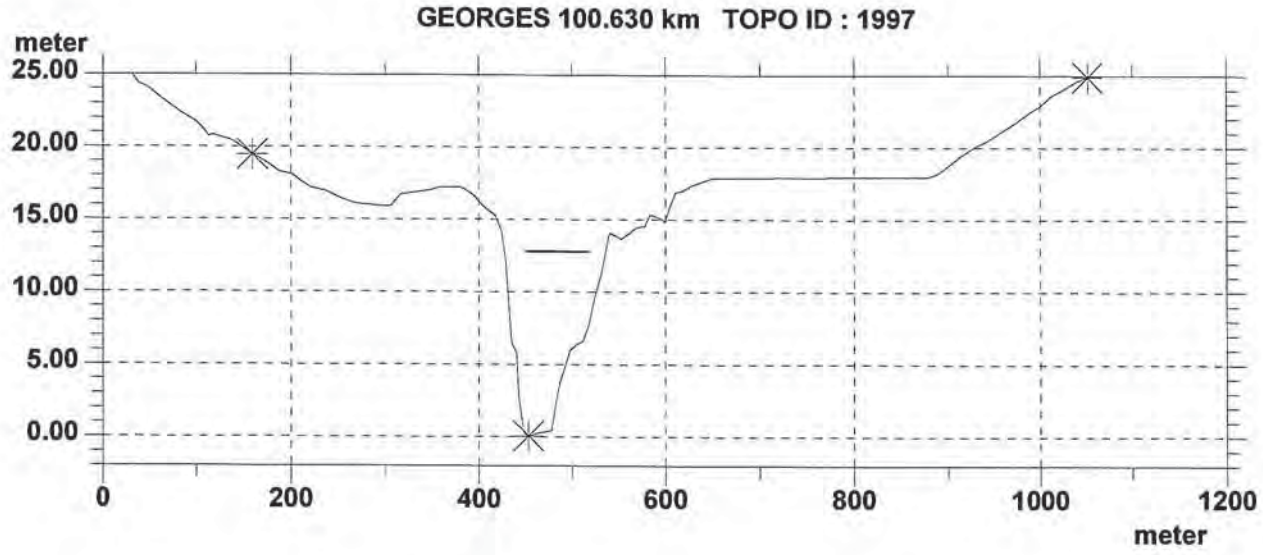

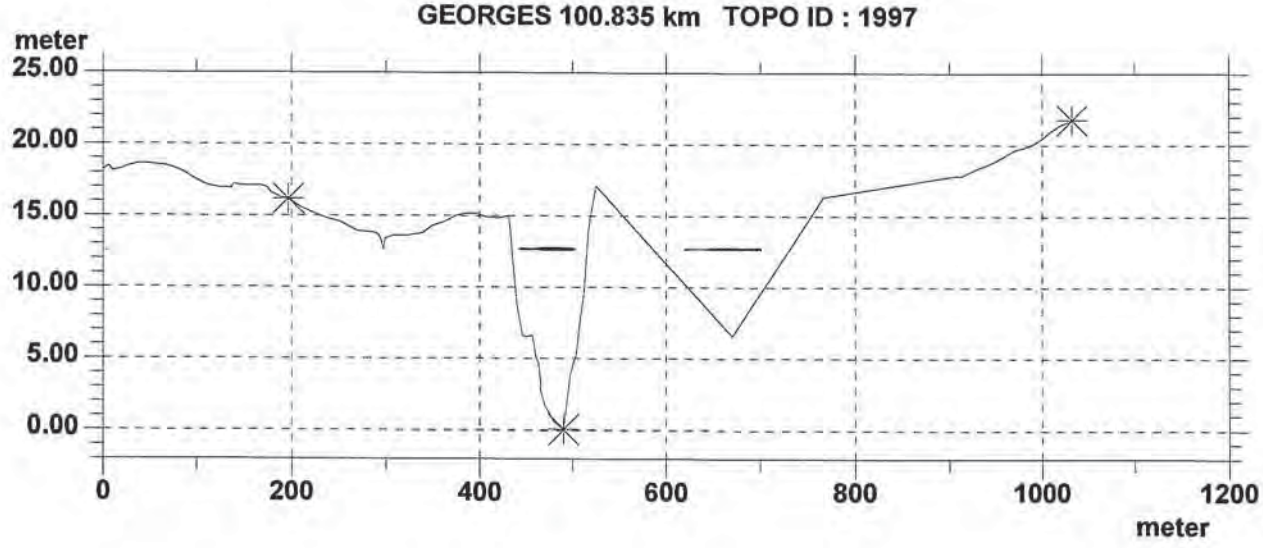

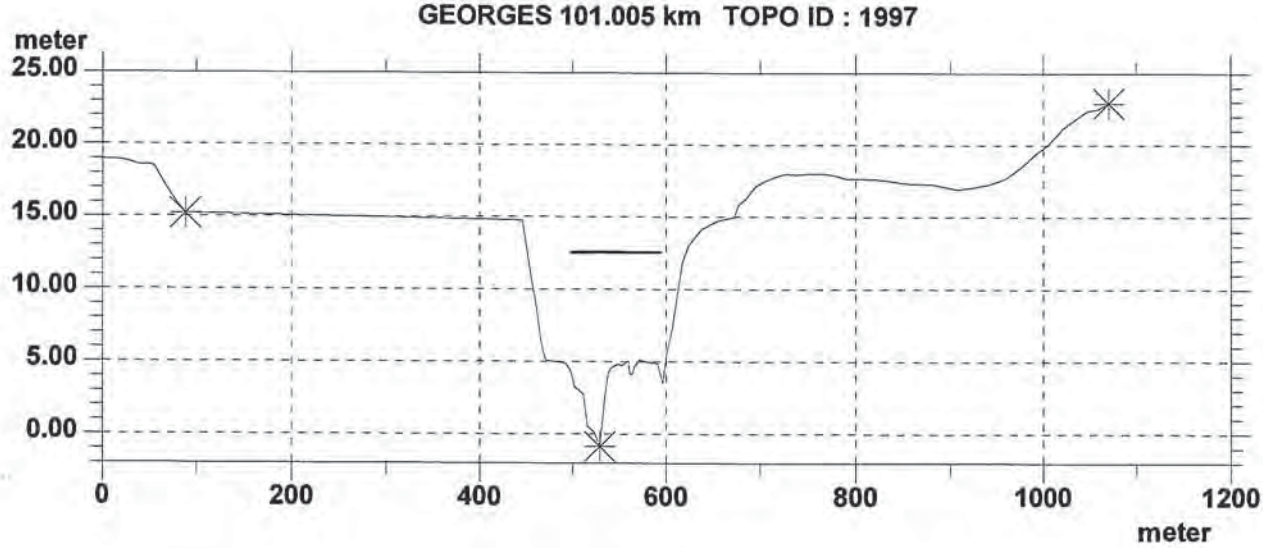

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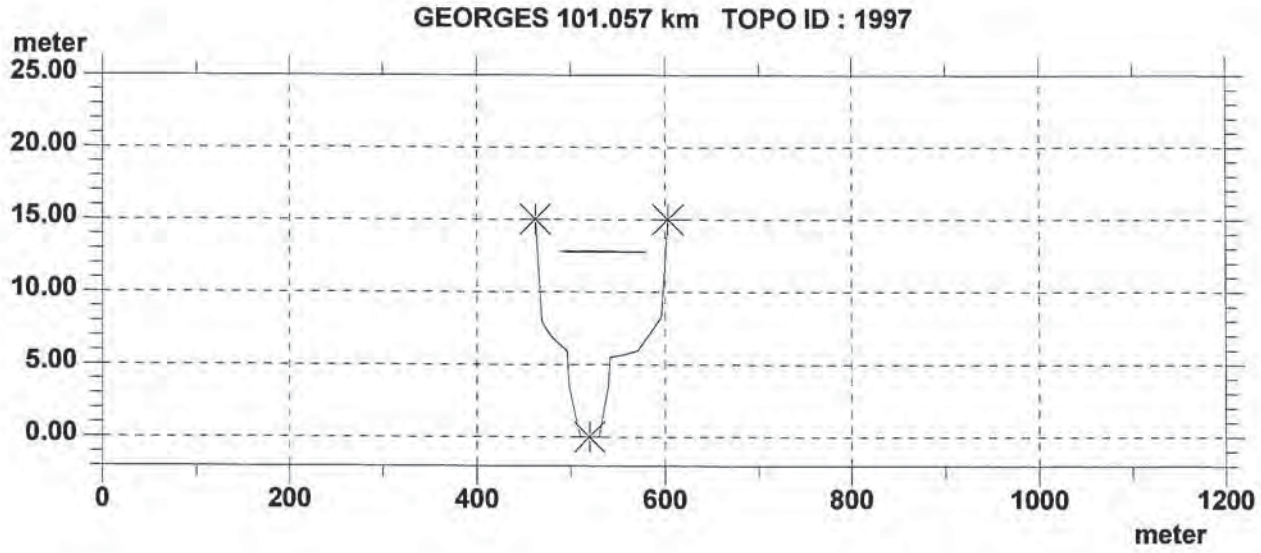

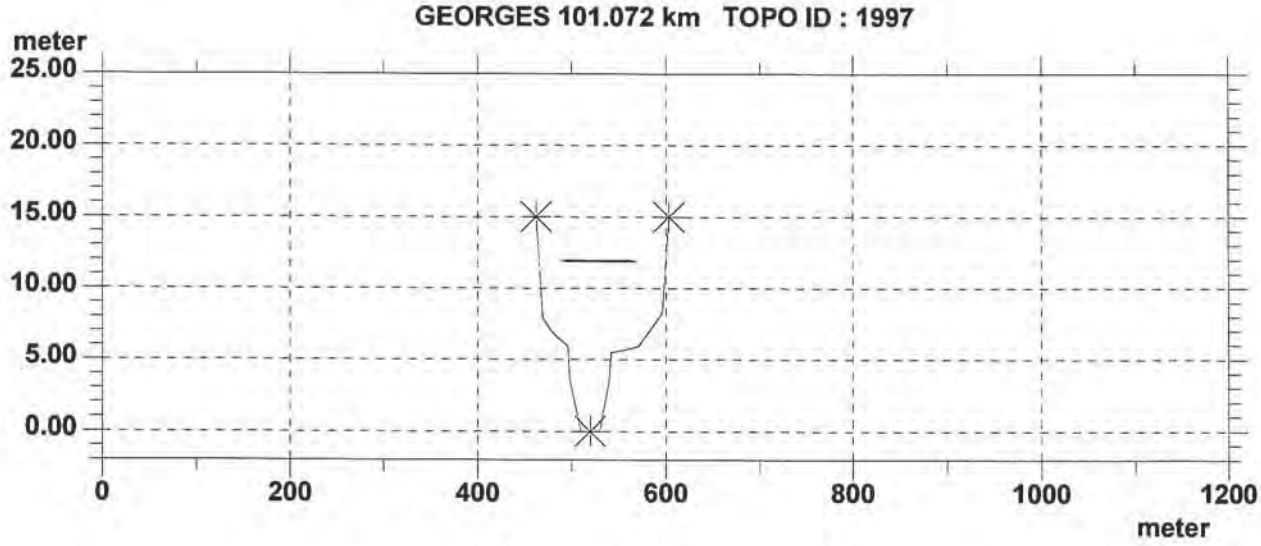

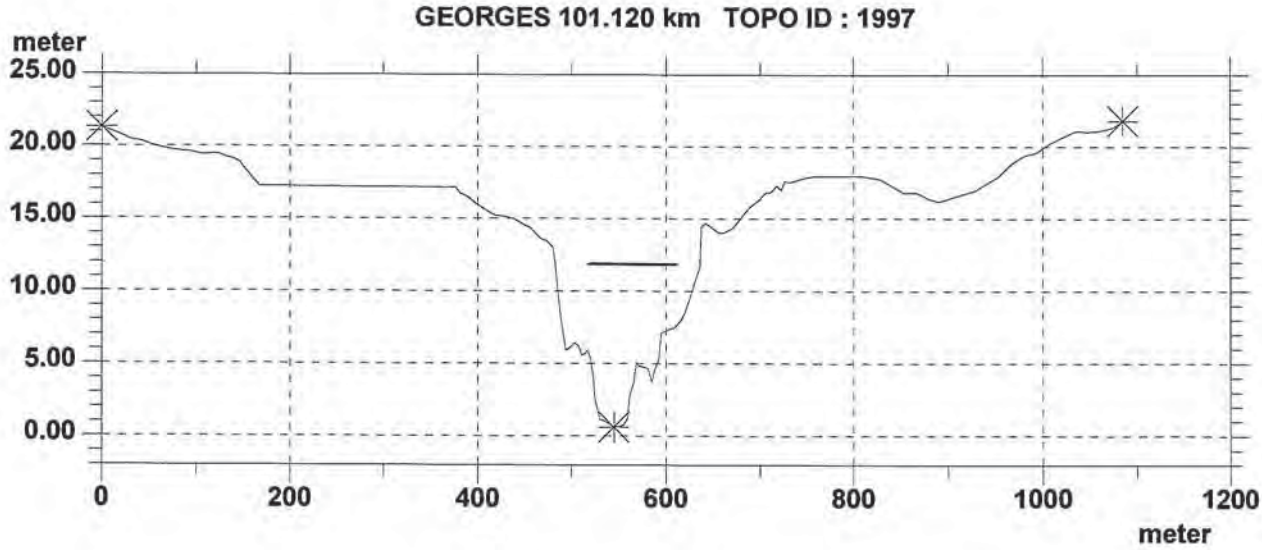

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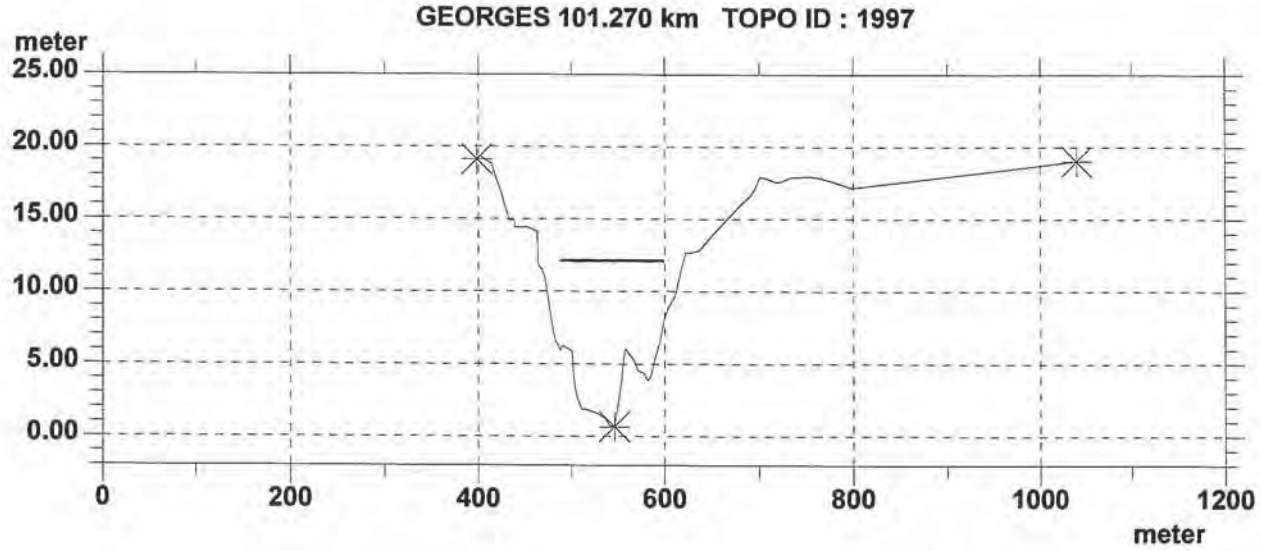

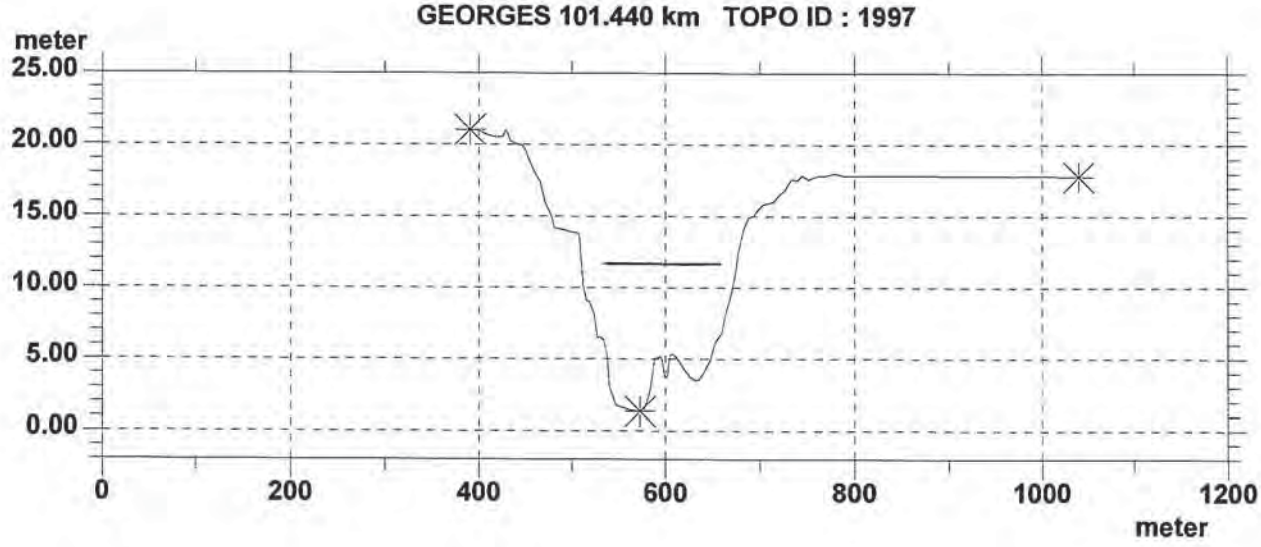

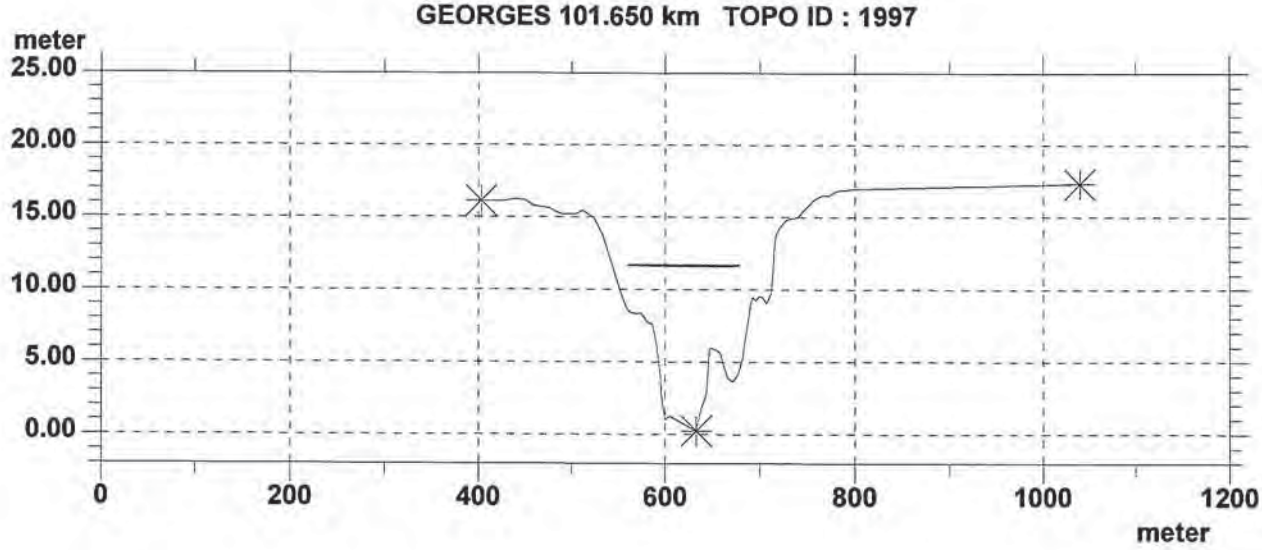

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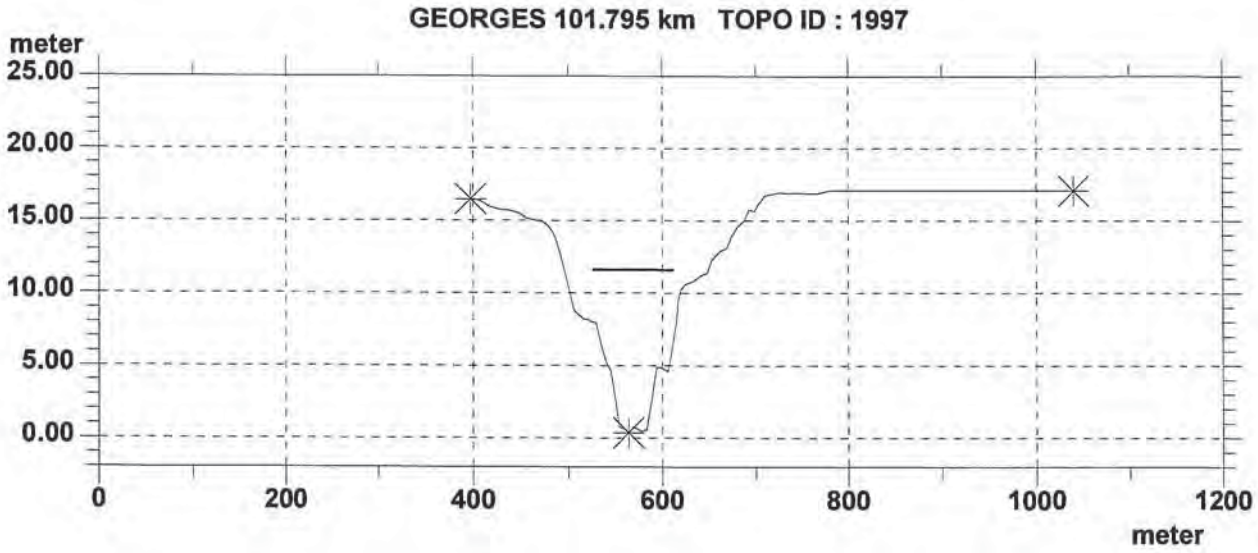
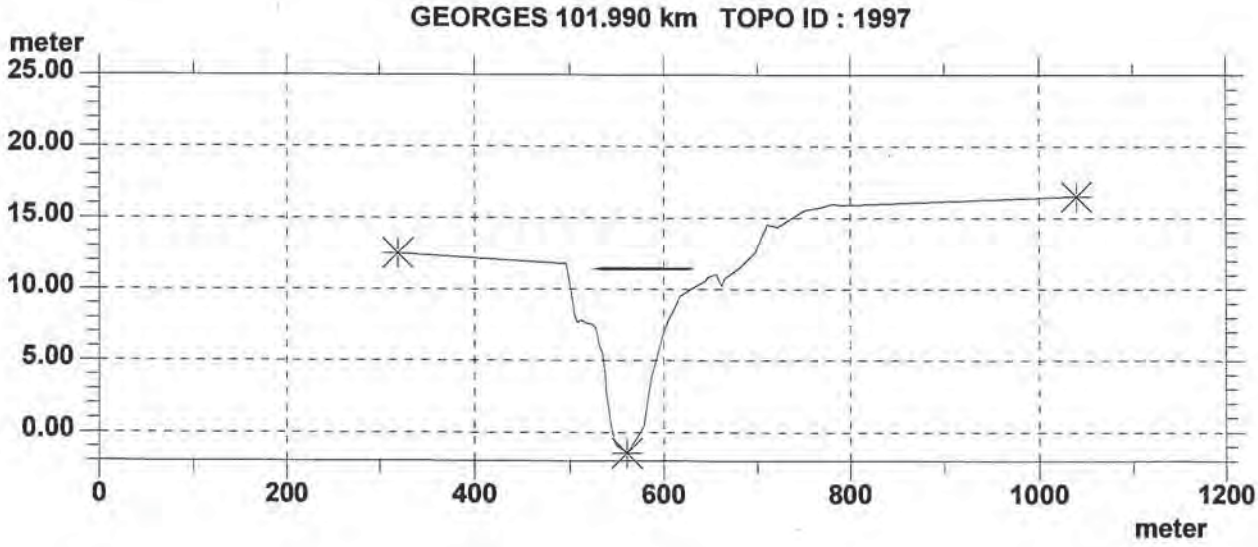
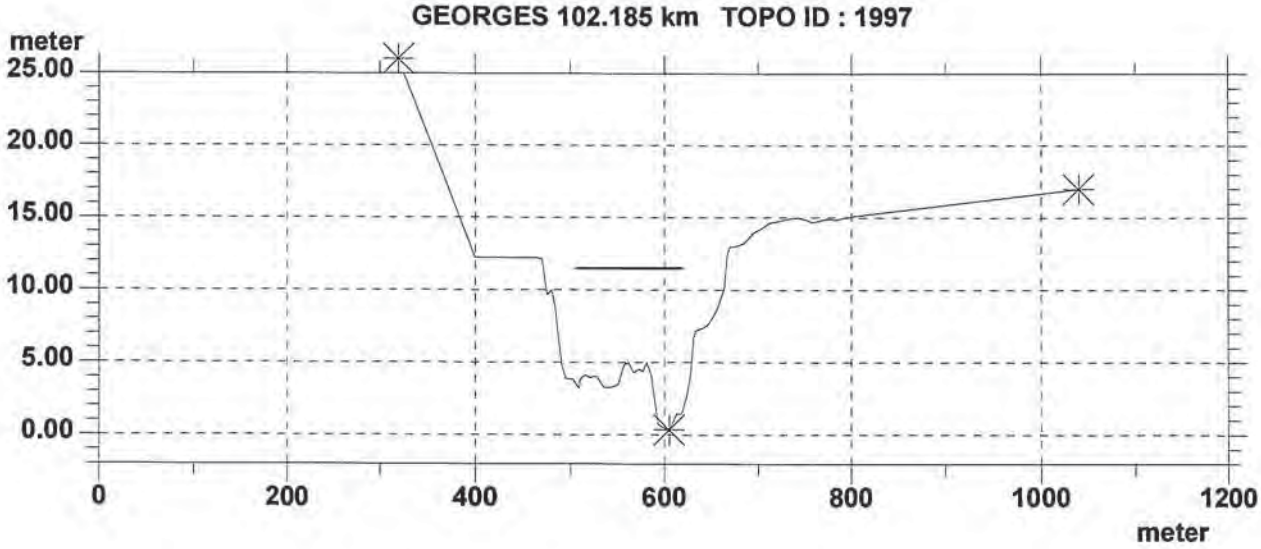
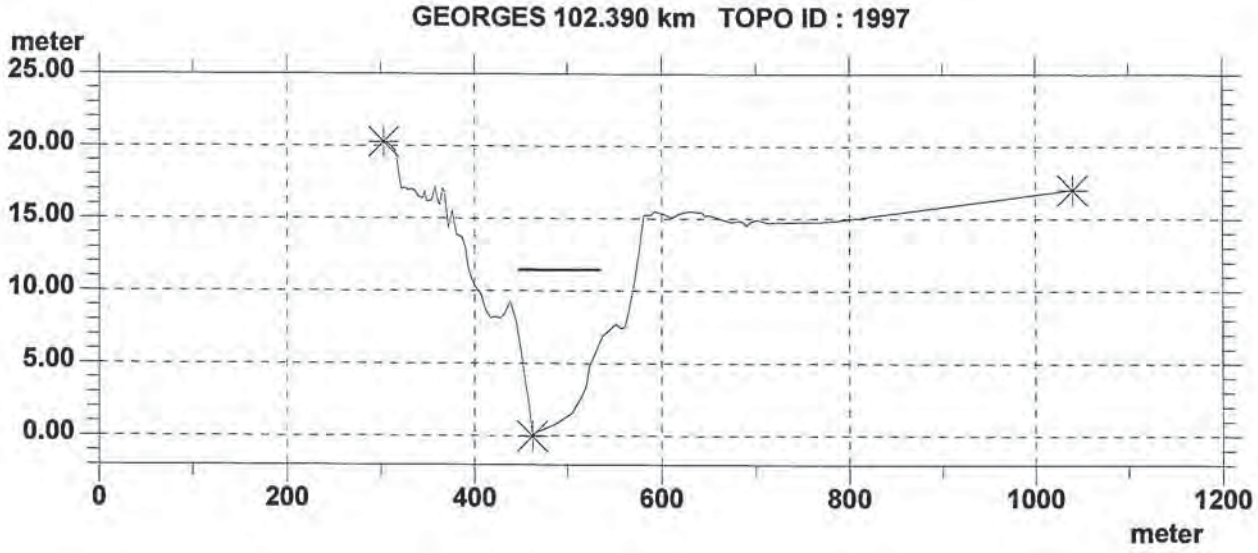
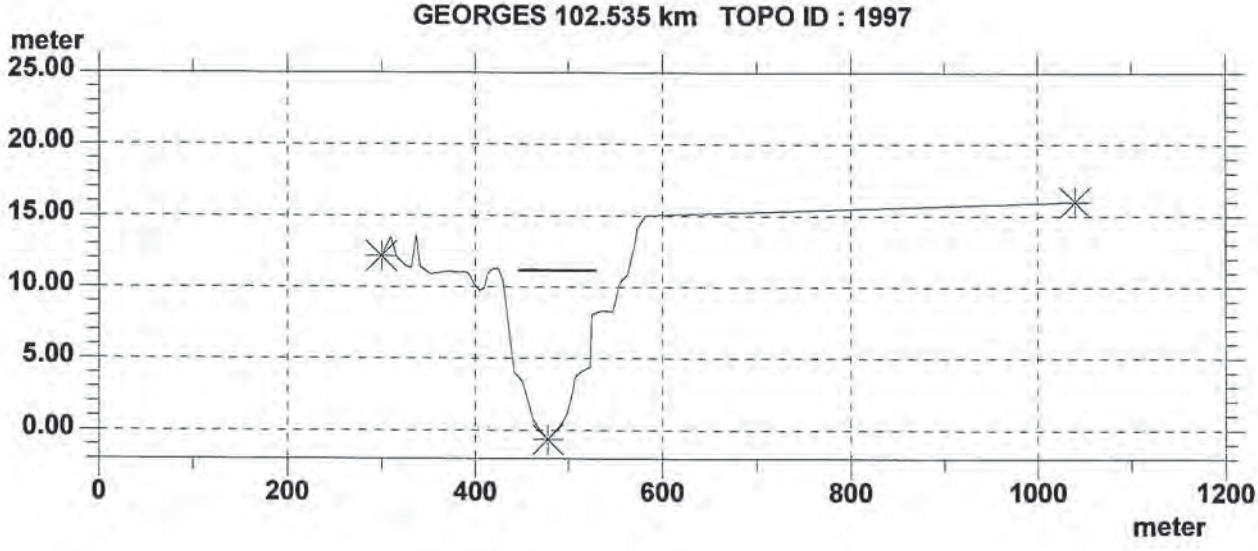


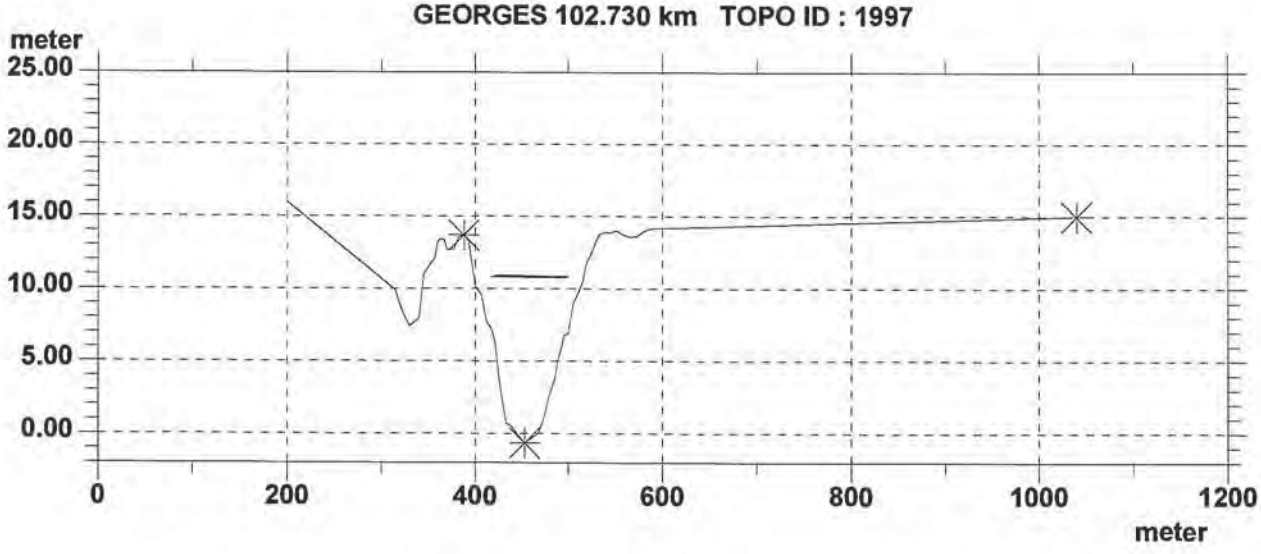




	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

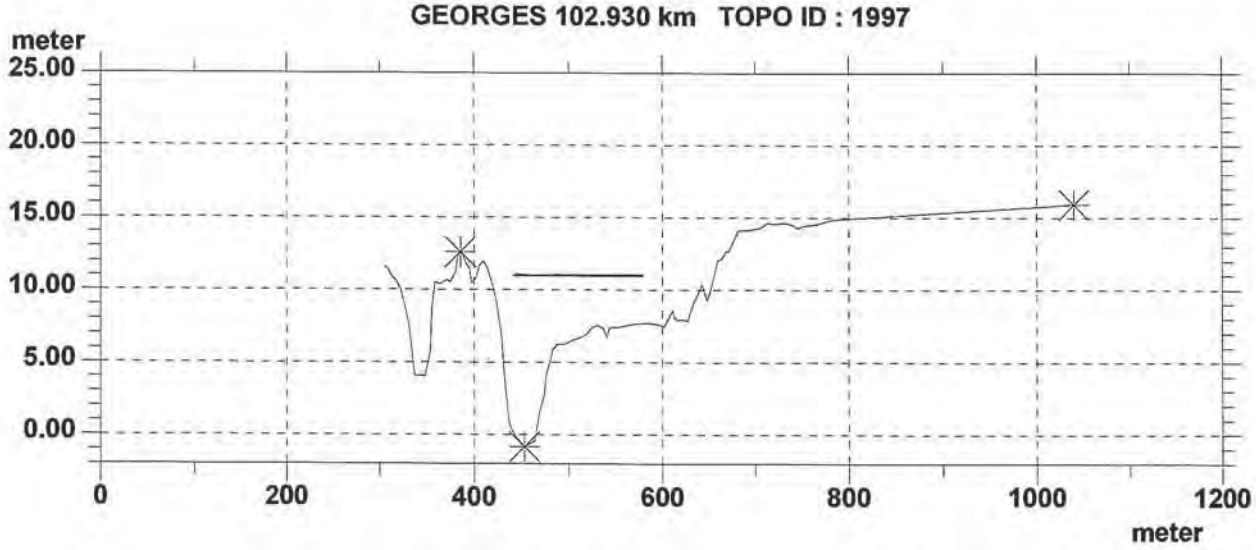






	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

GEORGES 102.930 km TOPO ID : 1997



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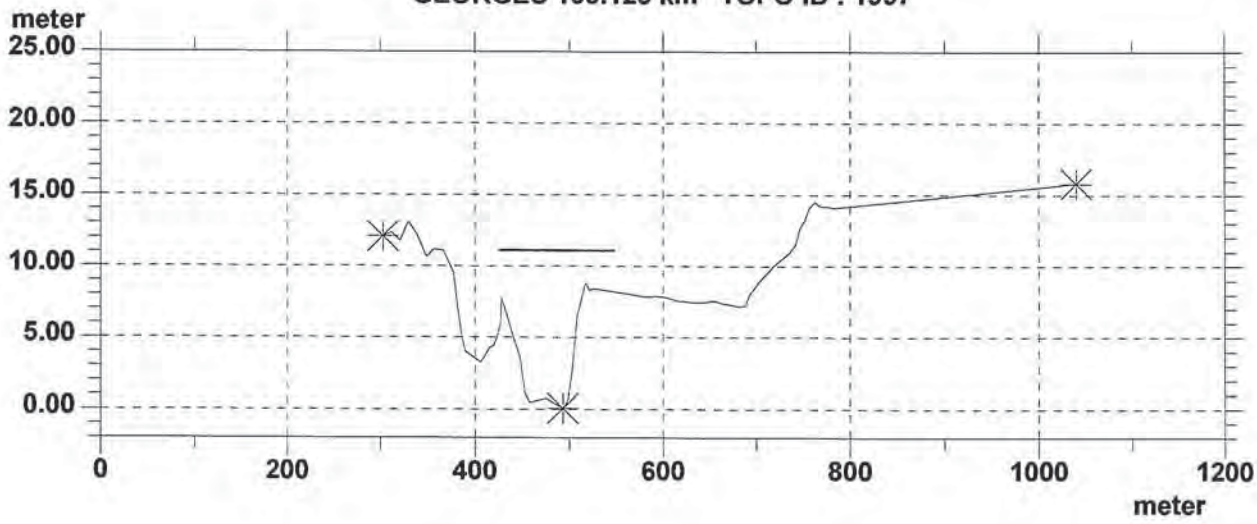

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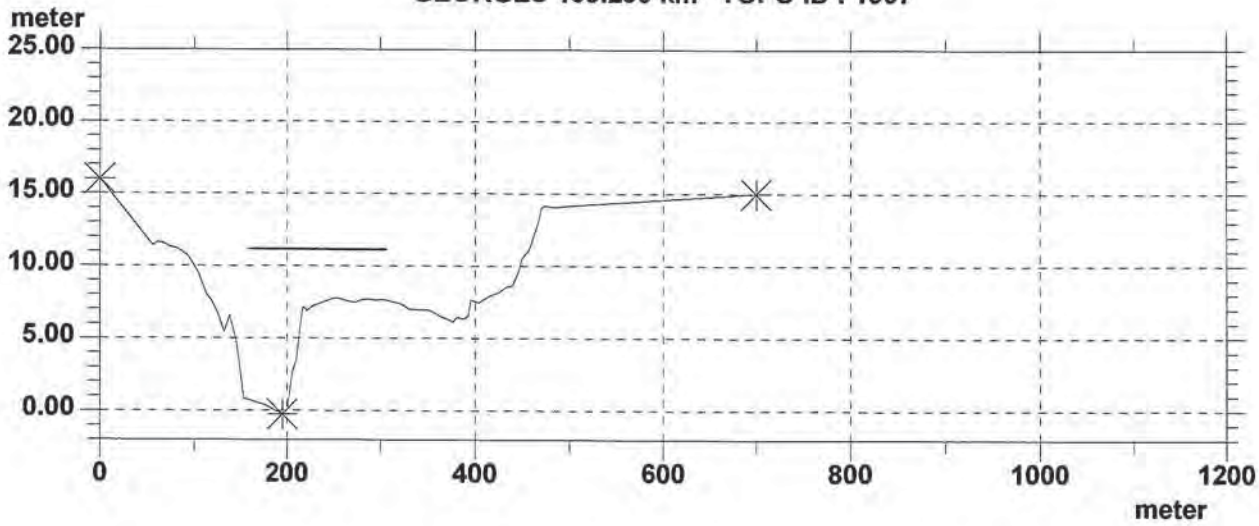
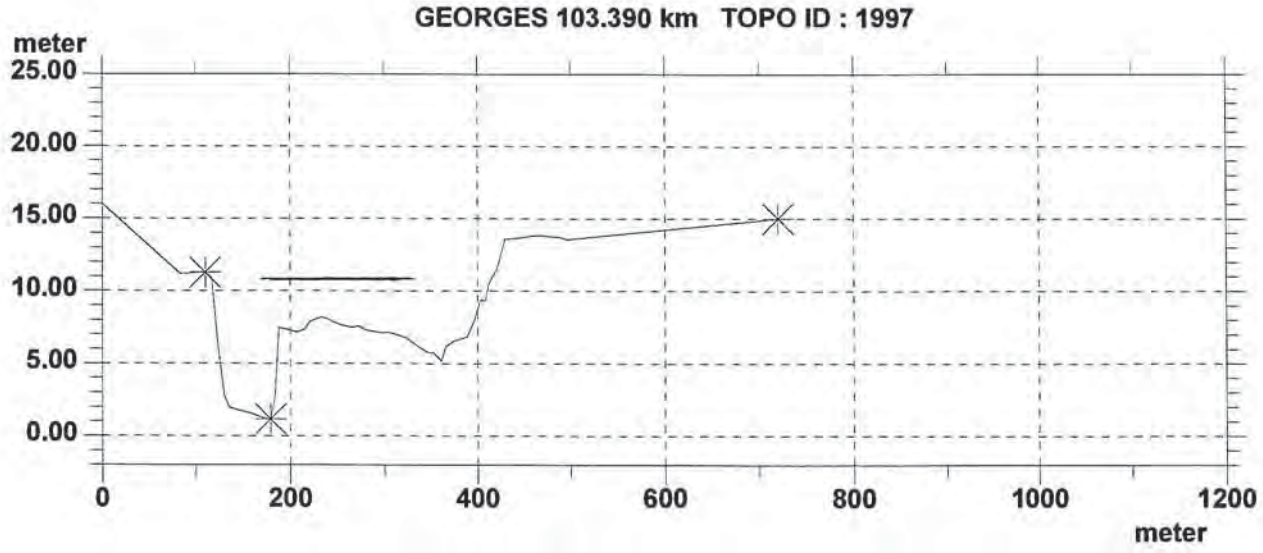
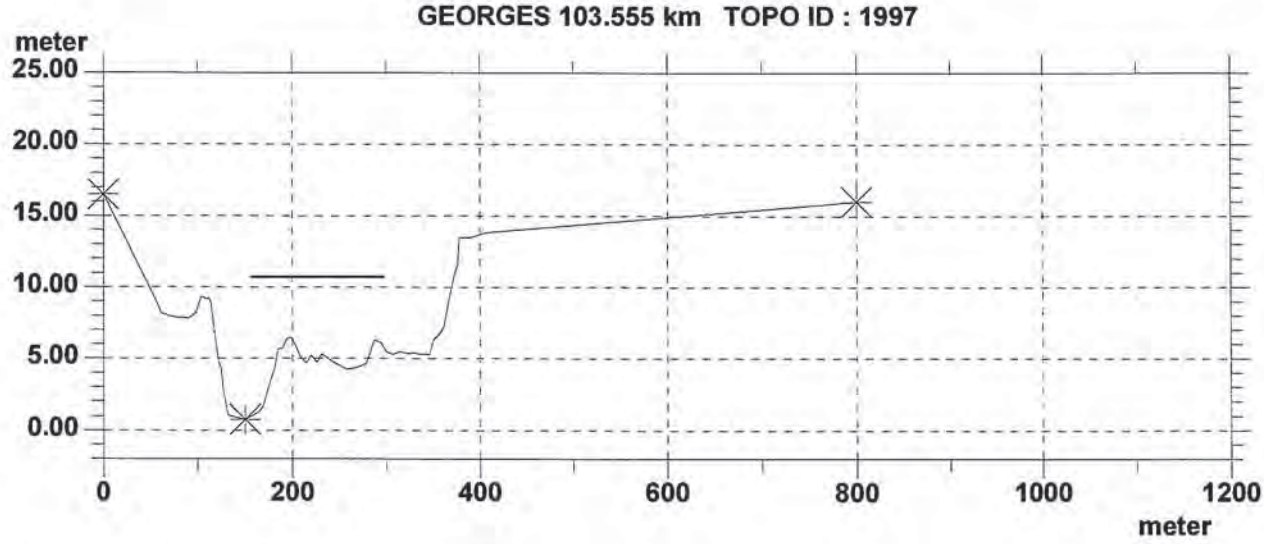
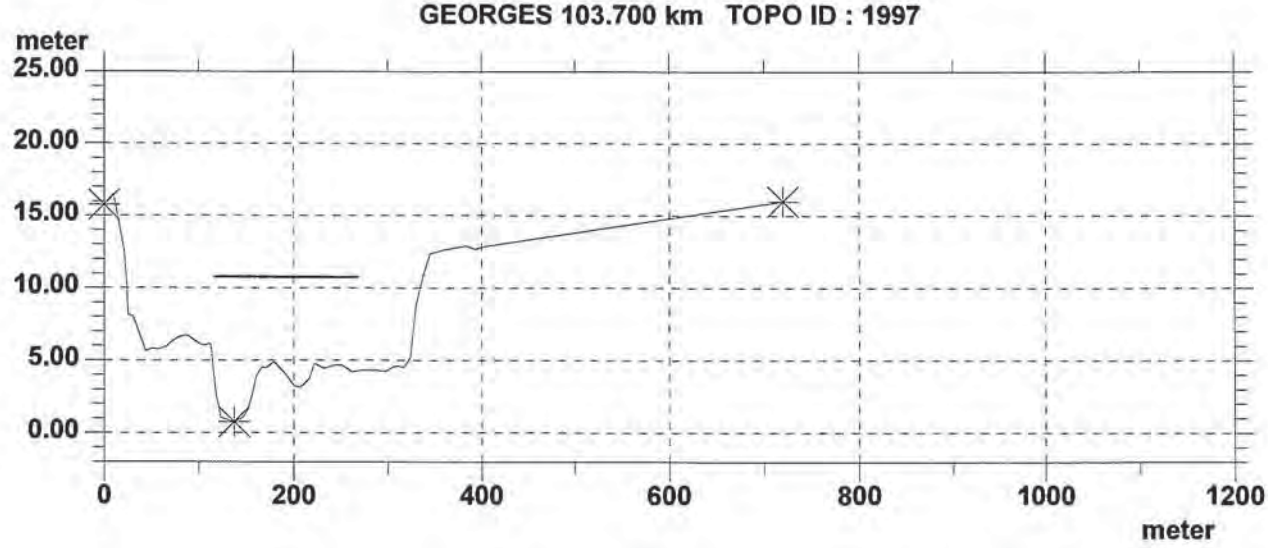


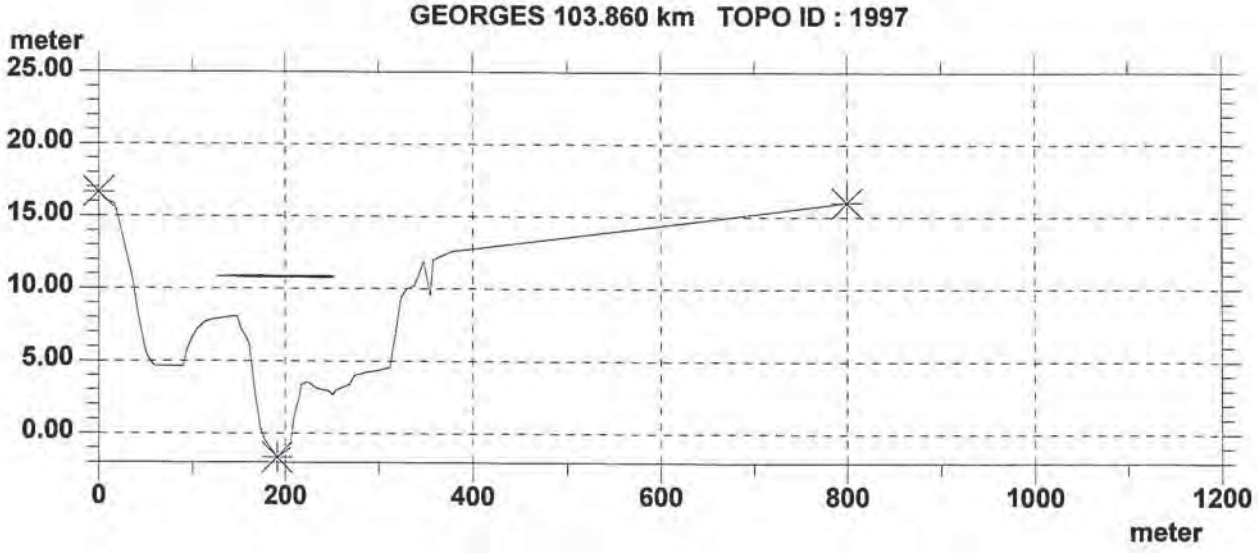
	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

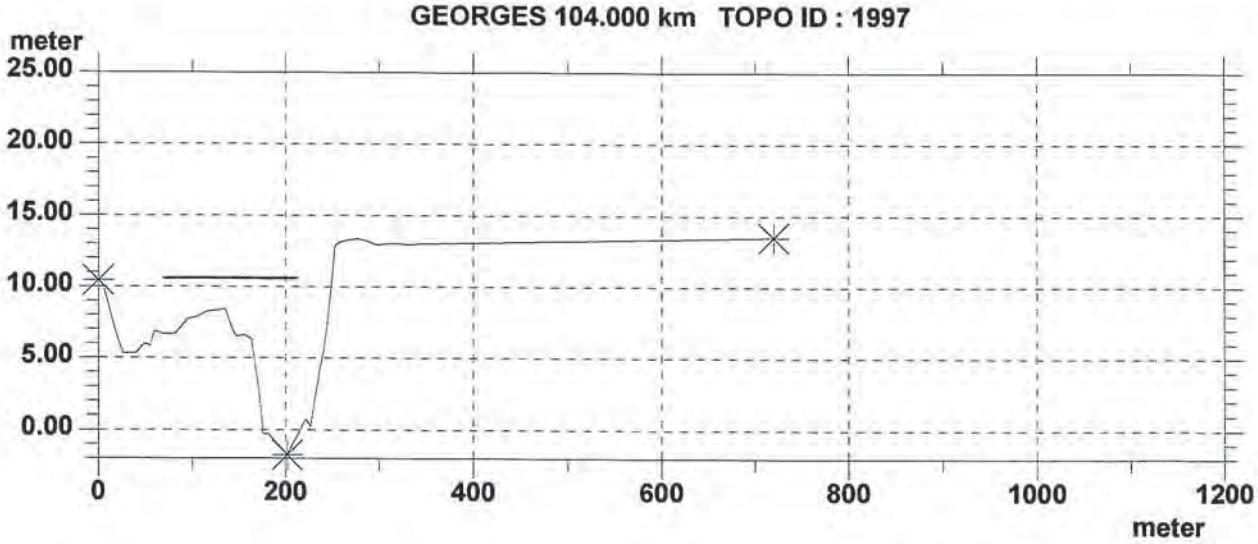


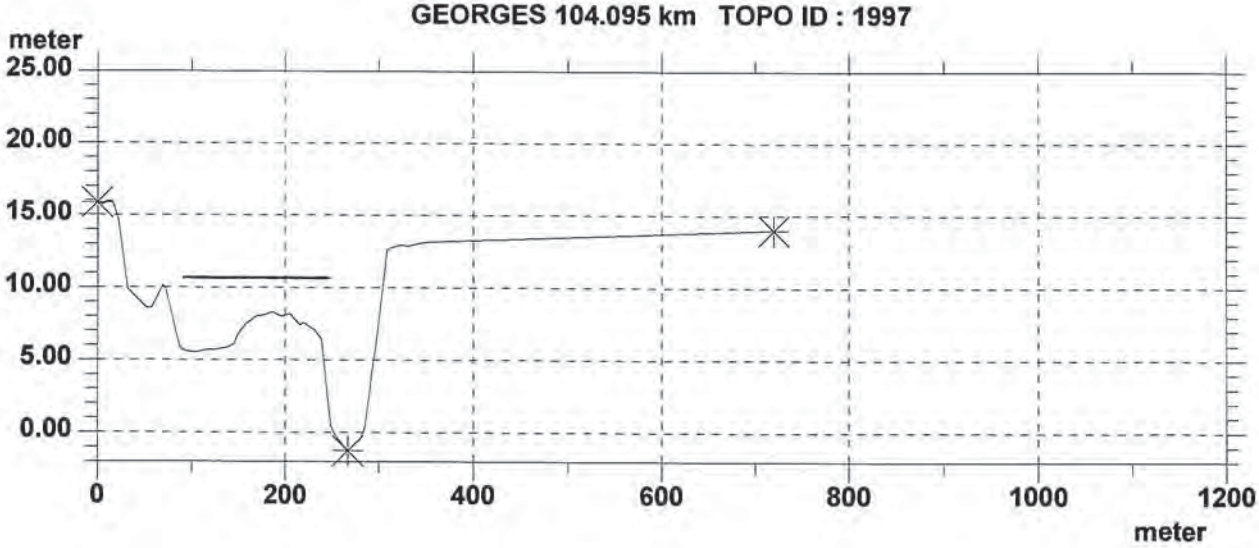




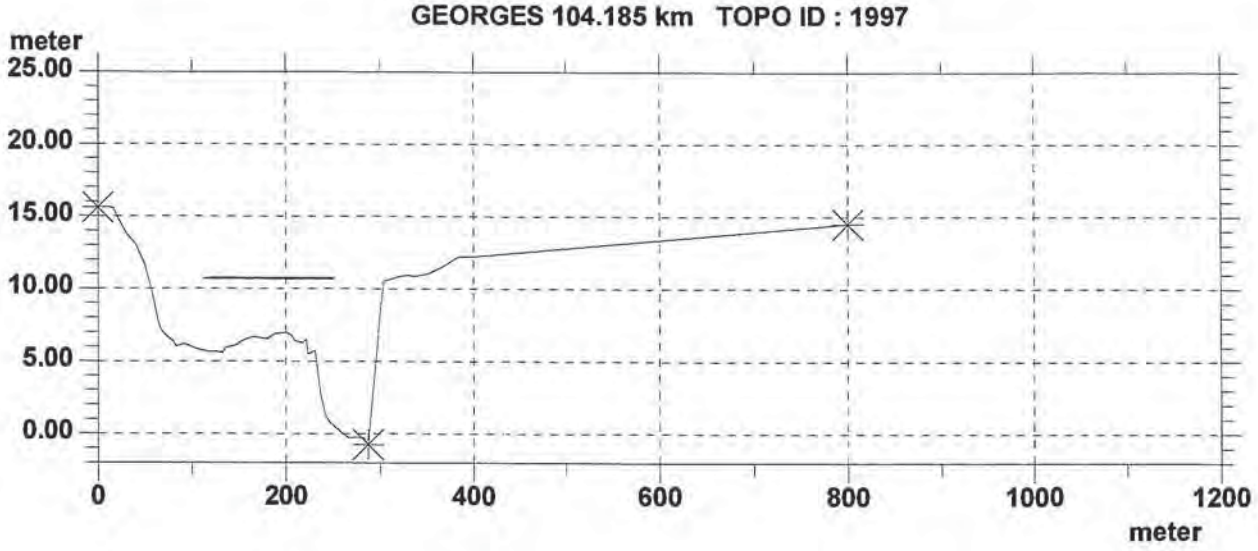
	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

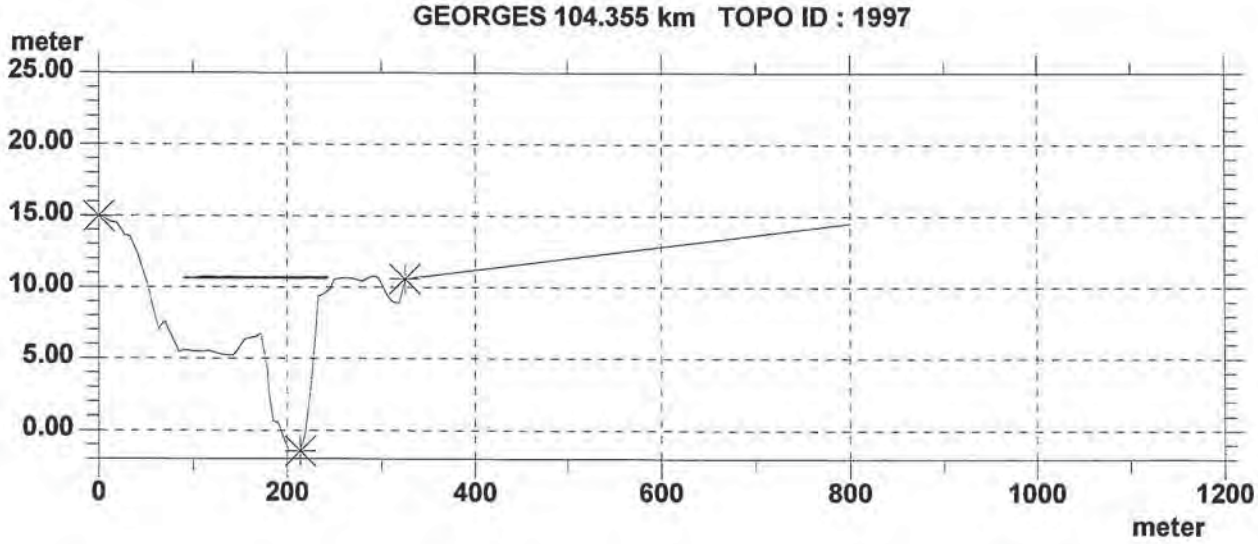


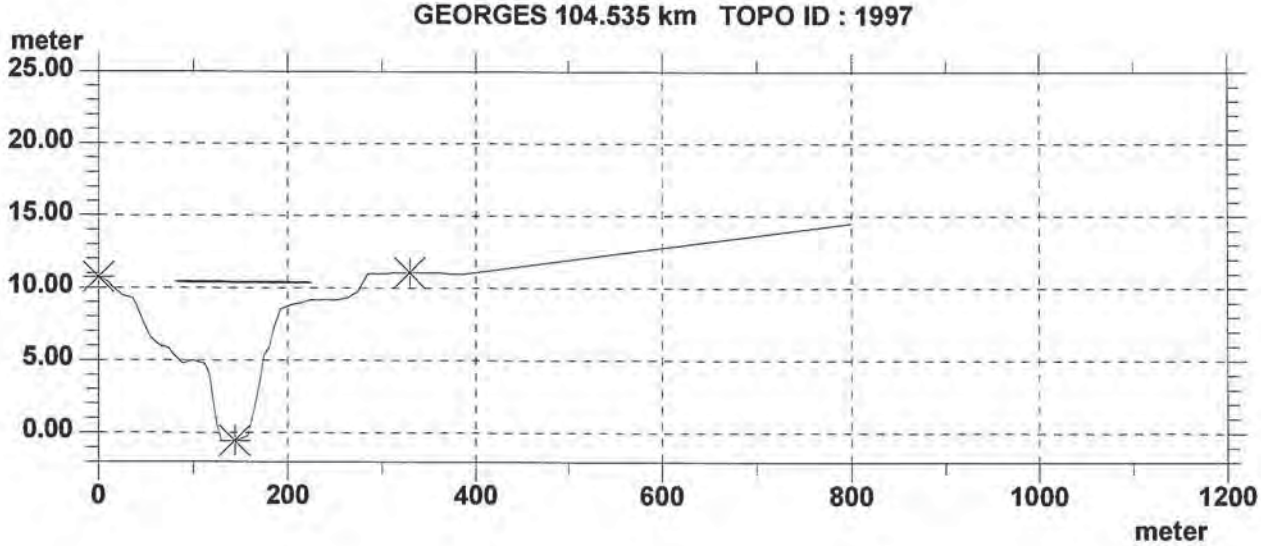




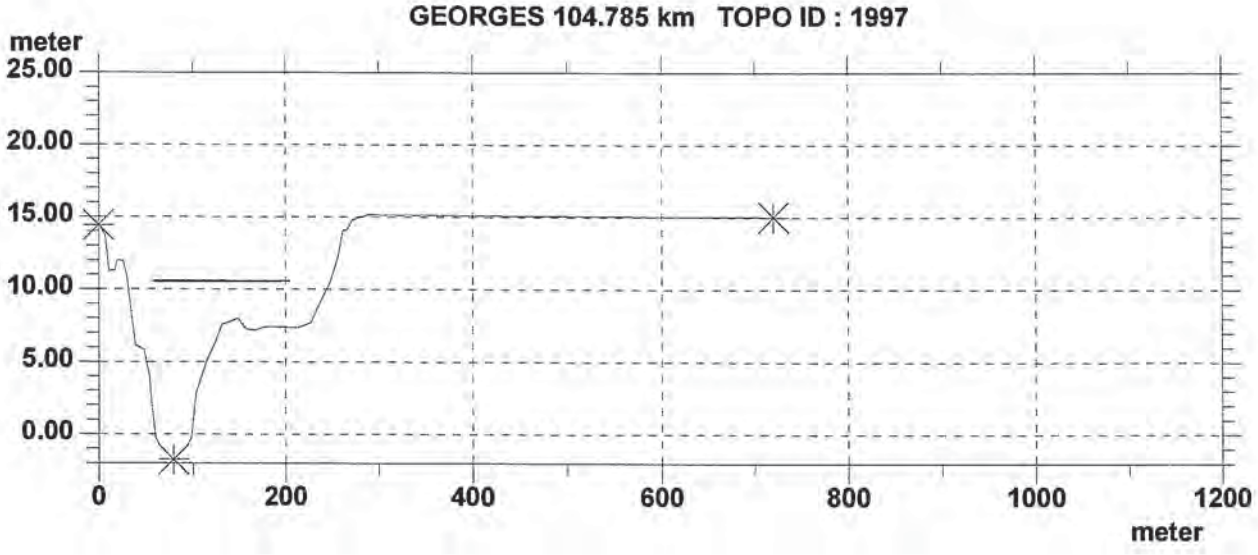
	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

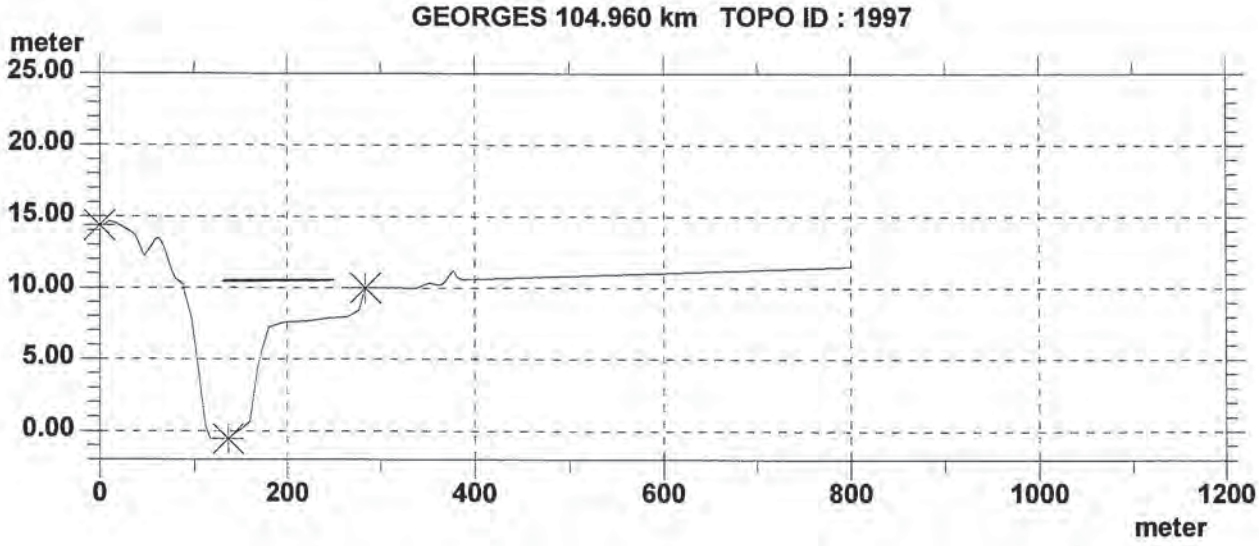


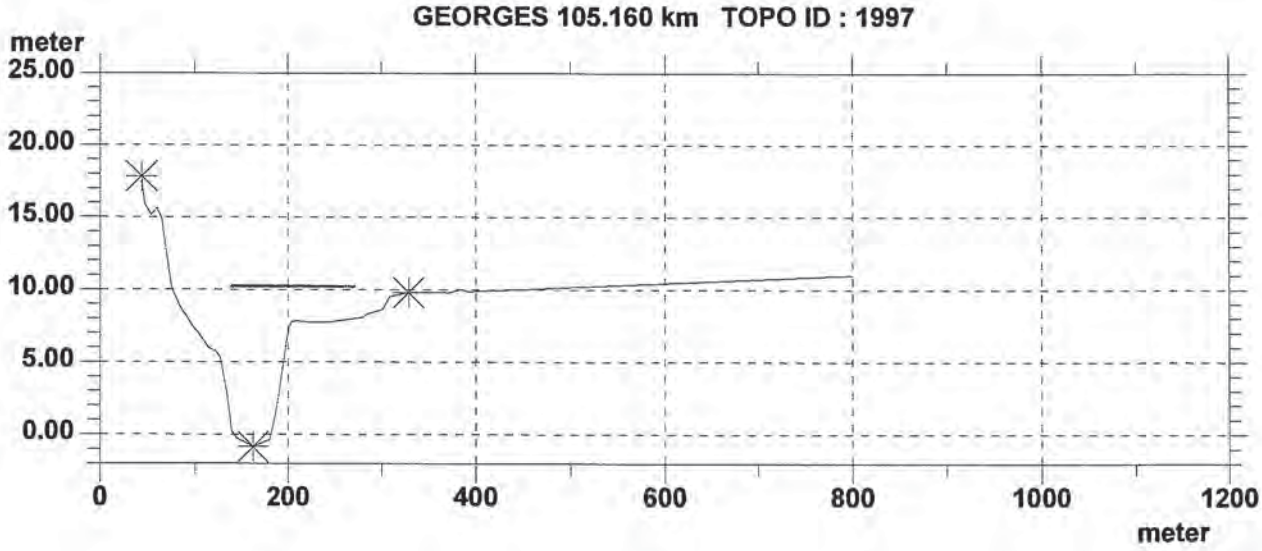




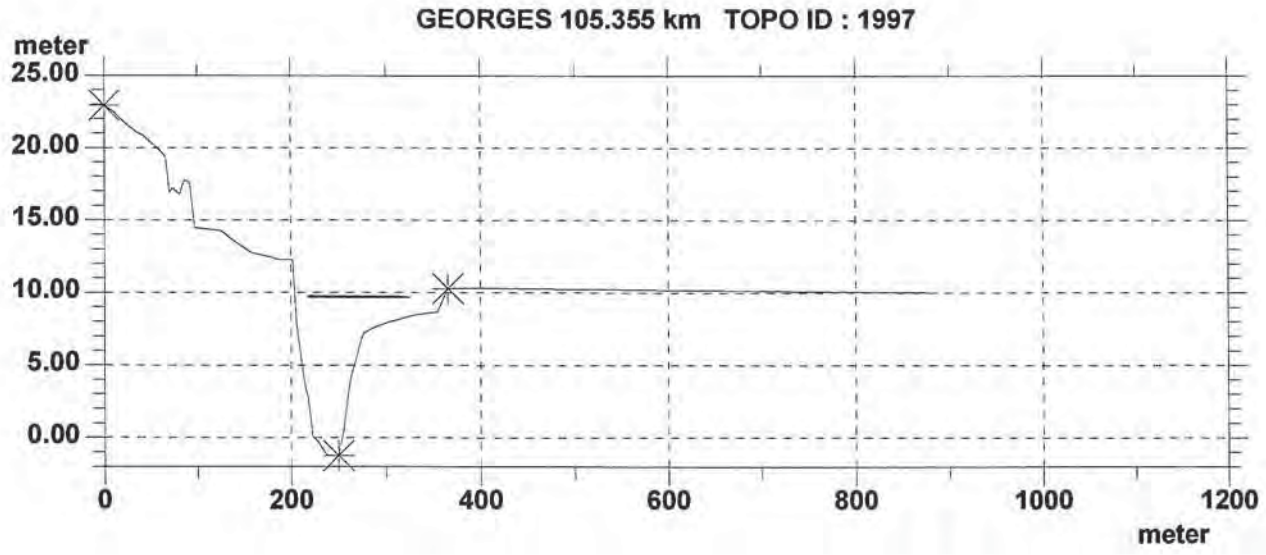
	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

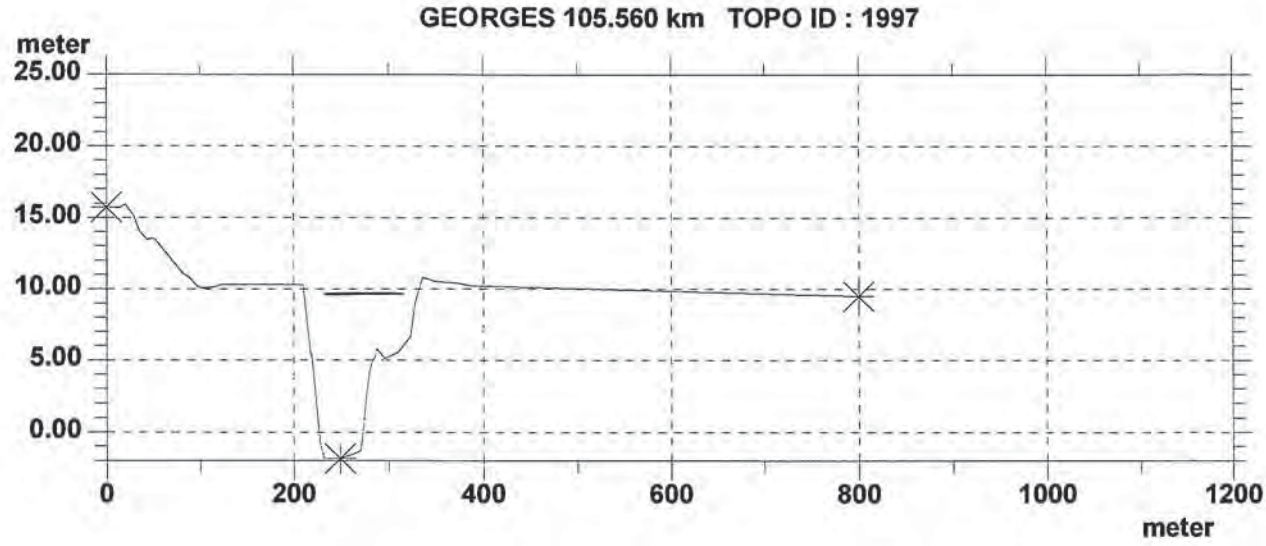


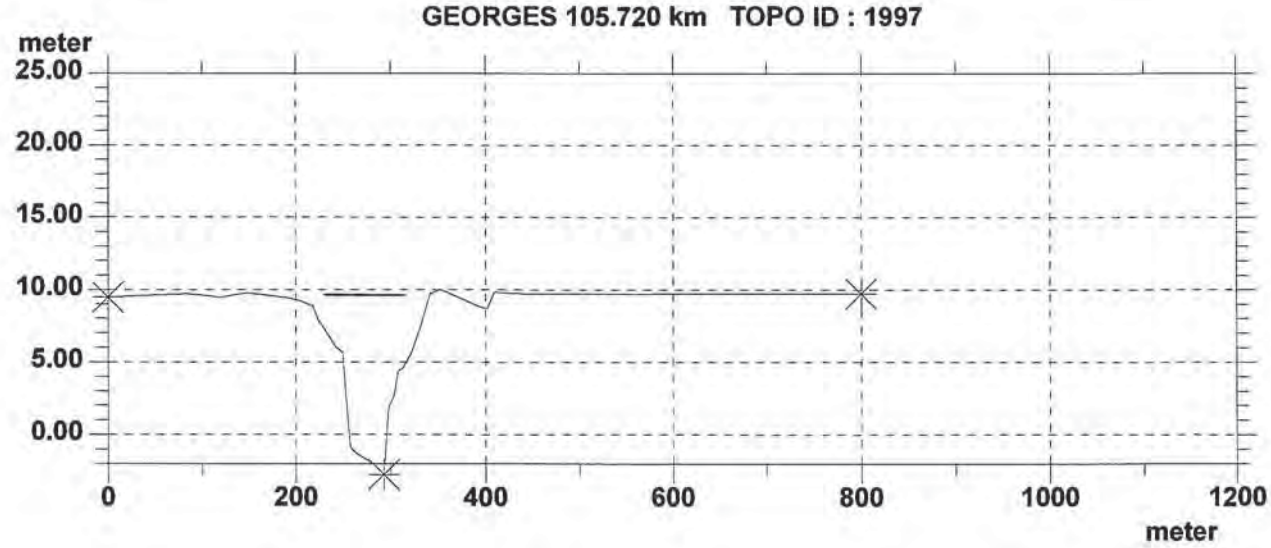




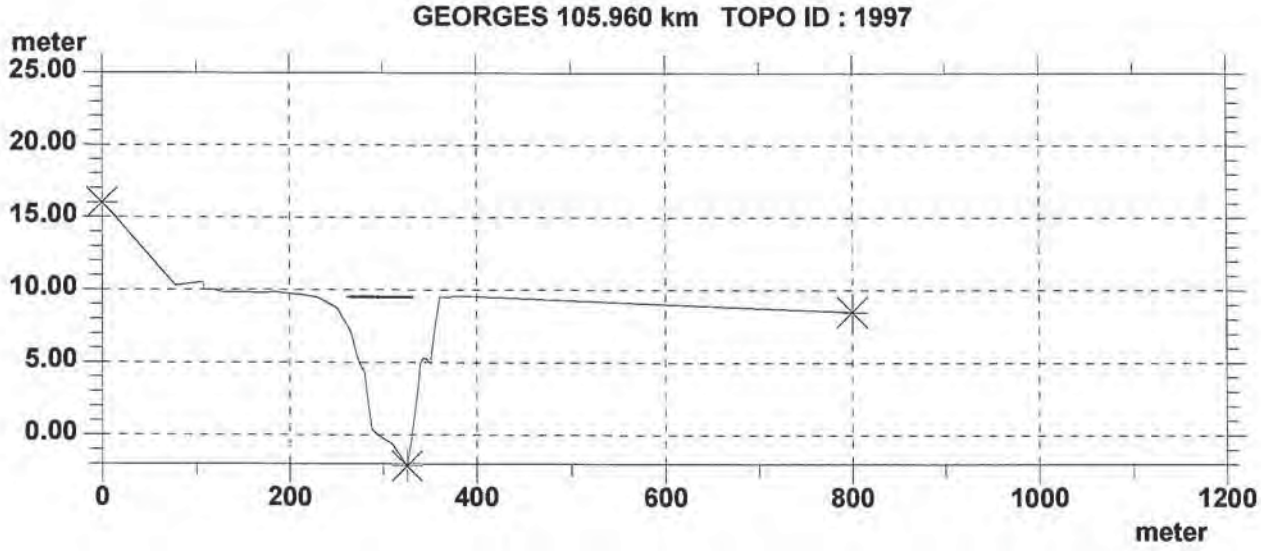
	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

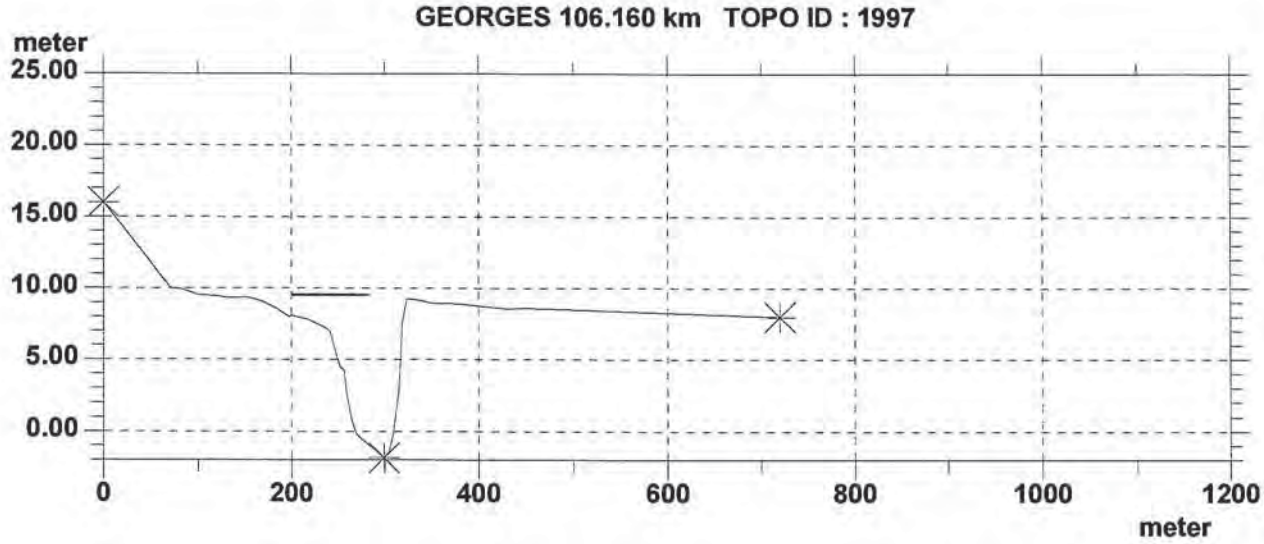


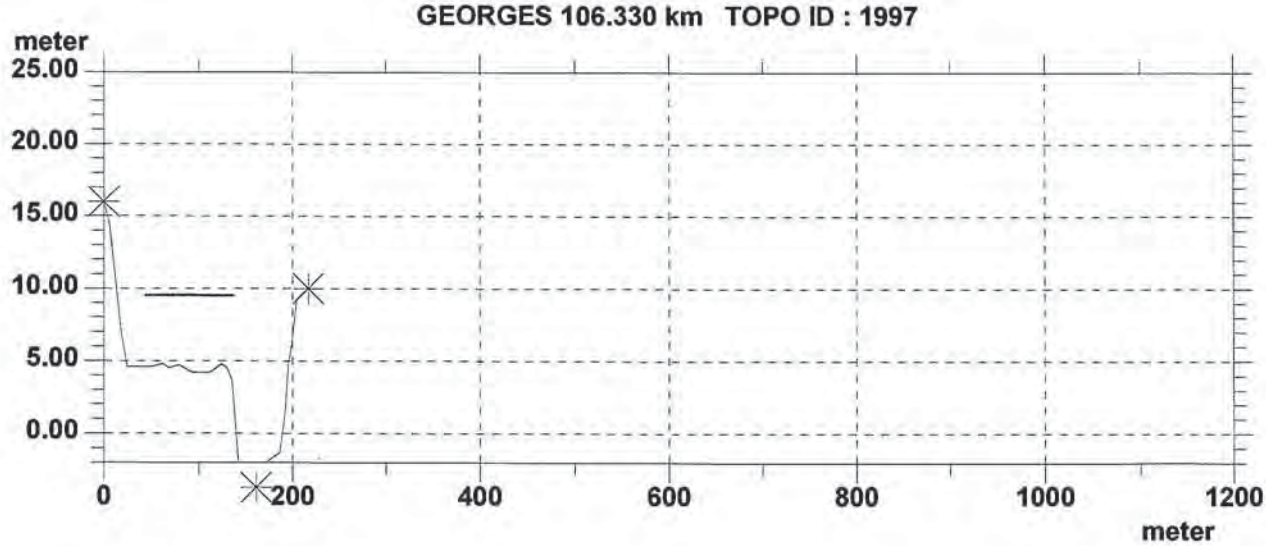




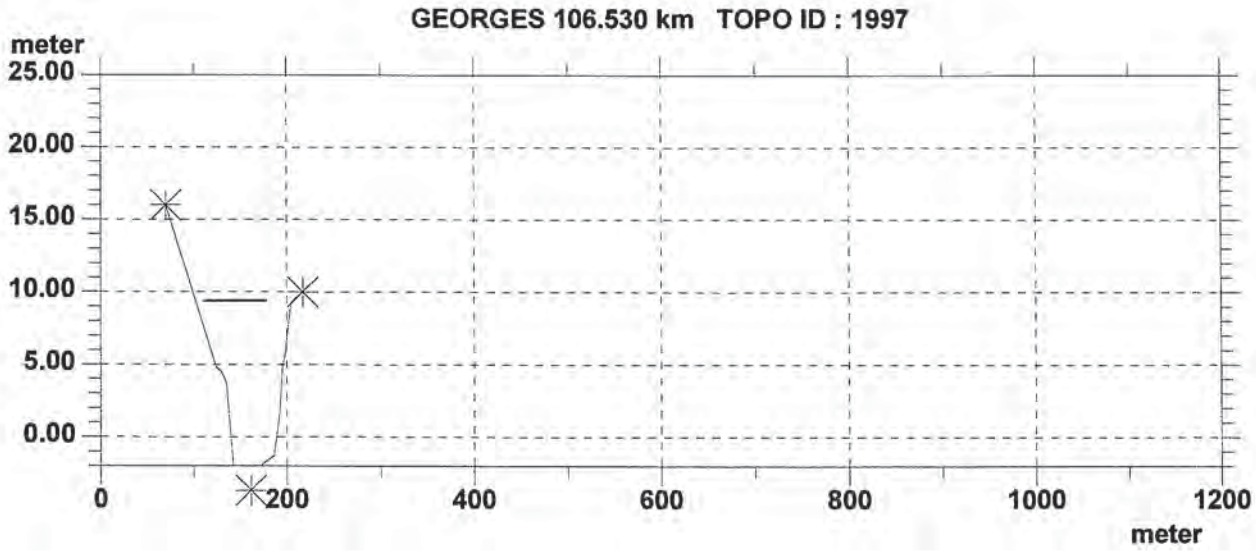
	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11





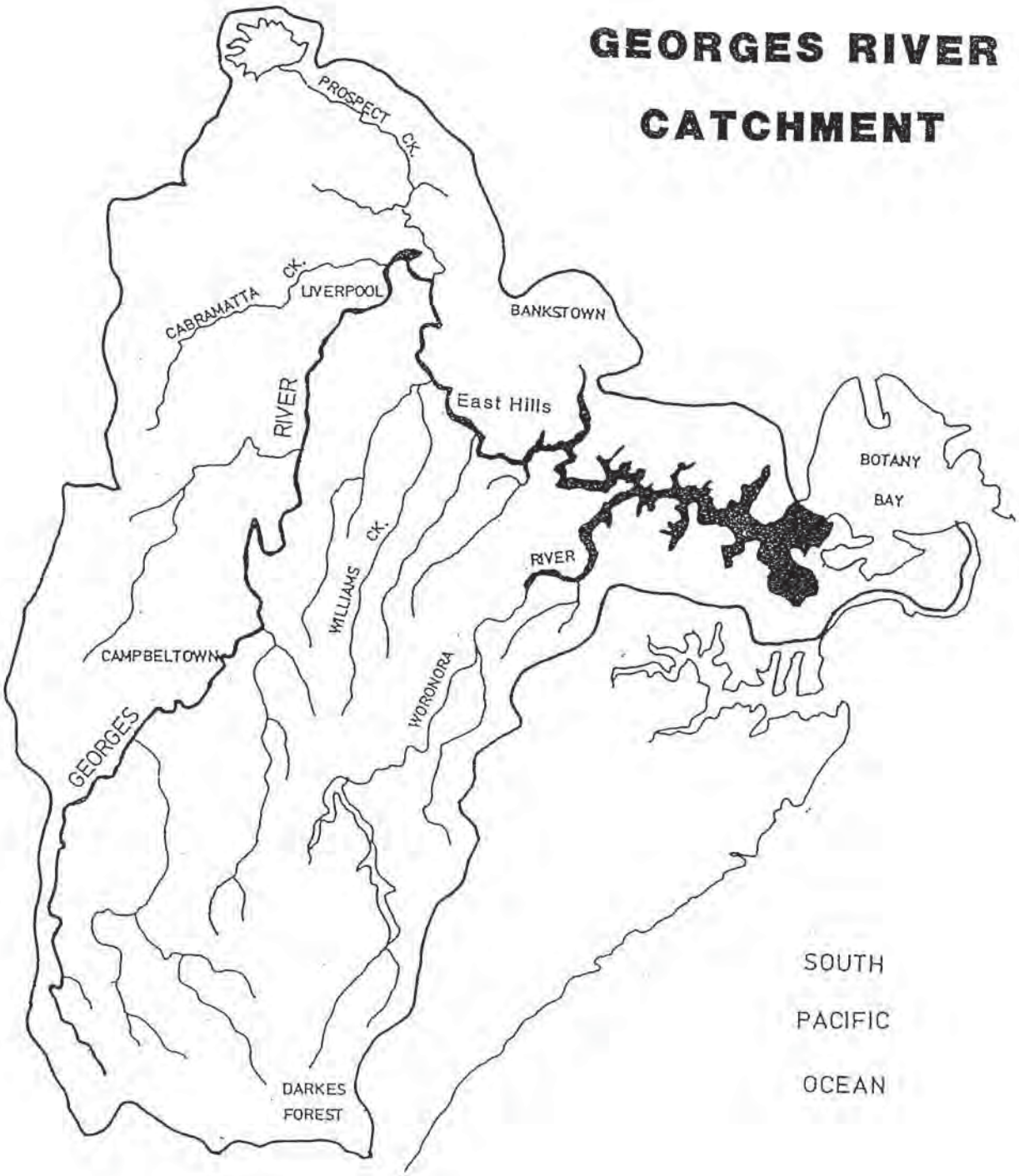


	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11



	Upper Georges River Flood Study Model Cross Sections
DATA BASE : GEORGES	MIKE 11

FIGURES



Georges River Catchment Plan

Figure 1

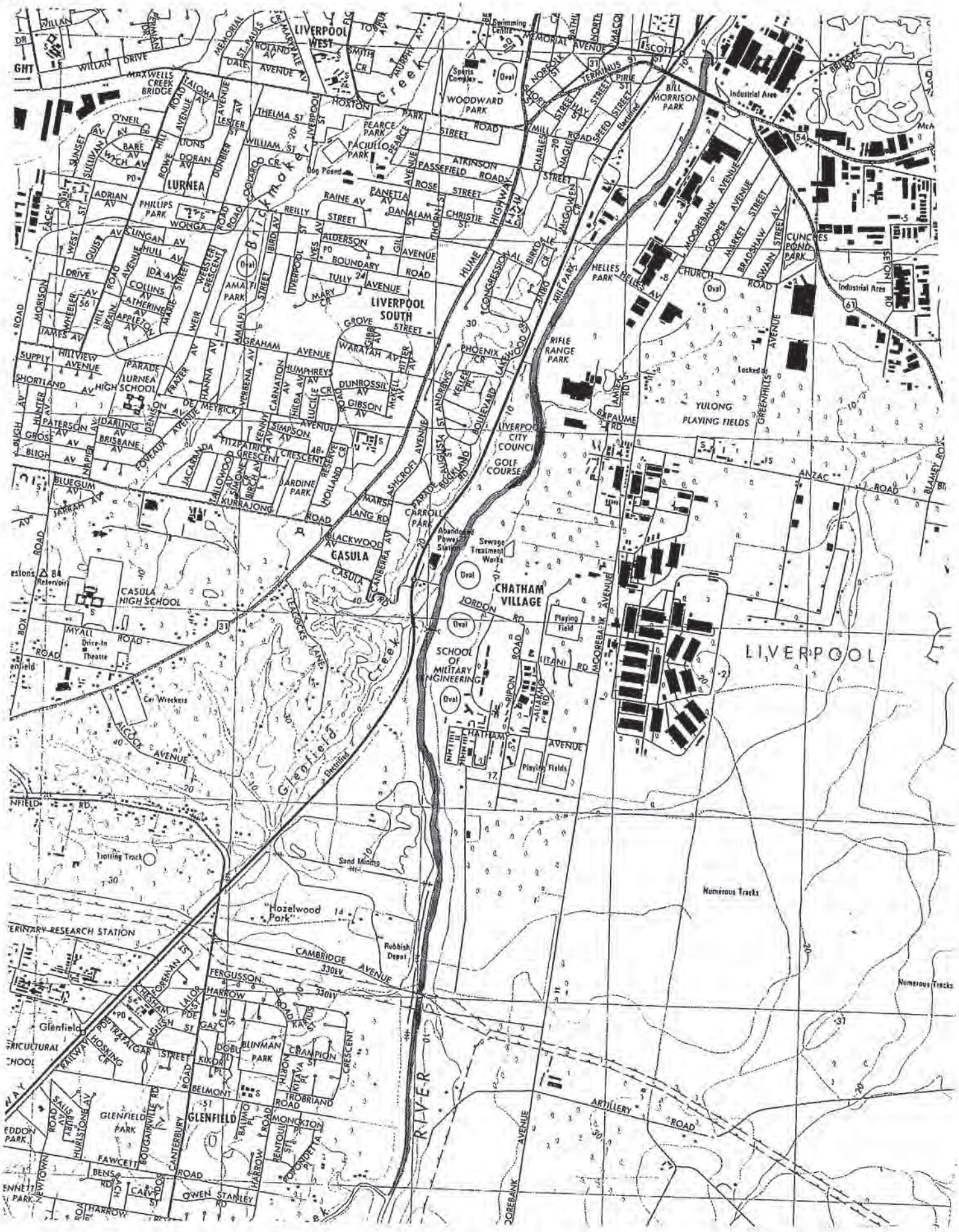
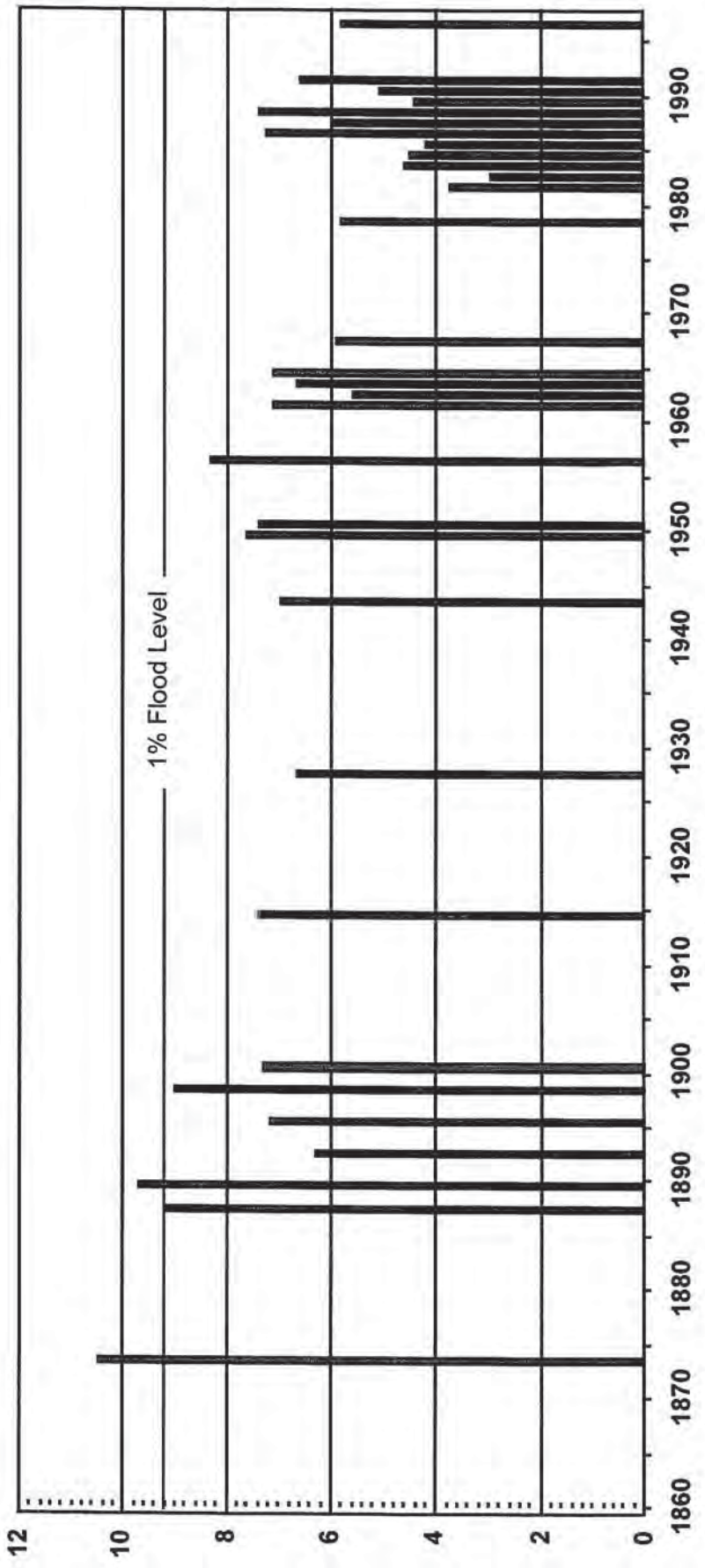

LIVERPOOL WEST
LIVERPOOL SOUTH
LURNEA
CASULA
CHATHAM VILLAGE
LIVERPOOL
GLENFIELD
Brickmaker Creek
Glenfield Creek
RIVER
Study Area

Figure 2



Historical Flood Data at Liverpool

Figure 3

WBNM Model Representation
of the Upper Georges River

Figure 4

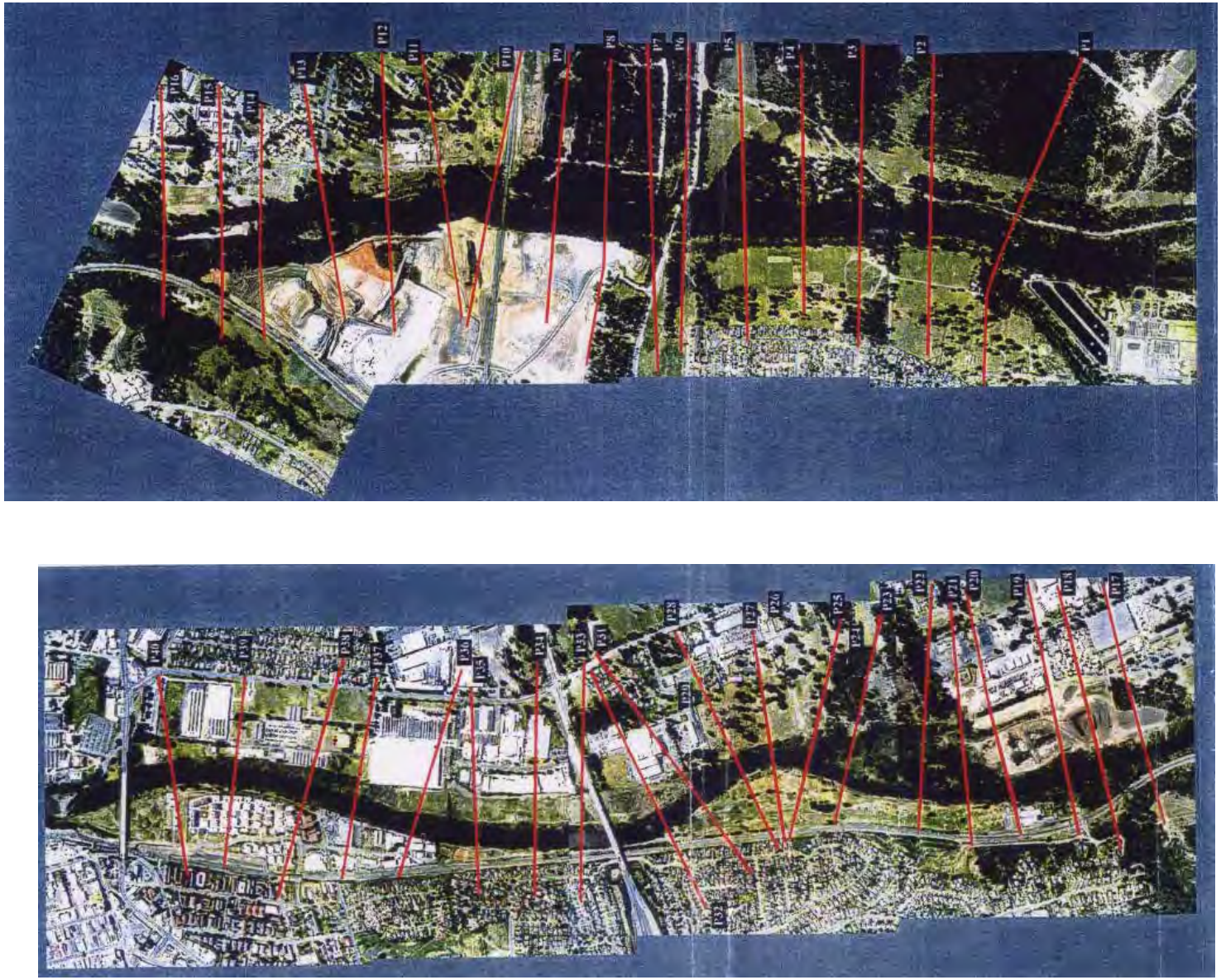
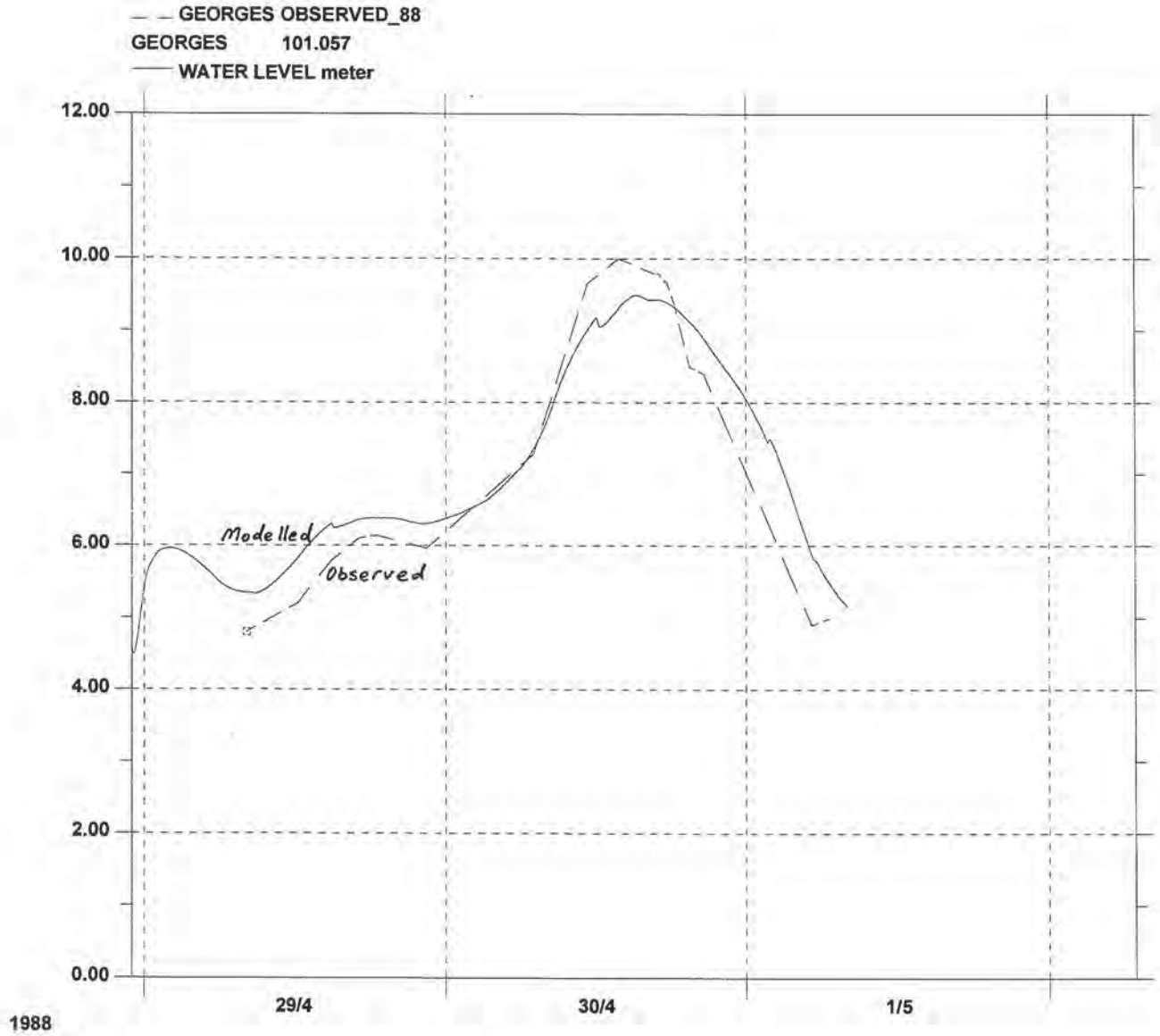


Figure 5
Location of Model Cross Sections

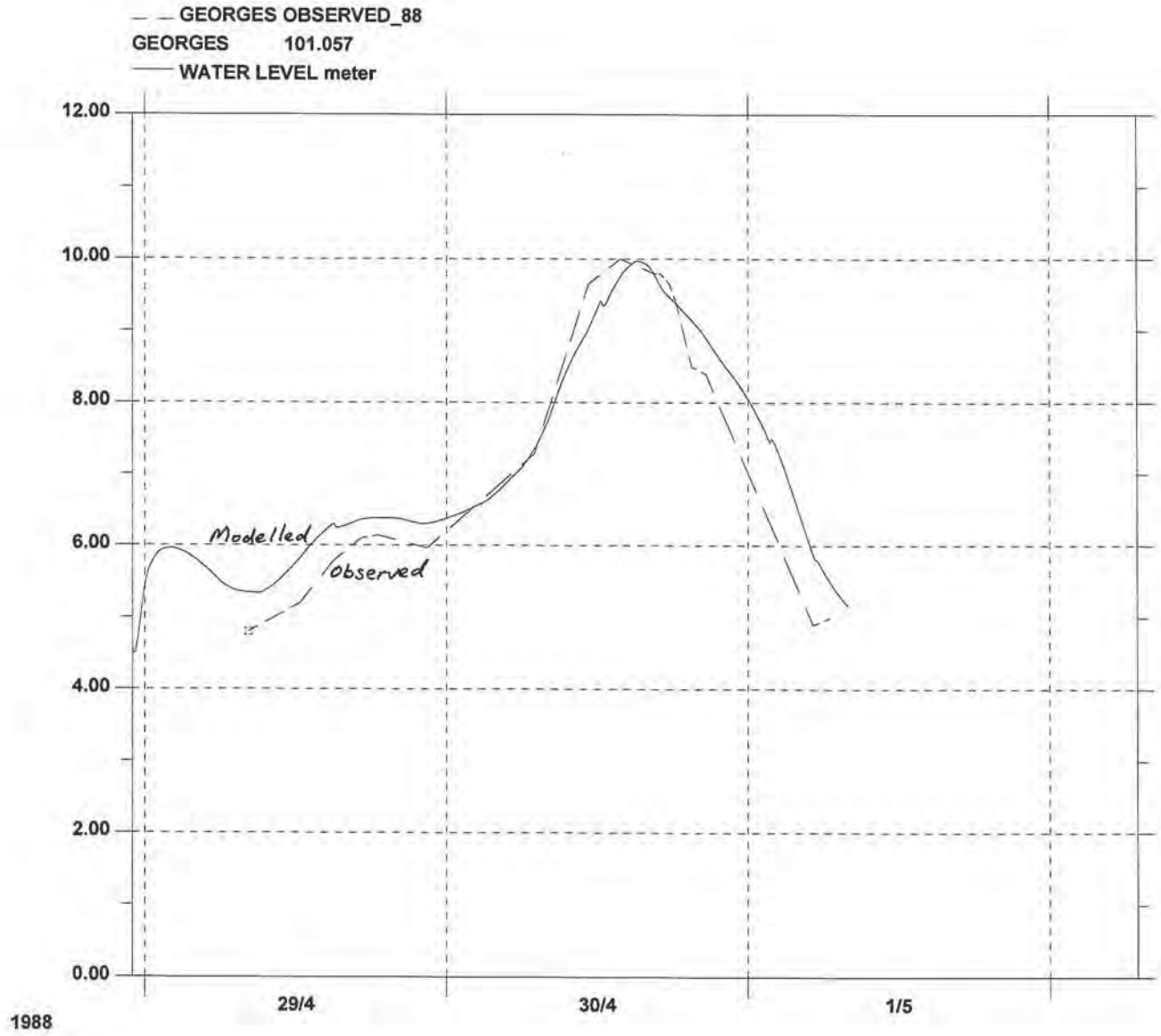
LIVERPOOL WEIR RATING CURVE

Liverpool Weir Rating Curve

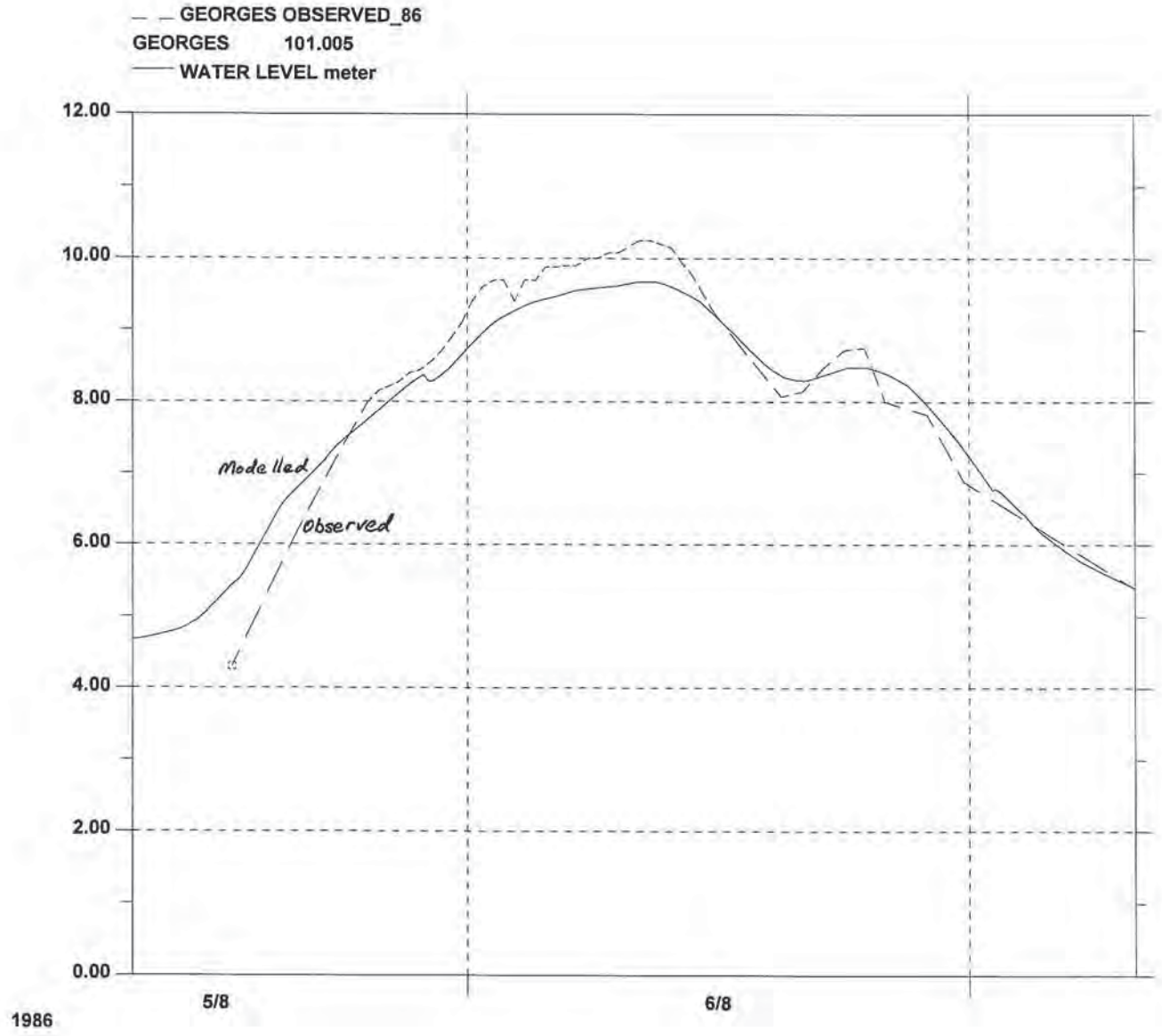
Figure 6



	Calibration at Cambridge Ave **April 1988 Flood Event** **(Flows from Georges River Flood Study, 1991)**
DATA FILE : GEORGES.RDF **RESULT FILE : GR_1988.RRF**	**BOUNDARY FILE : GR1988.BSF** **CALCULATED : 19-FEB-1998, 17:33**
MIKE 11	Figure 7



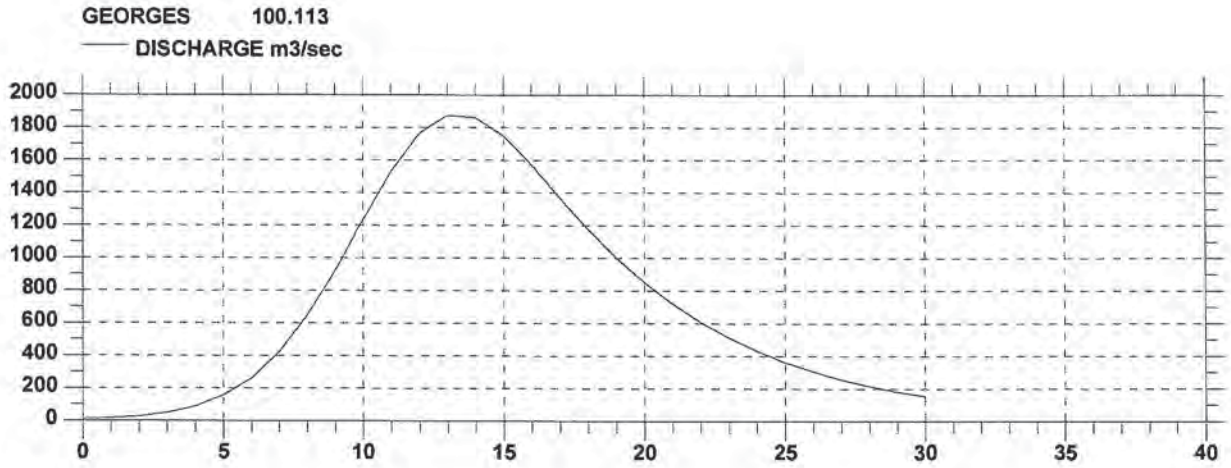
	Calibration at Cambridge Ave **April 1988 Flood Event** **(Flows increased by 15%)**
DATA FILE : GEORGES.RDF **RESULT FILE : GR_1988P.RRF**	**BOUNDARY FILE : GR1988PL.BSF** **CALCULATED : 20-FEB-1998, 16:03**
MIKE 11	
Figure 8	

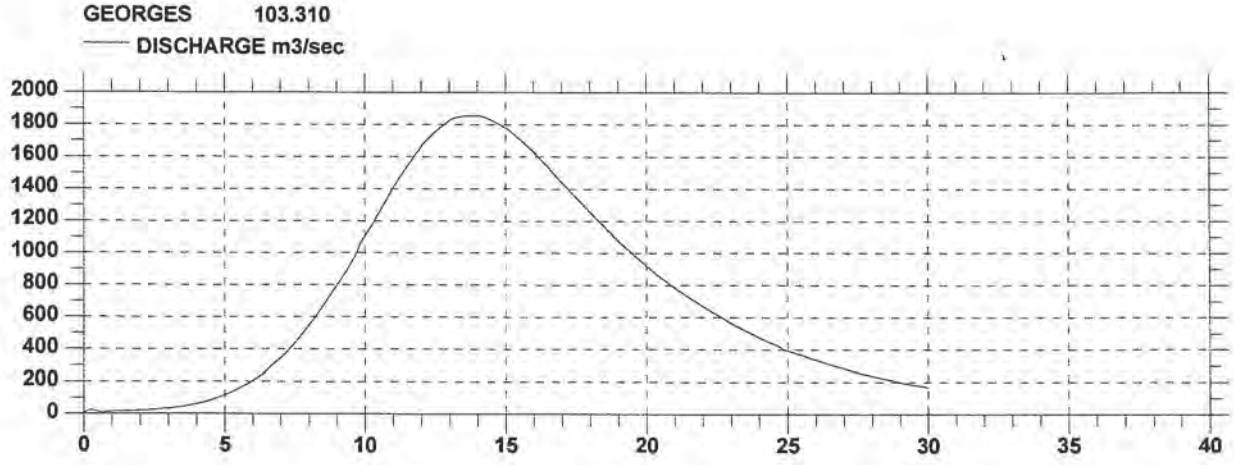


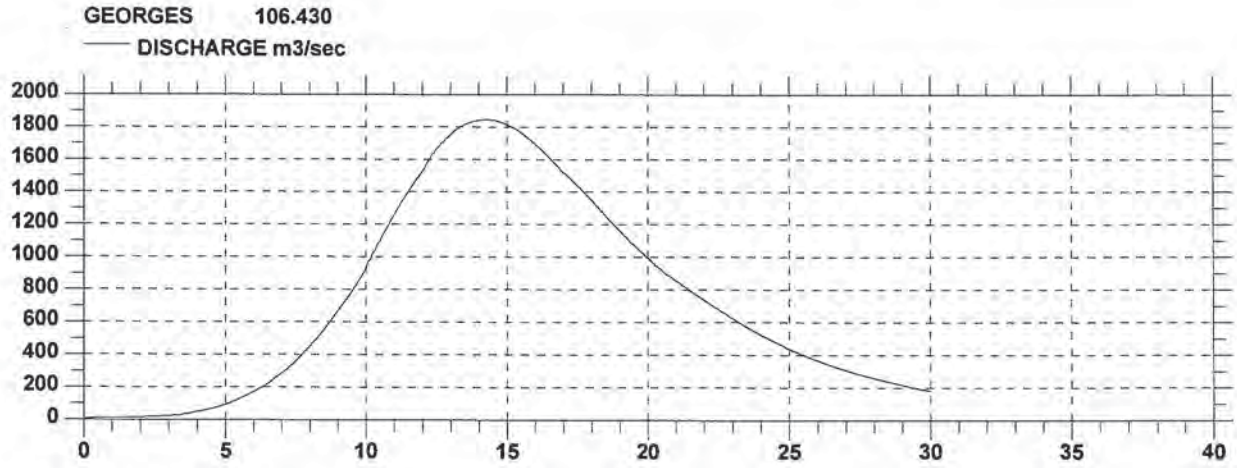
	Verification at Cambridge Ave **August 1986 Flood Event**
DATA FILE : GEORGE86.RDF **RESULT FILE : GR_1986.RRF** **BOUNDARY FILE : GR1986.BSF** **CALCULATED : 20-FEB-1998, 17:35**	**MIKE 11** Figure 9

Longitudinal Flood Profiles

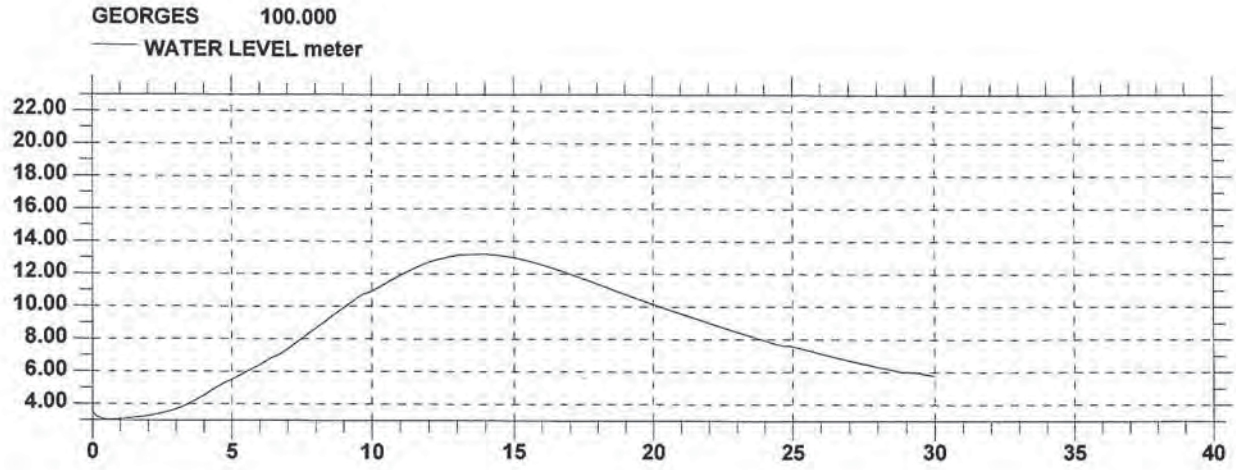
Figure 10

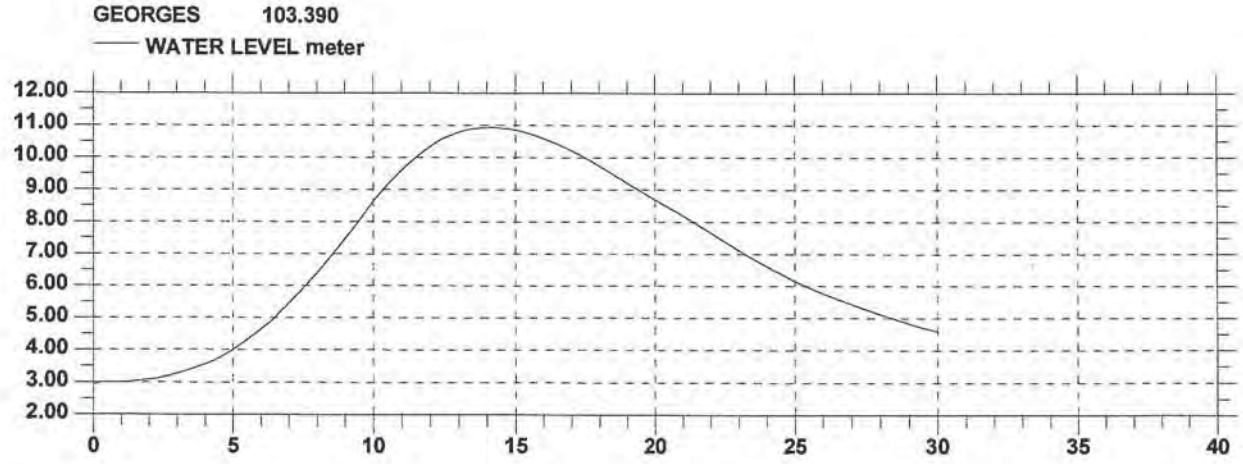


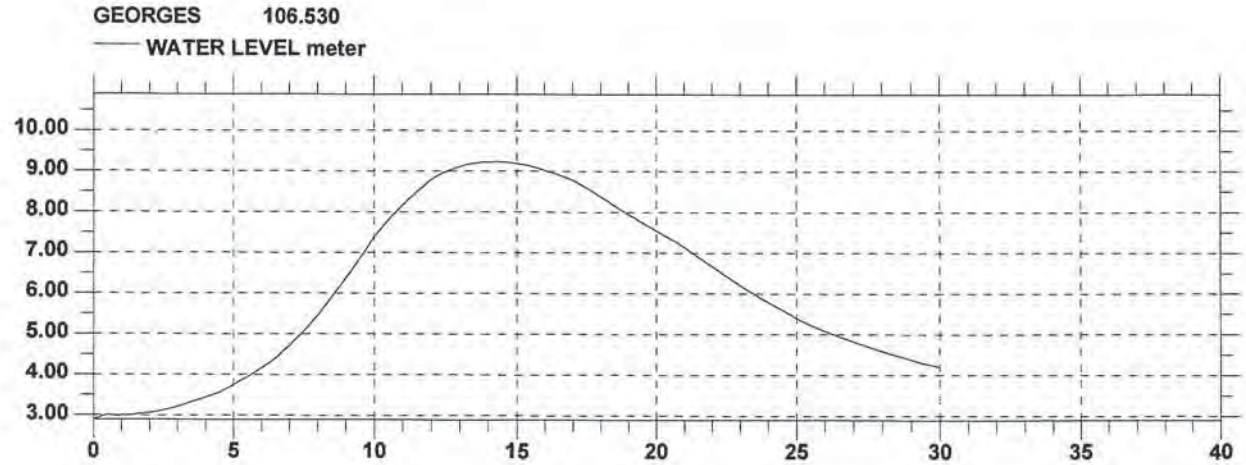




	Design Flow Hydrographs **1 in 100 year Design Storm** **Locations : U/S Boundary, Power Station, D/S Boundary**
DATA FILE : GEORGES.RDF **RESULT FILE : GR_100YR.RRF** **BOUNDARY FILE : GR_100YR.BSF** **CALCULATED : 23-FEB-1998, 11:58**	**MIKE 11** Figure 11







	Design Stage Hydrographs **1 in 100 year Design Storm** **Locations : U/S Boundary, Power Station, D/S Boundary**
DATA FILE : GEORGES.RDF **RESULT FILE : GR_100YR.RRF** **BOUNDARY FILE : GR_100YR.BSF** **CALCULATED : 23-FEB-1998, 11:58**	**MIKE 11** Figure 12

Appendix 25

149 (2) & (5) Certificates

campbelltown
city council

Issue Date: 20 April 2012
Application Number: 201201113
Receipt Number: 1964209

Globalx Information Services
DX 1239
SYDNEY NSW

Your Reference: 570849-11012

PLANNING CERTIFICATE UNDER SECTION 149 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Section 149 Planning Certificate phone enquiries: (02) 4645 4560.

Property Address: Lot 3 Cambridge Avenue
GLENFIELD NSW 2167

Property Description: Lot 3 DP 736881

As at the date of issue, the following matters apply to the land subject of this certificate:

INFORMATION PROVIDED UNDER SECTION 149(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (the Act)

PART 1 – Names of relevant planning instruments and DCPs

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 1(a) - Rural A Zone

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 6(b) - Regional Open Space Zone

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 5(b) - Special Uses Arterial Roads Zone

(1) In addition to the environmental planning instrument(s) named above, the following planning instruments also apply to the carrying out of development on the land subject of this certificate:

Local environmental plans (LEPs) and deemed environmental planning instruments

Campbelltown LEP No.209 – Exempt Development

For further information about these local environmental plans and deemed environmental planning instruments, contact Council's Environmental Planning Section on (02) 4645 4842.

State environmental planning policies (SEPPs)

SEPP No.1 – Development Standards

SEPP No.4 – Development Without Consent and Miscellaneous Complying Development

SEPP No.6 – Number of Storeys in a Building

SEPP No.21 – Caravan Parks

SEPP No.22 – Shops and Commercial Premises

SEPP No.30 – Intensive Agriculture

SEPP No.33 – Hazardous and Offensive Development

SEPP No.44 – Koala Habitat Protection

SEPP No.50 – Canal Estate Development

SEPP No.55 – Remediation of Land

SEPP No.60 – Exempt and Complying Development

SEPP No.64 – Advertising and Signage

SEPP No.65 – Design Quality of Residential Flat Buildings

SEPP No.70 – Affordable Housing (Revised Schemes)

SEPP No.19 - Bushland in Urban Areas

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Temporary Structures and Places of Public Entertainment) 2007

SEPP (Infrastructure) 2007

SEPP (Exempt and Complying Development Codes) 2008

SEPP (Affordable Rental Housing) 2009

SEPP (State and Regional Development) 2011

Greater Metropolitan REP No.2 - Georges River Catchment

For further information about these State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(2) The following proposed environmental planning instruments, which are or have been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified Council that the making of the proposed instrument has been deferred indefinately or has not been approved), apply to the carrying out of development on the land subject of this certificate:

Draft local environmental plans (LEPs)

None

For further information about these draft local environmental plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Draft State environmental planning policies (SEPPs)

None

For further information about these draft State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(3) The following development control plans (DCPs) apply to the carrying out of development on the land subject of this certificate:

Campbelltown DCP No.82 – Religious Establishment Policy

Campbelltown DCP No.87 – Public Notification & Public Exhibition Policy

Campbelltown DCP No.96 – The Provision of Parenting Facilities

DCP No.99 – Advertising Signs

DCP No.107 – Siting of Communication Facilities (Telecommunication Towers)

Campbelltown DCP No.114 – Trees

Campbelltown DCP No.122 – Restricted Premises

Campbelltown Sex Industry DCP 2003

Campbelltown (Sustainable City) DCP 2009 Volume 2

Campbelltown (Sustainable City) DCP 2009 Volume 1 (Parts 1-8)

Campbelltown DCP No.32 - Retail Plant Propagation Nurseries

DCP No.49 - Rural Environmental Protection Subdivision and Dwelling Policy

Campbelltown DCP No.47 – Amendment to Residential Development Policy – Attached Flats

Campbelltown DCP No.120 - Parking of Commercial Vehicles and Trucks Within Residential, Scenic Protection and Rural Areas

For further information about these development control plans, contact Council's Environmental Planning Section on (02) 4645 4842. Please note that the names of any draft development control plans that apply to the land subject of this certificate, that have been placed on exhibiton by Council but have not yet come into effect, are provided as advice under section 149(5) of the Act.

PART 2 – Zoning and land use under relevant LEPs

a) The following zone(s) apply to the land subject of this certificate:

1(a) - Rural A Zone

6(b) - Regional Open Space Zone

5(b) - Special Uses Arterial Roads Zone

b) The purposes for which the plan or instrument provides that development may be carried out without the need for development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and Campbelltown LEP No.209 – Exempt Development allow certain types of development to be carried out as exempt development within the Campbelltown City local government area.

c) The purposes for which the plan or instrument provides that development may not be carried out except with development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and SEPP No.60 – Exempt and Complying Development allow certain types of development to be carried out as complying development within the Campbelltown City local government area after a complying development certificate has been obtained from Council or from an accredited certifier.

d) The purposes for which the plan or instrument provides that development is prohibited are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

e) Any development standards applying to the land subject of this certificate that fix minimum land dimensions for the erection of a dwelling-house and, if so, the minimum land dimensions so fixed are detailed in the relevant section of the plan or instrument. Reference should be made to either Attachment 2 to this certificate or the appropriate section(s) of the attached copy of the plan or instrument. In addition, certain Council development control plans may impose minimum development standards for the creation of allotments and/or minimum site area and dimensions for the erection of a dwelling-house.

For further information about items a), b), c), d) and e) above, contact Council's Environmental Planning Section on (02) 4645 4842.

f) The land subject of this certificate does not include or comprise critical habitat.

g) The land subject of this certificate is not in a conservation area (however described).

h) No item of environmental heritage (however described) is situated on the land subject of this certificate.

PART 2A – Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

None

PART 3 – Complying development

(1) The land subject of this certificate is land on which complying development may be carried out under the following codes for complying development in accordance with the provisions of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

Housing Alterations Code

General Commercial and Industrial Code

Subdivisions Code

General Development Code

Demolition Code

Please note that reference should also be made to the relevant parts of this policy for the general requirements for complying development and to the relevant codes which may also include provisions relating to zoning, lot size etc.

The land subject of this certificate is land on which no complying development may be carried out under the following codes for complying development because of the provisons of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

General Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy)

Rural Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy or unless complying development is carried out on the part of the lot to which clause 1.19 or 1.17A of this policy does not apply)

(2) For codes identified above as being those under which no complying development may be carried out under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, this is because of the following provisions of clauses 1.17A (c) and (d) and 1.19 of this policy:

The land is reserved for a public purpose in an environmental planning instrument.

PART 4 – Coastal protection

The land subject of this certificate is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that Council has been notified by the Department of Public Works.

PART 5 – Mine subsidence

The land subject of this certificate is not within a proclaimed Mine Subsidence District within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

PART 6 – Road widening and road realignment

The land subject of this certificate is affected by road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993, an environmental planning instrument or a resolution of Council.

PART 7 – Council and other public authority policies on hazard risk restrictions

a) Council has adopted a policy with respect to all land within the Campbelltown City local government area with unusual site conditions. This policy restricts the development of land where extensive earthworks and/or filling has been carried out. Land, the development of

which is restricted by this policy, has a restriction as to user placed on the title of the land stating the details of any restriction. Building lots can be affected by excessive land gradient, filling, reactive or dispersive soils, overland flow and/or mine subsidence. Buildings, structures or site works may require specific structural design to ensure proper building construction. Consequently, some applications may require the submission of structural design details and geotechnical reports. It is suggested that prior to lodging an application, enquiries be made to Council's Planning and Environment Division to ascertain any specific requirements.

b) Council has adopted by resolution the certified Campbelltown LGA Bush Fire Prone Land Map. This map identifies bush fire prone land within the Campbelltown City local government area as defined in section 4(1) of the Act. Where the land subject of this certificate is identified as bush fire prone land, the document entitled "Planning for Bush Fire Protection" prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and dated December 2006 should be consulted with regards to possible restrictions on the development of the land because of the likelihood of bushfire.

c) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of tidal inundation.

d) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of acid sulphate soils.

e) Council has adopted by resolution a policy on contaminated land which may restrict the development of the land subject of this certificate. This policy is implemented when zoning or land use changes are proposed on lands which have previously been used for certain purposes. Council records do not have sufficient information about previous use of this land to determine whether the land is contaminated. Consideration of Council's adopted policy and the application of provisions under relevant State legislation is warranted.

PART 7A – Flood related development controls information

(1) Development on all or part of the land subject of this certificate for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related controls.

(2) Development on all or part of the land subject of this certificate for any other purpose is subject to flood related development controls.

(3) Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

Please note that some additional information regarding flooding and flood related development controls may be provided as advice under section 149(5) of the Act.

PART 8 – Land reserved for acquisition

An environmental planning instrument, deemed environmental planning instrument or draft environmental planning instrument applying to the land subject of this certificate provides for the acquisition of all or part of the land by a public authority, as referred to in section 27 of the Act.

PART 9 – Contribution plans

The following contribution plan(s) apply to the land subject of this certificate:

Campbelltown City Council Section 94A Development Contributions Plan

For further information about these contribution plans, contact Council's Environmental Planning Section on (02) 4645 4196.

PART 9A – Biodiversity certified land

The land subject of this certificate is not biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995).

PART 10 – Biobanking agreement

The land subject of this certificate is not land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only in so far as Council has been notified of the existence of any such agreement by the Director-General of the Department of Environment, Climate Change and Water).

PART 11 – Bush fire prone land

Some of the land subject of this certificate has been identified as bush fire prone land on the Campbelltown LGA Bush Fire Prone Land Map that has been certified by the Commissioner of the New South Wales Rural Fire Service.

Please note that in accordance with section 66 of the Rural Fires Act 1997 and relevant regulations, a Bush Fire Hazard Reduction Notice may have been issued on this land. It is recommended that advice be obtained from the Macarthur Zone Rural Fire Service.

PART 12 – Property vegetation plans

No property vegetation plan applies to the land subject of this certificate as the whole of the Campbelltown City local government area is excluded from the operation of the Native Vegetation Act 2003.

PART 13 – Orders under Trees (Disputes Between Neighbours) Act 2006

No order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land subject of this certificate (but only to the extent that Council has been notified of any such orders).

PART 14 – Directions under Part 3A

No direction, in force under section 75P(2)(c1) of the Act, that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land subject of this certificate under Part 4 of the Act does not have effect, has been issued by the Minister.

PART 15 – Site compatibility certificates and conditions for seniors housing

a) No current site compatibility certificate (seniors housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

b) No conditions of consent to a development application, granted after 11 October 2007, of the kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed in respect of proposed development on the land subject of this certificate.

PART 16 – Site compatibility certificates for infrastructure

No valid site compatibitlity certificate (infrastructure), of which Council is aware, exisits in respect of proposed development on the land subject of this certificate.

PART 17 – Site compatibility certificates and conditions for affordable rental housing

(1) No current site compatibitlity certificate (affordable rental housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

(2) No conditions of consent to a development application of the kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed in respect of proposed development on the land subject of this certificate.

Matters prescribed by section 59(2) of the Contaminated Land Management Act 1997

(a) The land subject of this certificate is not significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) The land subject of this certificate is not subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) The land subject of this certificate is not the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) The land subject of this certificate is not subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) The land subject of this certificate is not the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 provided to Council.

INFORMATION PROVIDED UNDER SECTION 149(5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

All properties within the Campbelltown City local government area may be affected by flooding caused by overland flow or local topography. Applicants will need to make their own assessment of the risk associated with these matters. For more information, contact Council's Flood Mitigation and Drainage Section in writing.

Council has received a copy of the map "Salinity Potential in Western Sydney - 2002" from the Department of Infrastructure, Planning and Natural Resources (DIPNR). This map classifies the land within the Campbelltown City local government area as having either known salinity, high salinity potential, moderate salinity potential or low salinity potential. Salinity issues may be of relevance to any development of the land subject of this certificate. For further information, contact the Department of Infrastructure, Planning and Natural Resources (www.dipnr.nsw.gov.au).

It should be noted that the Commonwealth Department of Transport and Regional Development has released a document titled "Preliminary Flight Paths" purporting to provide preliminary information on jet aircraft flight paths and flight zones for each of the design options for the Second Sydney Airport Proposals. Some of the flight paths and flight zones shown in this document may, if implemented, impact upon the environment in the vicinity of the land subject of this certificate. Further enquiries in respect of this document should be directed initially to the Commonwealth Department of Transport and Regional Development.

The land subject of this certificate has a boundary to a controlled access road.

Council has resolved to prepare a comprehensive Local Environmental Plan for the City of Campbelltown in accordance with relevant statutory requirements. For more information, contact Council's Environmental Planning Section on (02) 4645 4563.

The following draft development control plans (DCPs), that have been placed on exhibition by Council but which have not yet come into effect, apply to the land subject of this certificate:

Draft Campbelltown (Sustainable City) DCP 2011 Volume 1 (Stage 4)

Draft DCP No.102 - Non Urban Subdivision and Development Standards

For further information about these draft development control plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Jeff Lawrence, per
Director Planning and Environment

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 1 (a)—Rural A Zone

(1) **What land is within Zone 1 (a)?**
Land is within Zone 1 (a) if it is shown coloured buff on the map.

(2) **What is the zone objective and what effect does it have?**
The objective of this zone is to identify land that constraints make unsuitable for urban use so that it can be put to long-term agricultural use.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with the objective of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development must not be carried out on land within this zone without consent.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

agriculture; bushfire hazard reduction; drainage; dual occupancies (attached); dwelling houses; forestry; mines; utility installations.

(5) **What development is prohibited?**
Development which is not included in subclause (4) is prohibited on land within this zone.

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 5 (b)—Special Uses Arterial Roads Zone

(1) **What land is within Zone 5 (b)?**
Land is within Zone 5 (b) if it is shown coloured light grey on the map.

(2) **What are the zone objectives and what effect do they have?**
The objectives of this zone are:

(a) to identify land required for existing or proposed arterial roads (including the widening of existing roads), and

(b) to control vehicular access to and from roads in the zone so as not to inhibit the free flow of traffic on arterial roads, and

(c) to allow for the development of such land prior to its acquisition for road purposes.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with one or more of the objectives of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development may be carried out on land within this zone without consent for the purpose of:

drainage; roads; utility installations.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

bushfire hazard reduction (otherwise than in accordance with a bush fire management plan prepared under the *Rural Fires Act 1997*); underground mining.

(5) **What development is prohibited?**
Development is prohibited on land within this zone if it is not included in subclause (3) or (4).

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 6 (b)—Regional Open Space Zone

(1) **What land is within Zone 6 (b)?**
Land is within Zone 6 (b) if it is shown coloured mid green on the map.

(2) **What are the zone objectives and what effect do they have?**
The objectives of this zone are:

(a) to identify land which has been acquired for, or is to be acquired for, regional open space, and

(b) to preserve and manage regional open space for conservation and recreational purposes for the benefit of the Sydney region.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with one or more of the objectives of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development may be carried out on land within this zone without consent for the purpose of:

drainage; utility installations.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

bushfire fighting establishments; bushfire hazard reduction (otherwise than in accordance with a bush fire management plan prepared under the *Rural Fires Act 1997*); car parking; community facilities; recreation areas; recreation facilities; roads; underground mining.

(5) **What development is prohibited?**
Development is prohibited on land within this zone if it is not included in subclause (3) or (4).

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 2

Campbelltown (Urban Area) Local Environmental Plan 2002

32 Subdivision generally

(1) Land to which this plan applies may be subdivided only with development consent.

(2) Consent must not be granted to the subdivision of land traversed by a zone boundary unless the boundaries of lots so created correspond generally with the boundaries between the zones as shown on the map.

(3) Where the subdivision of land would result in the opening of a new road, the road must accord with any pattern of proposed roads indicated on the map unless the consent authority is satisfied that the road will provide adequate access to adjoining land and fulfils the objectives of the road pattern indicated on the map.

33 Subdivision in rural and environmental protection zones

(1) Consent must not be granted to the subdivision of land in a zone specified in the following Table unless the area of any lot created is equal to or greater than that shown opposite that zone in that Table.

Table

Zone	Lot
1 (a)	40 hectares
1 (d)	40 hectares
7 (d1)	100 hectares
7 (d4)	2 hectares
7 (d5)	1 hectare
7 (d6)	0.4 hectare

(2) Despite subclause (1), consent may be granted to the subdivision of land in any of the zones specified in the Table so as to create lots with areas less than those set out in that Table if:

(a) the consent authority is satisfied that the purpose of the subdivision is to create a lot or lots to be used for the purpose of a public utility undertaking or public reserve, or

(b) the consent authority is satisfied that the purpose of the subdivision is to align the boundaries of those lots with the boundaries of a zone so specified.

(2) For the purposes of subclause (2), an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for that zone or the part of that zone within which the existing holding is located.

34 Dual occupancies in certain zones

(1) If two dwellings are situated on the same lot within Zone 2 (b):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 350 square metres.

(2) If two dwellings are situated on the same lot or an existing holding within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than the area for a lot in the zone shown in the Table in clause 33.

35 Erection of dwelling houses or dual occupancies in certain zones

(1) Consent must not be granted to the erection of a dwelling house or a dual occupancy (attached) on land within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6) unless:

(a) the area of the lot on which it is to be erected is equal to or greater than the area shown opposite that zone in the Table in clause 33, and

(b) only one dwelling house or one dual occupancy (attached) is to be erected on the lot.

(2) Despite subclause (1), consent may be granted to the erection of one dwelling house or one dual occupancy (attached) on land within Zone 7 (d4) if:

(a) that land constituted the whole of an existing holding, or

(b) the land is a lot created pursuant to clause 33 (2), but not a lot to be used for the purpose of a public utility undertaking or public reserve.

(3) For the purposes of this clause, an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for the part of that zone within which the existing holding is located.

42C Minto Renewal Project

(1) This clause applies to certain land at Minto, as shown distinctively coloured, edged heavy black and lettered on Sheet 1 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 14)".

(2) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies for one or more of the following purposes:

(a) bushfire fighting establishments,

(b) bushfire hazard reduction,

(c) car parking,

(d) community facilities,

(e) recreation areas,

(f) recreation facilities,

(g) roads,

(h) underground mining.

(3) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies that is within Zone 2 (b) for the purpose of integrated housing development.

(4) If 2 dwellings are situated on the same lot on land that is within Zone 2 (b) on the land to which this clause applies:

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* is prohibited,
unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 300 square metres.

(5) In this clause, *integrated housing development* means development that includes subdivision and that results in:

(a) there being 3 or more dwellings, each on a separate lot, and

(b) the average area of all those separate lots with dwellings is not less than 225 square metres.

Division 2A Edmondson Park Urban Release Area Precinct

51H Density controls

(1) The consent authority must not grant consent to the erection of dwellings on land within the Edmondson Park Urban Release Area Precinct unless the net site density applying in relation to the proposed dwellings on the land is not less than the prescribed net site density applying in relation to the land.

(2) The consent authority must not grant consent to the subdivision of land within the Edmondson Park Urban Release Area Precinct unless the consent authority is of the opinion that the proposal is not inconsistent with the prescribed net site density applying in relation to the land.

(3) Despite subclause (1), the consent authority may consent to the erection of dwellings on land within Zone 2 (c), 3 (a) or 3 (c) even though the net site density applying in relation to the proposed dwellings is less than the prescribed net site density if:

(a) the proposed net site density is not less than the prescribed net site density (if any) that would apply if the boundary of the land was located 60 metres away in at least one direction, and

(b) the consent authority is satisfied that the proposed density is required:

(i) to incorporate an efficient road layout in connection with the proposed development, or
(ii) to achieve the optimum development of the land in a planning and urban design sense.

(4) *State Environmental Planning Policy No 1—Development Standards* does not apply in relation to any prescribed net site density.

(5) In this clause:

net site density, in relation to dwellings, means the ratio that the number of dwellings concerned bears to the area occupied by those dwellings, excluding any public roads, open space or drainage corridors.

prescribed net site density, in relation to land, means the minimum net site density applying in relation to dwellings on the land, as identified on Sheet 2 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 12)".

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

campbelltown
city council

Issue Date: 20 April 2012
Application Number: 201201114
Receipt Number: 1964209

Globalx Information Services
DX 1239
SYDNEY NSW

Your Reference: 570849-11012

PLANNING CERTIFICATE UNDER SECTION 149 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Section 149 Planning Certificate phone enquiries: (02) 4645 4560.

Property Address: Lot 1 Cambridge Avenue
GLENFIELD NSW 2167

Property Description: Lot 91 DP 1155962

As at the date of issue, the following matters apply to the land subject of this certificate:

INFORMATION PROVIDED UNDER SECTION 149(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (the Act)

PART 1 – Names of relevant planning instruments and DCPs

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 1(a) - Rural A Zone

Planning Instrument: Campbelltown (Urban Area) LEP 2002
Effect: 6(b) - Regional Open Space Zone

(1) In addition to the environmental planning instrument(s) named above, the following planning instruments also apply to the carrying out of development on the land subject of this certificate:

Local environmental plans (LEPs) and deemed environmental planning instruments

Campbelltown LEP No.209 – Exempt Development

For further information about these local environmental plans and deemed environmental planning instruments, contact Council's Environmental Planning Section on (02) 4645 4842.

State environmental planning policies (SEPPs)

SEPP No.1 – Development Standards

SEPP No.4 – Development Without Consent and Miscellaneous Complying Development

SEPP No.6 – Number of Storeys in a Building

SEPP No.21 – Caravan Parks

SEPP No.22 – Shops and Commercial Premises

SEPP No.30 – Intensive Agriculture

SEPP No.33 – Hazardous and Offensive Development

SEPP No.44 – Koala Habitat Protection

SEPP No.50 – Canal Estate Development

SEPP No.55 – Remediation of Land

SEPP No.60 – Exempt and Complying Development

SEPP No.64 – Advertising and Signage

SEPP No.65 – Design Quality of Residential Flat Buildings

SEPP No.70 – Affordable Housing (Revised Schemes)

SEPP No.19 - Bushland in Urban Areas

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Temporary Structures and Places of Public Entertainment) 2007

SEPP (Infrastructure) 2007

SEPP (Exempt and Complying Development Codes) 2008

SEPP (Affordable Rental Housing) 2009

SEPP (State and Regional Development) 2011

Greater Metropolitan REP No.2 - Georges River Catchment

For further information about these State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(2) The following proposed environmental planning instruments, which are or have been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified Council that the making of the proposed instrument has been deferred indefinately or has not been approved), apply to the carrying out of development on the land subject of this certificate:

Draft local environmental plans (LEPs)

None

For further information about these draft local environmental plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Draft State environmental planning policies (SEPPs)

None

For further information about these draft State environmental planning policies, contact the Department of Planning (www.planning.nsw.gov.au).

(3) The following development control plans (DCPs) apply to the carrying out of development on the land subject of this certificate:

Campbelltown DCP No.82 – Religious Establishment Policy

Campbelltown DCP No.87 – Public Notification & Public Exhibition Policy

Campbelltown DCP No.96 – The Provision of Parenting Facilities

DCP No.99 – Advertising Signs

DCP No.107 – Siting of Communication Facilities (Telecommunication Towers)

Campbelltown DCP No.114 – Trees

Campbelltown DCP No.122 – Restricted Premises

Campbelltown Sex Industry DCP 2003

Campbelltown (Sustainable City) DCP 2009 Volume 2

Campbelltown (Sustainable City) DCP 2009 Volume 1 (Parts 1-8)

Campbelltown DCP No.120 - Parking of Commercial Vehicles and Trucks Within Residential, Scenic Protection and Rural Areas

For further information about these development control plans, contact Council's Environmental Planning Section on (02) 4645 4842. Please note that the names of any draft development control plans that apply to the land subject of this certificate, that have been placed on exhibiton by Council but have not yet come into effect, are provided as advice under section 149(5) of the Act.

PART 2 – Zoning and land use under relevant LEPs

a) The following zone(s) apply to the land subject of this certificate:

1(a) - Rural A Zone

6(b) - Regional Open Space Zone

b) The purposes for which the plan or instrument provides that development may be carried out without the need for development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and Campbelltown LEP No.209 – Exempt Development allow certain types of development to be carried out as exempt development within the Campbelltown City local government area.

c) The purposes for which the plan or instrument provides that development may not be carried out except with development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and SEPP No.60 – Exempt and Complying Development allow certain types of development to be carried out as complying development within the Campbelltown City local government area after a complying development certificate has been obtained from Council or from an accredited certifier.

d) The purposes for which the plan or instrument provides that development is prohibited are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

e) Any development standards applying to the land subject of this certificate that fix minimum land dimensions for the erection of a dwelling-house and, if so, the minimum land dimensions so fixed are detailed in the relevant section of the plan or instrument. Reference should be made to either Attachment 2 to this certificate or the appropriate section(s) of the attached copy of the plan or instrument. In addition, certain Council development control plans may impose minimum development standards for the creation of allotments and/or minimum site area and dimensions for the erection of a dwelling-house.

For further information about items a), b), c), d) and e) above, contact Council's Environmental Planning Section on (02) 4645 4842.

f) The land subject of this certificate does not include or comprise critical habitat.

g) The land subject of this certificate is not in a conservation area (however described).

h) No item of environmental heritage (however described) is situated on the land subject of this certificate.

PART 2A – Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

None

PART 3 – Complying development

(1) The land subject of this certificate is land on which complying development may be carried out under the following codes for complying development in accordance with the provisions of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

Housing Alterations Code

General Commercial and Industrial Code

Subdivisions Code

General Development Code

Demolition Code

Please note that reference should also be made to the relevant parts of this policy for the general requirements for complying development and to the relevant codes which may also include provisions relating to zoning, lot size etc.

The land subject of this certificate is land on which no complying development may be carried out under the following codes for complying development because of the provisons of clauses 1.17A (c) and (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

General Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy)

Rural Housing Code
(unless the development is only a detached outbuilding or swimming pool on land within a heritage conservation area or a draft heritage conservation area and not subject to any other land exemption under clause 1.19 of this policy or unless complying development is carried out on the part of the lot to which clause 1.19 or 1.17A of this policy does not apply)

(2) For codes identified above as being those under which no complying development may be carried out under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, this is because of the following provisions of clauses 1.17A (c) and (d) and 1.19 of this policy:

The land is reserved for a public purpose in an environmental planning instrument.

PART 4 – Coastal protection

The land subject of this certificate is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that Council has been notified by the Department of Public Works.

PART 5 – Mine subsidence

The land subject of this certificate is not within a proclaimed Mine Subsidence District within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

PART 6 – Road widening and road realignment

The land subject of this certificate is not affected by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993, any environmental planning instrument or any resolution of Council.

PART 7 – Council and other public authority policies on hazard risk restrictions

a) Council has adopted a policy with respect to all land within the Campbelltown City local government area with unusual site conditions. This policy restricts the development of land where extensive earthworks and/or filling has been carried out. Land, the development of which is restricted by this policy, has a restriction as to user placed on the title of the land stating the details of any restriction. Building lots can be affected by excessive land gradient, filling, reactive or dispersive soils, overland flow and/or mine subsidence. Buildings, structures or site works may require specific structural design to ensure proper building construction. Consequently, some applications may require the submission of structural design details and geotechnical reports. It is suggested that prior to lodging an application, enquiries be made to Council's Planning and Environment Division to ascertain any specific requirements.

b) Council has adopted by resolution the certified Campbelltown LGA Bush Fire Prone Land Map. This map identifies bush fire prone land within the Campbelltown City local government area as defined in section 4(1) of the Act. Where the land subject of this certificate is identified as bush fire prone land, the document entitled "Planning for Bush Fire Protection" prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and dated December 2006 should be consulted with regards to possible restrictions on the development of the land because of the likelihood of bushfire.

c) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of tidal inundation.

d) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of acid sulphate soils.

e) Council has adopted by resolution a policy on contaminated land which may restrict the development of the land subject of this certificate. This policy is implemented when zoning or land use changes are proposed on lands which have previously been used for certain purposes. Consideration of Council's adopted policy and the application of provisions under relevant State legislation is warranted.

PART 7A – Flood related development controls information

(1) Development on all or part of the land subject of this certificate for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related controls.

(2) Development on all or part of the land subject of this certificate for any other purpose is subject to flood related development controls.

(3) Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

Please note that some additional information regarding flooding and flood related development controls may be provided as advice under section 149(5) of the Act.

PART 8 – Land reserved for acquisition

An environmental planning instrument, deemed environmental planning instrument or draft environmental planning instrument applying to the land subject of this certificate provides for the acquisition of all or part of the land by a public authority, as referred to in section 27 of the Act.

PART 9 – Contribution plans

The following contribution plan(s) apply to the land subject of this certificate:

Campbelltown City Council Section 94A Development Contributions Plan

For further information about these contribution plans, contact Council's Environmental Planning Section on (02) 4645 4196.

PART 9A – Biodiversity certified land

The land subject of this certificate is not biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995).

PART 10 – Biobanking agreement

The land subject of this certificate is not land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only in so far as Council has been notified of the existence of any such agreement by the Director-General of the Department of Environment, Climate Change and Water).

PART 11 – Bush fire prone land

Some of the land subject of this certificate has been identified as bush fire prone land on the Campbelltown LGA Bush Fire Prone Land Map that has been certified by the Commissioner of the New South Wales Rural Fire Service.

Please note that in accordance with section 66 of the Rural Fires Act 1997 and relevant regulations, a Bush Fire Hazard Reduction Notice may have been issued on this land. It is recommended that advice be obtained from the Macarthur Zone Rural Fire Service.

PART 12 – Property vegetation plans

No property vegetation plan applies to the land subject of this certificate as the whole of the Campbelltown City local government area is excluded from the operation of the Native Vegetation Act 2003.

PART 13 – Orders under Trees (Disputes Between Neighbours) Act 2006

No order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land subject of this certificate (but only to the extent that Council has been notified of any such orders).

PART 14 – Directions under Part 3A

No direction, in force under section 75P(2)(c1) of the Act, that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land subject of this certificate under Part 4 of the Act does not have effect, has been issued by the Minister.

PART 15 – Site compatibility certificates and conditions for seniors housing

a) No current site compatibility certificate (seniors housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

b) No conditions of consent to a development application, granted after 11 October 2007, of the kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed in respect of proposed development on the land subject of this certificate.

PART 16 – Site compatibility certificates for infrastructure

No valid site compatibitlity certificate (infrastructure), of which Council is aware, exisits in respect of proposed development on the land subject of this certificate.

PART 17 – Site compatibility certificates and conditions for affordable rental housing

(1) No current site compatibitlity certificate (affordable rental housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

(2) No conditions of consent to a development application of the kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed in respect of proposed development on the land subject of this certificate.

Matters prescribed by section 59(2) of the Contaminated Land Management Act 1997

(a) The land subject of this certificate is not significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) The land subject of this certificate is not subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) The land subject of this certificate is not the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) The land subject of this certificate is not subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) The land subject of this certificate is not the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 provided to Council.

INFORMATION PROVIDED UNDER SECTION 149(5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

All properties within the Campbelltown City local government area may be affected by flooding caused by overland flow or local topography. Applicants will need to make their own assessment of the risk associated with these matters. For more information, contact Council's Flood Mitigation and Drainage Section in writing.

Council is currently undertaking a flood study of the Bow Bowing / Bunbury Curran Creek

Catchment, of which this property is a part. The results of this study will improve Council's understanding of flood behaviour in the catchment, and the flood affectation of all properties will be reassessed when this study is finalised. It is anticipated that the Floodplain Risk Management Plan will be finalised by the end of 2012.

Council has received a copy of the map "Salinity Potential in Western Sydney - 2002" from the Department of Infrastructure, Planning and Natural Resources (DIPNR). This map classifies the land within the Campbelltown City local government area as having either known salinity, high salinity potential, moderate salinity potential or low salinity potential. Salinity issues may be of relevance to any development of the land subject of this certificate. For further information, contact the Department of Infrastructure, Planning and Natural Resources (www.dipnr.nsw.gov.au).

It should be noted that the Commonwealth Department of Transport and Regional Development has released a document titled "Preliminary Flight Paths" purporting to provide preliminary information on jet aircraft flight paths and flight zones for each of the design options for the Second Sydney Airport Proposals. Some of the flight paths and flight zones shown in this document may, if implemented, impact upon the environment in the vicinity of the land subject of this certificate. Further enquiries in respect of this document should be directed initially to the Commonwealth Department of Transport and Regional Development.

The land subject of this certificate does not have a boundary to a controlled access road.

Council has resolved to prepare a comprehensive Local Environmental Plan for the City of Campbelltown in accordance with relevant statutory requirements. For more information, contact Council's Environmental Planning Section on (02) 4645 4563.

The following draft development control plans (DCPs), that have been placed on exhibition by Council but which have not yet come into effect, apply to the land subject of this certificate:

Draft Campbelltown (Sustainable City) DCP 2011 Volume 1 (Stage 4)

For further information about these draft development control plans, contact Council's Environmental Planning Section on (02) 4645 4842.

Jeff Lawrence, per
Director Planning and Environment

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 1 (a)—Rural A Zone

(1) **What land is within Zone 1 (a)?**
Land is within Zone 1 (a) if it is shown coloured buff on the map.

(2) **What is the zone objective and what effect does it have?**
The objective of this zone is to identify land that constraints make unsuitable for urban use so that it can be put to long-term agricultural use.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with the objective of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development must not be carried out on land within this zone without consent.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

agriculture; bushfire hazard reduction; drainage; dual occupancies (attached); dwelling houses; forestry; mines; utility installations.

(5) **What development is prohibited?**
Development which is not included in subclause (4) is prohibited on land within this zone.

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 1

Campbelltown (Urban Area) Local Environmental Plan 2002

Zone 6 (b)—Regional Open Space Zone

(1) **What land is within Zone 6 (b)?**
Land is within Zone 6 (b) if it is shown coloured mid green on the map.

(2) **What are the zone objectives and what effect do they have?**
The objectives of this zone are:

(a) to identify land which has been acquired for, or is to be acquired for, regional open space, and

(b) to preserve and manage regional open space for conservation and recreational purposes for the benefit of the Sydney region.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with one or more of the objectives of this zone.

A further objective of this zone is to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

(3) **What development may be carried out without consent?**
Development may be carried out on land within this zone without consent for the purpose of:

drainage; utility installations.

(4) **What development may be carried out only with consent?**
Development may be carried out on land within this zone only with consent for the purpose of:

bushfire fighting establishments; bushfire hazard reduction (otherwise than in accordance with a bush fire management plan prepared under the *Rural Fires Act 1997*); car parking; community facilities; recreation areas; recreation facilities; roads; underground mining.

(5) **What development is prohibited?**
Development is prohibited on land within this zone if it is not included in subclause (3) or (4).

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 2

Campbelltown (Urban Area) Local Environmental Plan 2002

32 Subdivision generally

(1) Land to which this plan applies may be subdivided only with development consent.

(2) Consent must not be granted to the subdivision of land traversed by a zone boundary unless the boundaries of lots so created correspond generally with the boundaries between the zones as shown on the map.

(3) Where the subdivision of land would result in the opening of a new road, the road must accord with any pattern of proposed roads indicated on the map unless the consent authority is satisfied that the road will provide adequate access to adjoining land and fulfils the objectives of the road pattern indicated on the map.

33 Subdivision in rural and environmental protection zones

(1) Consent must not be granted to the subdivision of land in a zone specified in the following Table unless the area of any lot created is equal to or greater than that shown opposite that zone in that Table.

Table

Zone	Lot
1 (a)	40 hectares
1 (d)	40 hectares
7 (d1)	100 hectares
7 (d4)	2 hectares
7 (d5)	1 hectare
7 (d6)	0.4 hectare

(2) Despite subclause (1), consent may be granted to the subdivision of land in any of the zones specified in the Table so as to create lots with areas less than those set out in that Table if:

(a) the consent authority is satisfied that the purpose of the subdivision is to create a lot or lots to be used for the purpose of a public utility undertaking or public reserve, or

(b) the consent authority is satisfied that the purpose of the subdivision is to align the boundaries of those lots with the boundaries of a zone so specified.

(2) For the purposes of subclause (2), an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for that zone or the part of that zone within which the existing holding is located.

34 Dual occupancies in certain zones

(1) If two dwellings are situated on the same lot within Zone 2 (b):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 350 square metres.

(2) If two dwellings are situated on the same lot or an existing holding within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than the area for a lot in the zone shown in the Table in clause 33.

35 Erection of dwelling houses or dual occupancies in certain zones

(1) Consent must not be granted to the erection of a dwelling house or a dual occupancy (attached) on land within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6) unless:

(a) the area of the lot on which it is to be erected is equal to or greater than the area shown opposite that zone in the Table in clause 33, and

(b) only one dwelling house or one dual occupancy (attached) is to be erected on the lot.

(2) Despite subclause (1), consent may be granted to the erection of one dwelling house or one dual occupancy (attached) on land within Zone 7 (d4) if:

(a) that land constituted the whole of an existing holding, or

(b) the land is a lot created pursuant to clause 33 (2), but not a lot to be used for the purpose of a public utility undertaking or public reserve.

(3) For the purposes of this clause, an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for the part of that zone within which the existing holding is located.

42C Minto Renewal Project

(1) This clause applies to certain land at Minto, as shown distinctively coloured, edged heavy black and lettered on Sheet 1 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 14)".

(2) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies for one or more of the following purposes:

(a) bushfire fighting establishments,

(b) bushfire hazard reduction,

(c) car parking,

(d) community facilities,

(e) recreation areas,

(f) recreation facilities,

(g) roads,

(h) underground mining.

(3) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies that is within Zone 2 (b) for the purpose of integrated housing development.

(4) If 2 dwellings are situated on the same lot on land that is within Zone 2 (b) on the land to which this clause applies:

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* is prohibited,
unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 300 square metres.

(5) In this clause, *integrated housing development* means development that includes subdivision and that results in:

(a) there being 3 or more dwellings, each on a separate lot, and

(b) the average area of all those separate lots with dwellings is not less than 225 square metres.

Division 2A Edmondson Park Urban Release Area Precinct

51H Density controls

(1) The consent authority must not grant consent to the erection of dwellings on land within the Edmondson Park Urban Release Area Precinct unless the net site density applying in relation to the proposed dwellings on the land is not less than the prescribed net site density applying in relation to the land.

(2) The consent authority must not grant consent to the subdivision of land within the Edmondson Park Urban Release Area Precinct unless the consent authority is of the opinion that the proposal is not inconsistent with the prescribed net site density applying in relation to the land.

(3) Despite subclause (1), the consent authority may consent to the erection of dwellings on land within Zone 2 (c), 3 (a) or 3 (c) even though the net site density applying in relation to the proposed dwellings is less than the prescribed net site density if:

(a) the proposed net site density is not less than the prescribed net site density (if any) that would apply if the boundary of the land was located 60 metres away in at least one direction, and

(b) the consent authority is satisfied that the proposed density is required:

(i) to incorporate an efficient road layout in connection with the proposed development, or
(ii) to achieve the optimum development of the land in a planning and urban design sense.

(4) *State Environmental Planning Policy No 1—Development Standards* does not apply in relation to any prescribed net site density.

(5) In this clause:

net site density, in relation to dwellings, means the ratio that the number of dwellings concerned bears to the area occupied by those dwellings, excluding any public roads, open space or drainage corridors.

prescribed net site density, in relation to land, means the minimum net site density applying in relation to dwellings on the land, as identified on Sheet 2 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 12)".

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Attachment 2

Campbelltown (Urban Area) Local Environmental Plan 2002

32 Subdivision generally

(1) Land to which this plan applies may be subdivided only with development consent.

(2) Consent must not be granted to the subdivision of land traversed by a zone boundary unless the boundaries of lots so created correspond generally with the boundaries between the zones as shown on the map.

(3) Where the subdivision of land would result in the opening of a new road, the road must accord with any pattern of proposed roads indicated on the map unless the consent authority is satisfied that the road will provide adequate access to adjoining land and fulfils the objectives of the road pattern indicated on the map.

33 Subdivision in rural and environmental protection zones

(1) Consent must not be granted to the subdivision of land in a zone specified in the following Table unless the area of any lot created is equal to or greater than that shown opposite that zone in that Table.

Table

Zone	Lot
1 (a)	40 hectares
1 (d)	40 hectares
7 (d1)	100 hectares
7 (d4)	2 hectares
7 (d5)	1 hectare
7 (d6)	0.4 hectare

(2) Despite subclause (1), consent may be granted to the subdivision of land in any of the zones specified in the Table so as to create lots with areas less than those set out in that Table if:

(a) the consent authority is satisfied that the purpose of the subdivision is to create a lot or lots to be used for the purpose of a public utility undertaking or public reserve, or

(b) the consent authority is satisfied that the purpose of the subdivision is to align the boundaries of those lots with the boundaries of a zone so specified.

(2) For the purposes of subclause (2), an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for that zone or the part of that zone within which the existing holding is located.

34 Dual occupancies in certain zones

(1) If two dwellings are situated on the same lot within Zone 2 (b):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 350 square metres.

(2) If two dwellings are situated on the same lot or an existing holding within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6):

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* or the *Community Land Development Act 1989* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than the area for a lot in the zone shown in the Table in clause 33.

35 Erection of dwelling houses or dual occupancies in certain zones

(1) Consent must not be granted to the erection of a dwelling house or a dual occupancy (attached) on land within Zone 1 (a), 7 (d1), 7 (d4), 7 (d5) or 7 (d6) unless:

(a) the area of the lot on which it is to be erected is equal to or greater than the area shown opposite that zone in the Table in clause 33, and

(b) only one dwelling house or one dual occupancy (attached) is to be erected on the lot.

(2) Despite subclause (1), consent may be granted to the erection of one dwelling house or one dual occupancy (attached) on land within Zone 7 (d4) if:

(a) that land constituted the whole of an existing holding, or

(b) the land is a lot created pursuant to clause 33 (2), but not a lot to be used for the purpose of a public utility undertaking or public reserve.

(3) For the purposes of this clause, an *existing holding* is the aggregation of all adjacent or adjoining lots or portions held in the same ownership at the relevant date shown in italics on the map for the part of that zone within which the existing holding is located.

42C Minto Renewal Project

(1) This clause applies to certain land at Minto, as shown distinctively coloured, edged heavy black and lettered on Sheet 1 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 14)".

(2) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies for one or more of the following purposes:

(a) bushfire fighting establishments,

(b) bushfire hazard reduction,

(c) car parking,

(d) community facilities,

(e) recreation areas,

(f) recreation facilities,

(g) roads,

(h) underground mining.

(3) Despite any other provision of this plan, nothing restricts or prohibits the consent authority from granting consent to development of the land to which this clause applies that is within Zone 2 (b) for the purpose of integrated housing development.

(4) If 2 dwellings are situated on the same lot on land that is within Zone 2 (b) on the land to which this clause applies:

(a) the separate occupation of the lots illustrated by a proposed strata plan relating to the dwellings is prohibited, and

(b) subdivision of the land under the *Conveyancing Act 1919* is prohibited,

unless the area of each lot that will be the subject of a separate title for a dwelling when the plan is registered is not less than 300 square metres.

(5) In this clause, *integrated housing development* means development that includes subdivision and that results in:

(a) there being 3 or more dwellings, each on a separate lot, and

(b) the average area of all those separate lots with dwellings is not less than 225 square metres.

Division 2A Edmondson Park Urban Release Area Precinct

51H Density controls

(1) The consent authority must not grant consent to the erection of dwellings on land within the Edmondson Park Urban Release Area Precinct unless the net site density applying in relation to the proposed dwellings on the land is not less than the prescribed net site density applying in relation to the land.

(2) The consent authority must not grant consent to the subdivision of land within the Edmondson Park Urban Release Area Precinct unless the consent authority is of the opinion that the proposal is not inconsistent with the prescribed net site density applying in relation to the land.

(3) Despite subclause (1), the consent authority may consent to the erection of dwellings on land within Zone 2 (c), 3 (a) or 3 (c) even though the net site density applying in relation to the proposed dwellings is less than the prescribed net site density if:

(a) the proposed net site density is not less than the prescribed net site density (if any) that would apply if the boundary of the land was located 60 metres away in at least one direction, and

(b) the consent authority is satisfied that the proposed density is required:

(i) to incorporate an efficient road layout in connection with the proposed development, or
(ii) to achieve the optimum development of the land in a planning and urban design sense.

(4) *State Environmental Planning Policy No 1—Development Standards* does not apply in relation to any prescribed net site density.

(5) In this clause:

net site density, in relation to dwellings, means the ratio that the number of dwellings concerned bears to the area occupied by those dwellings, excluding any public roads, open space or drainage corridors.

prescribed net site density, in relation to land, means the minimum net site density applying in relation to dwellings on the land, as identified on Sheet 2 of the map marked "Campbelltown (Urban Area) Local Environmental Plan 2002 (Amendment No 12)".

NOTE: A copy of the complete written instrument for the Campbelltown (Urban Area) Local Environmental Plan 2002 is available on the NSW Legislation website at: www.legislation.nsw.gov.au.

Appendix 26

Visual Amenity Map

Site Address:

Cambridge Avenue, Glenfield NSW

Legend	Visual Amenity from:
01 - 04	Goodenough St and Fergusson St
05 - 06	Residential area between Railway Parade and Canterbury Rd
07 - 08	Glenfield Rd residential development
09 - 10	Slessor Rd residential area in Casula
11 - 12	Leacocks Ln residential area in Casula

Map Title:	Glenfield Waste Services Visual Amenity Map					**Date:**	21 May 2012
Location:	Glenfield, NSW Australia	**Version No:**	V01	**Map/DWG No:**	**1** of **1**	**Job Ref:**	11012

ENVIRONMENTAL PROPERTY SERVICES
Level 33, 264 George St, Sydney NSW 2000
Level 1, 19 Stockton St, Nelson Bay NSW 2315
Telephone (Sydney): 02 9258 1985
Telephone (Hunter): 02 4981 1600
ABN: 17 143 490 537
Website: www.enviroproperty.com.au

Attachment 2.9

Flood Map

IMPORTANT NOTE:
This plan is prepared for Environmental Property Services from a combination of field survey and existing records for the purpose of designing new constructions on the land and should not be used for any other purpose.
The title boundaries shown hereon were not marked by the author at the time of survey and have been determined by plan dimensions only and not by field measurement.

A services search of the area surveyed above has not been undertaken.
Visible services shown hereon have been located where possible by field survey.
Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.
This note is an integral part of this plan.

LEGEND:

1 In 100 Year Flood RL 12.5 to RL 11.5

REVISION	DATE	DESCRIPTION	CCAD REF	APPROVED
00	07-08-2012	ORIGINAL ISSUE	115831AA	PH

SCALE: HORZ. NOT TO SCALE VERT.
CONTOUR INTERVAL: MAJOR 1.0 MINOR 0.2
B1

HORIZONTAL ORIGIN
COORD. SYSTEM: MGA
MARK ADOPTED: PM 33561
COORDINATES: E 308 018.886 N 6 239 408.040

VERTICAL DATUM
DATUM: AHD
BM ADOPTED: PM 33561 RL: 22.068

HARD & FORESTER
HARD & FORESTER
23–25 Frederick Street
PO Box 175
Rockdale NSW 2216
DX11116 Kogarah
t: (02) 9597 9700
f: (02) 9599 2146
e: survey@hardforester.com.au
w: www.hardforester.com.au
Consulting Surveyors
Hard & Forester Pty Ltd ABN 67 009 841 948

SURVEYED	DRAWN	CHECKED	PASSED
TM	JC	PH	PH

PROJECT:
Southern Flood Parcel
Flood Analysis
(1 in 100 year)

CLIENT: Enviromental Property Services

SHEET 1 OF 1

DRAWING NUMBER	REV
115831003	00

Attachment 2.10 Campbelltown City Council - Bush Fire Prone Land Map for Glenfield Waste Site - 6 June 2014

2.5 Minutes of the Heritage Protection Sub Committee meeting held 25 February 2016

Reporting Officer

Manager Environmental Planning

Attachments

Minutes of the Heritage Protection Sub Committee meeting held 25 February 2016 (contained within this report)

Purpose

To seek Council's endorsement of the minutes of the Heritage Protection Sub Committee meeting held 25 February 2016.

Report

Detailed below are the recommendations of the Heritage Protection Sub Committee. Council officers have reviewed the recommendations and they are now presented for Council's consideration.

Recommendations of the Heritage Protection Sub Committee

Reports listed for consideration

7.1 Hurlstone Agricultural High School - Council Submission on Proposed Sale

That the information be noted.

7.2 Status Update for Heritage related Development Applications

1. That the information be noted.

2. That the Heritage Protection Sub Committee endorses its previous recommendations in relation to Old Kendall's Millhouse Site - 316 Queen Street Campbelltown.

7.3 2016 Heritage Medallion Nominations

1. That the information be noted.

2. That the Acting Director Planning and Environment present a separate confidential report to Council seeking endorsement of the Heritage Protection Sub Committee's recommended recipient/s of the 2016 Heritage Medallion.

8.1 National Parks Association Committee Membership Update

That Council approve the appointment of Ms Alison Cukic as the National Parks Association alternative representative on the Heritage Protection Sub Committee.

8.2 2020 Campbelltown Bicentenary

That the information be noted.

8.3 Hurley Park Heritage Signage

That the information be noted.

Officer's Recommendation

1. That the minutes be noted.

2. That a separate confidential report be presented to Council seeking endorsement of the Heritage Protection Sub Committee's recommended recipient/s of the 2016 Heritage Medallion.

3. That Council approve the appointment of Ms Alison Cukic as the National Parks Association alternative representative on the Heritage Protection Sub Committee.

Committee's Recommendation: **(Rowell/Oates)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Greiss/Kolkman)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 27

That the Officer's Recommendation be adopted.

ATTACHMENT 1

Minutes of the Heritage Protection Sub Committee

Held Thursday 25 February 2016 in Committee Room 3

Meeting Commenced: 6.02pm

1. Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson, Councillor Rowell.

2. Attendance and Apologies

Attendance:
Councillor Ted Rowell - Chairperson Campbelltown City Council
Councillor Bob Thompson - Deputy Chair Campbelltown City Council
Clarice Stretch - Campbelltown Airds Historical Society
Robert Wheeler - National Parks Association
Sue Kijurina - Campbelltown Airds Historical Society
Kay Hayes - Campbelltown Airds Historical Society

Also in Attendance:
Jim Baldwin - Acting Director Planning & Environment
Andrew Spooner - Manager Sustainable City & Environment
Melinda Willcocks - Marketing and Tourism Coordinator
Brendan Leo - Acting Manager Development Services
Alison Cukic - Observer
Jane Worden - Executive Support

Apologies:
James Gardner - Qualified Person
Jeff Burton - Senior Strategic Environmental Planner

Sub Committee's Recommendation: (Hayes/Stretch)

That the above apologies be accepted.

CARRIED

3. Declarations of Interest

There were no Declarations of Interest made at this meeting.

4. Minutes of the Previous Meeting

Reporting Officer

Manager Sustainable City and Environment

Report

The Minutes of the Heritage Protection Sub Committee Meeting held on 26 November 2015, copies of which were circulated to each Sub Committee member, were presented to Council for adoption at its meeting on 16 February 2016.

Council was requested to adopt the Minutes in accordance with the Officer's recommendation.

Due to the timing of the Council meeting and the deadline for the agenda of this meeting to be finalised and distributed, a verbal update on Council's resolution on the matter will be provided to the Sub Committee members.

Officer's Recommendation

That the information be noted.

Sub Committee Note:

Council's Manager Sustainable City and Environment advised the Sub Committee members of additional recommendations made by Council when considering the previous Heritage Protection Sub Committee minutes at its meeting held on 16 February 2016 as follows:

- that when any application is received for Raith, it be referred to the Heritage Protection Sub Committee for comment
- that the issues relating to the sale of the Hurlstone Agricultural High School land be referred to the Heritage Protection Sub Committee for comment
- that the development application for Macquarie Fields House be referred to the Heritage Protection Sub Committee for comment.

Sub Committee's Recommendation: (Thompson/Wheeler)

That the information be noted.

CARRIED

5. Business Arising from Previous Minutes

Reporting Officer

Manager Sustainable City and Environment

Purpose

To report on business arising from the Minutes of the Heritage Protection Sub Committee Meeting held on 26 November 2016.

Report

The Minutes of the Heritage Protection Sub Committee meeting held on 26 November 2015 were considered by Council at its meeting on 16 February 2016.

The matters of business arising from the previous minutes relate to the following relevant items as detailed below:

(Item 7.1) Redevelopment of the local listed heritage item Old Kendall's Millhouse Site - 316 Queen Street, Campbelltown

That Council considers the following comments from the Heritage Protection Sub Committee when determining Development Application 2777/2015/DA-C relating to the redevelopment of the local heritage listed 'Old Kendall's Mill House' site at 316 Queen Street Campbelltown:

- That the proponent be requested to provide Council with a Conservation Management Plan and Heritage Impact Statement and that this information be referred to the Heritage Protection Sub Committee for consideration; and

- That the proposal is considered to be an overdevelopment and would adversely impact upon the heritage significance of the site.

The comments of the Heritage Protection Sub Committee have been considered by Council in the assessment of the subject application. A separate report on this matter is provided for the information of the Heritage Protection Sub Committee under the current meeting agenda.

(Item 7.2) Subdivision of the State listed Heritage Item 'Epping Forest' - Mississippi Crescent, Kearns

That Council considers the following comment from the Heritage Protection Sub Committee when determining Development Application 2400/2015/DA-S relating to the subdivision of the State Listed Heritage Item 'Epping Forest' Mississippi Crescent, Kearns into five Torrens Title allotments:

- That Council's assessment of the proposal be deferred subject to a more detailed Conservation Management Plan and Heritage Impact Statement being lodged with Council for its consideration.

The comments of the Heritage Protection Sub Committee have been considered by Council in the assessment of the subject application. A separate report on this matter is provided for the information of the Heritage Protection Sub Committee under the current meeting agenda.

(Item 8.11) Heritage Protection Sub Committee Membership Update

1. That Council accept the resignation of Mr Mario Majarich as an alternative voting member of the Heritage Protection Sub Committee and send a letter of appreciation to him.

2. That the National Parks Association identifies an alternative voting delegate on their behalf.

A letter of appreciation has been sent to Mr Majarich thanking him for his valued contribution to the Heritage Protection Sub Committee. Council's current delegate of the National Parks Association (Mr Robert Wheeler) has also been requested to identify a replacement alternative voting delegate and to advise the Heritage Protection Sub Committee accordingly.

Sub Committee's Recommendation: (Stretch/Wheeler)

That the information be noted.

CARRIED

6. Correspondence - Nil

7. Reports

7.1 Hurlstone Agricultural High School - Council Submission on Proposed Sale

Reporting Officer

Manager Sustainable City and Environment

Purpose

The purpose of this report is to update the Heritage Protection Sub Committee on the response of Campbelltown City Council to the proposed relocation of Hurlstone Agricultural High School by the State Government.

Report

At the Heritage Protection Sub Committee meeting held on 26 November 2015, the Sub Committee discussed the recent announcement by the State Government of its intention to relocate the historic Hurlstone Agricultural High School to the Western Sydney University's Hawkesbury Campus at Richmond.

The NSW Government has advised that the relocation is planned to occur in 2020, and will involve the sale of 140-hectares of land surrounding the existing school for development of new housing and a primary school.

The current building of Hurlstone Agricultural High, which has been there since 1926, is intended to become a new Glenfield high school. The capacity of the re-developed building is proposed to be expanded to accommodate a further 360 selective school spaces.

Council considered the matter at its meeting held on 15 December 2015, and again at its extraordinary meeting held on 22 December 2015. Council's resolution on the matter was as follows:

1. That Council writes to the Premier, Minister for Education and the Department of Education requesting the NSW Government abandon its decision to move Hurlstone Agricultural High School from Glenfield to Hawkesbury.

   The correspondence is to articulate the following:

   - expresses Council's disappointment to the Minister for Education and his Department for the lack of consultation with Campbelltown City Council and school community regarding the relocation of an iconic School
   - the Historical and heritage value of the school's name to Campbelltown and the Macarthur region
   - the social significance and military heritage connection to the Memorial Forest within the local area
   - the current Macarthur agricultural student enrolment and the future skills knowledge demands for agricultural studies and Science, Technology, Engineering and Mathematics (STEM) within the Macarthur and South West Sydney region
   - the need for the preservation of appropriate environmental buffers on the Glenfield site as part of any redevelopment of the land
   - any redevelopment of the land must incorporate new and significant employment development initiatives to balance the extent of urban development on the land and elsewhere in the Glenfield to Macarthur Corridor.

2. That, in the event that surplus land is sold then; Council requests the NSW Government to review the Glenfield Precinct Land use and Infrastructure Plan (Glenfield to Macarthur Urban Corridor Strategy) as a matter of urgency, and in collaboration with Council, to take account of the potential future development of surplus land at the Hurlstone Agricultural High School.

3. That such review must articulate an appropriate vision for the whole Glenfield Precinct and involve the engagement of the community to reconsider:

   - housing supply and density
   - services, facilities and community amenity
   - job creation
   - the movement network including traffic and transport
   - built and environmental outcomes
   - infrastructure capacity.

4. That Council advise the NSW Government that the revised Land use and Infrastructure Plan for the Glenfield Precinct as agreed to by Council shall:

- form the basis of detailed site planning for the surplus land at Hurlstone
- complement the planning outcomes set out in the Glenfield Precinct Land use and Infrastructure Plan.

Council subsequently wrote to the NSW Premier on 12 January 2016 and raised a number of concerns with the decision, including the potential impacts that the sale and redevelopment of the school would likely have on the historical and heritage significance of the site for the Campbelltown area.

A copy of the letter sent to the NSW Premier by Council on the proposed sale and redevelopment of Hurlstone Agricultural High School is attached for the information of the Heritage Protection Sub Committee. Council is continuing to liaise with the NSW Government to try and facilitate an amicable resolution to the concerns and issues raised by Council.

Officer's Recommendation

That the information be noted.

Sub Committee's Recommendation: (Hayes/Stretch)

That the information be noted.

CARRIED

7.2 Status Update for Heritage related Development Applications

Reporting Officer

Manager Development Services

Purpose

The purpose of this report is to provide an update to the Heritage Protection Sub Committee on the assessment of current Development Applications relating to listed heritage items within the Campbelltown Local Government Area.

Report

Council is currently assessing five development applications relating to heritage listed properties within the Campbelltown Local Government Area. Several of these applications have previously been reported to the Heritage Protection Sub Committee for consideration and comment.

A brief description and update on the assessment status of each of these applications is provided below for the information of the Sub Committee.

- **Campbellfield (Redfern's) Cottage - Lind Street , Minto**

DA 2952/2014 - Construction of Medical Centre and Childcare Centre. A plan of the proposed development layout on the subject land is provided in Attachment 1.

The HPSC was informed of Council's receipt of the subject application at its meeting of 12 February 2015.

Status: The application has been deferred by Council as there are a number of deficiencies in the proposal, including potential impacts on the heritage significance of Campbellfield cottage. The applicant has provided a response to the matters raised by Council, and this information is currently under assessment. It is noted that Council has engaged Paul Davies Heritage Architects to assist with the assessment of the potential impacts of the proposed development on the heritage item.

- **Epping Forest - Mississippi Crescent, Kearns**

DA 2400/2015 - Subdivision into 5 Torrens Title allotments. A plan of the proposed subdivision is provided in Attachment 2.

The subject site is listed as a State Heritage Item and contains a main house of the Old Colonial Georgian architectural style with veranda and a range of sheds consistent with the use of the site as a farming complex.

The HPSC considered an information report on the proposal at its meeting of 26 November 2015, and recommended the following:

> That Council's assessment of the proposal be deferred subject to a more detailed Conservation Management Plan and Heritage Impact Statement being lodged with Council for its consideration.

Status: Insufficient information has been submitted with the application to allow a compressive assessment of the application to be undertaken. Council has raised a number of issues / concerns with the proponent and deferred the application for additional and revised information in accordance with the above recommendation.

- **Old Kendall's Millhouse Site - 316 Queen Street Campbelltown**

DA 2777/2015 - Alterations and additions to existing heritage building and construction of multi storey commercial and residential building. A photomontage of the proposed development is provided in Attachment 3.

The HPSC considered an information report on the proposal at its meeting of 26 November 2015, and recommended the following:

a) That the proponent be requested to provide Council with a Conservation Management Plan and Heritage Impact Statement and that this information be referred to the Heritage Protection Sub Committee for consideration; and

b) That the proposal is considered to be an overdevelopment and would adversely impact upon the heritage significance of the site.

Status: The proposal is not considered supportable in its current form. Council has raised a number of issues / concerns with the proponent and deferred the application for additional and revised information in accordance with the above recommendation.

- **Caversham - 26 Oxley Street, Campbelltown**

DA 3065/2015 - Proposed use of existing building as a dwelling and home office (Macarthur Lady Funerals) and construction of a metal garage at rear of property. A plan of the proposed development layout on the site is provided in Attachment 4.

The proposal involves the use of the existing building as a dwelling and home office for Macarthur Lady Funerals. A detached metal garage is also proposed at the rear of the property.

The HPSC may recall that it previously considered a development application (DA 794/2012) in 2012 for the conversion and use of the property as a funeral parlour office. This application was conditionally approved by Council, and required a schedule of conservation works to be undertaken on the building and completion of external landscape works.

Status: The application has been deferred given a number of inconsistencies in the information submitted, including incomplete details of compliance with the earlier development consent issued for the property (DA 794/2012).

- **Macquarie Field House - Campbelltown Road, Glenfield**

DA 3510/2015 - Concept Master Plan for Residential Subdivision for Macquarie Field House (State Listed Heritage Item). A copy of the concept master plan for the proposed subdivision of the land is provided in Attachment 5.

The application was lodged with Council on 10 December 2015 and is for a concept master plan only. If approved, the proposed subdivision would be undertaken in a series of stages and be subject to future development applications.

The master plan proposes the provision of 69 residential allotments, ranging in size from 1,004sqm to 5,458sqm, the provision of roads, landscaping and community open space including a specially constructed lake. Access to the proposed subdivision would be from Quarter Sessions Road.

Macquarie Field House and its associated farm buildings are proposed be retained in a hilltop setting, with income generated from the sale of residential allotments to be utilised for the maintenance and conservation of the heritage listed buildings.

Status: The application is under assessment and is on public exhibition until 14 March 2016. The application has also been forwarded to the NSW Heritage Office for concurrence under the NSW Heritage Act 1977 given that Macquarie Field House is a State listed heritage item.

It is noted that Council will not be the consent authority for this application as the value of works exceeds the prescribed threshold of $20M. In this respect, the application will be reported to the Joint Regional Planning Panel for determination.

Conclusion

This report provides a brief summary of the assessment status of five separate development applications currently being considered by Council that relate to heritage listed properties within the Campbelltown Local Government Area.

Except for the most recently lodged development application relating to Macquarie Field House, Council has requested additional information from each applicant having regard to deficiencies in the details submitted and/or comments already provided by the Heritage Protection Sub Committee.

Further discussion and an update on the assessment progress of these applications will be provided to Sub Committee members by Council's Acting Manager Development Services at the Heritage Protection Sub Committee meeting on 25 February 2015.

Officer's Recommendation

That the information be noted.

Sub Committee Note:

Council's Acting Manager Development Services advised Sub Committee members that the Development Application for Caversham - 26 Oxley Street, Campbelltown has been withdrawn by the applicant.

Councillor Ted Rowell noted that there is some Graffiti located at the Old Kendall's Millhouse Site and requested that Council officers follow up with the owner of the site with a view to having the graffiti removed. Council's Acting Director Planning and Environment advised will raise the matter of graffiti removal with the owner.

Sub Committee's Recommendation: (Stretch/Wheeler)

1. That the information be noted.

2. That the Heritage Protection Sub Committee endorses its previous recommendations in relation to Old Kendall's Millhouse Site - 316 Queen Street Campbelltown.

CARRIED

7.3 2016 Heritage Medallion Nominations

Reporting Officer

Manager Sustainable City and Environment

Purpose

The purpose of this report is to seek a recommendation from the Heritage Protection Sub Committee on the preferred candidate for the 2016 Campbelltown Heritage Medallion.

Background

The Campbelltown Heritage Medallion is a biennial award that is open to individuals, businesses, community groups, schools or tertiary institutions that have made a significant contribution to the Campbelltown Local Government Area, in the area/s of:

a. the preservation and promotion of natural and/or built heritage
b. cultural and religious traditions
c. cultural functions, festivals and crafts
d. urban planning and development patterns
e. innovative product development over time
f. intellectual and scientific work undertaken within Campbelltown (for example, in the g. fields of agriculture, industry, science and technology

The Campbelltown Heritage Medallion is undertaken as part of Council's participation in the 2016 National Trust Heritage Festival in April and May. The theme for this year's Heritage Festival is 'Discovery and Rediscoveries' - a celebration that encompasses the experience of discovering something for the first time or rediscovering something that has been lost, forgotten or concealed.

Council has embraced the National Trust's broad concept of 'heritage' for the purposes of the awarding the Heritage Medallion, which is very broad in nature and covers all that we, as a society, value today and wish to pass on to future generations. This includes intangible as well as tangible heritage - language and customs, as well as places and moveable collections.

Report

Nominations for Campbelltown's Heritage Medallion were opened to the public on 14 December 2015 and closed on 10 February 2016.

The nomination form was made available to the public via the Campbelltown Arts Centre and Campbelltown City Council websites and Facebook pages, as well as circulated via email and post to a wide local network of primary and secondary schools, historical groups and museums, community cultural development groups, environmental groups, Indigenous organisations, as well as past nominators of the Heritage Medallion and the Campbelltown City Australia Day Awards.

Nomination forms contained information about the Festival, the Medallion nomination process, and the National Trust's definition of heritage (and appropriate examples) to assist people in understanding the definition of Heritage that Council embraces for the purposes of this award.

Those submitting nominations for the 2016 Heritage Medallion were requested to address the following selection criteria:

a. That the activity undertaken makes a substantial contribution to preserving or promoting Campbelltown's Heritage;
b. That the achievement has a significant and enduring impact on the community;
c. That the achievement is of exceptional relevance to the Campbelltown's Heritage;
d. That the achievement gives a positive impression on Campbelltown's image and profile

The following nominations were received for the 2016 Heritage Medallion and are included as an attachment to this report.

1. Campbelltown Public School, nominated by Miss Anna Butler
2. Campbelltown Patchwork and Quilters Guild, nominated by Denise Pritchard
3. Mr David Vassallo, nominated by Mr Matthew Affleck
4. Campbelltown Uniting Care, nominated by John Russell
5. St Patrick's College, nominated by Mrs Fran Musico Rullo
6. Bambi Kindergarten Association Inc., nominated by Mrs Alicia Harrington
7. Winga Myamly Reconciliation Group, nominated by Sister Patricia Murphy
8. Mrs Marie Rutledge, nominated by Mrs Jossleen Crane
9. Pat McGeown, nominated by Mr Greg Warren MP
10. Campbelltown Mall, nominated by Mr Jarryd Tierney
11. Macarthur Centre for Sustainable Living, nominated by Ms Helen Byfield-Fleming
12. Tharawal Aboriginal Corporation/Aboriginal Medical Service, nominated by Mr Nick Rosser.
13. Campbelltown Veterans Recreation Centre, nominated by Ms Susan Lakeman

The Heritage Medallion Advisory Panel, consisting of the Chairperson and a member of the Heritage Protection Sub Committee, Council's Acting Director Planning and Environment, and Council's Manager Cultural Services, met after the closing of nominations to consider the nominations and make a recommendation on the preferred finalist to the Heritage Protection Sub Committee.

Given the narrow timing between the close of nominations and the February meeting of the Heritage Protection Sub Committee, a verbal update on the nominations, selection process and recommendation of the Heritage Medallion Advisory Panel will be given to the Sub Committee. Following discussion, the Heritage Protection Sub Committee is requested to provide a recommendation to Council regarding the preferred recipient of the 2016 Heritage Medallion.

The recipient of the Campbelltown Heritage Medallion is to be announced at Campbelltown's Heritage Forum, to be held during April at Campbelltown Arts Centre. All nominees will be invited to attend.

A summary of the information presented in the 12 nominations received in 2016 is provided below:

Note: They are in no particular order.

1. Nominee: Campbelltown Public School
   Nominator: Miss Anna Butler

Summary

Campbelltown Public School has been nominated for its efforts in gathering information on the local history of the school through the collecting of oral histories, photos, newspaper articles and school memorabilia from former students. This information has been compiled and digitised to create a timeline of the school's, and consequently, Campbelltown's history, augmenting the earlier bank of knowledge and ensuring that it is permanently available to the school and the wider community. This initiative has been undertaken in celebration of the school's 140th Anniversary. The archives will continue to provide the school and local community with a strong and positive sense of local identity. The school also created a wall mural in 1988 illustrating the significant buildings of Campbelltown, and participates each year in the Elizabeth Macarthur History Competition.

2. Nominee: Campbelltown Patchwork and Quilters Guild
   Nominator: Ms Denise Pritchard

Summary

Campbelltown Patchwork and Quilters Guild has been nominated for its significant and long-standing work in the local community. The Guild has been operating since 1995 and is an important part of the cultural heritage of Campbelltown, providing a tangible link to the crafts of early European arrivals to the area and demonstrating its relevance to 21st Century residents. The Guild has donated hundreds of quilts to local charities, nursing homes, youth and women's refuges, families dealing with SIDS, SAS troops and Campbelltown Meals on Wheels. The Guild regularly participates in open days at Glenalvon House, providing quilts for display and conducting demonstrations. The Guild also presented an original design quilt to the Koshigaya community on a friendship visit to Japan.

3. Nominee: Mr David Vassallo
   Nominator: Mr Matthew Affleck

Summary

David Vassallo has been nominated for his commitment of over 25 years to the local community. David has served as one of the main organists of the John Therry Catholic Church, Raith House (Bradbury) and the Campbelltown and Airds Historical Society, and continues to attract new people to these sites through his passionate playing of the organ and pianola, and detailed demonstrations of the instruments to community members. When Raith House burnt down and was at risk of demolition, David communicated with Council and in particular Councillor Meg Oats to ensure the building would be safe from demolition. David has been able to get some amazing photos of the home before, during and after the rebuild and has worked closely with the Historical Society to archive these images.

4. Nominee: Campbelltown Uniting Care
   Nominator: Mr John Russell

Summary

Campbelltown Uniting Care has been nominated for its commitment over the last 34 years to the local community in the areas of child protection, youth homelessness, people with a disability, child literacy and refugees. Some examples of Uniting Care's involvement in the community include the establishment of the Cottage Family Care Centre, the only preschool in Australia that was working with children who were abused or neglected; operating of the Stepping Stone Community, a house for homeless youth for over 30 years (now under the operation of Burnside); and establishment of the self-funded Literacy Centre since 1992, which provides individualised support for children with learning difficulties. Campbelltown Uniting Care also established Hurley House in 1994 for young adults with an intellectual disability, which has been operating for 21 years, and also Focus on Families to support first time mothers, later expanding the service to include mums with cancer, and mums with multiple babies. Currently, Uniting Care is working to support refugees from war torn Burindi.

5. Nominee: St Patrick's College
   Nominator: Mrs Fran Musico Rullo

Summary

St Patrick's College has been nominated for its efforts in preserving Campbelltown's heritage and promoting the profile of the region through the gathering and updating of information on the local history of the school, in celebration of its 175th anniversary. The College continues to collect oral histories, photos, newspaper articles and school memorabilia from former students to build this archive, which has been digitised to create a timeline of the school's, and consequently, Campbelltown's history. The College also initiated and drove student research projects related to Campbelltown's World War 1 heritage. The College is committed to raising awareness to the wider community about the College's heritage.

6. Nominee: Bambi Kindergarten Association Inc.
   Nominator: Mrs Alicia Harrington

Summary

Bambi Kindergarten Association Inc. was established in 1952 by wives of servicemen based at Ingleburn Military Camp and who were fighting in the Korean War. It has operated in the community for 64 years and is considered an icon within the local community though its service to children, families, and children with special needs. It has been nominated for its ongoing work in the community and as a 'living memorial' to both civilian and defence force families. Bambi was accredited as a 'Centre of Excellence' with the Australian Early Childhood Association's pilot accreditation program in 1993, and includes a registered memorial in the grounds of the preschool, honouring the soldier's "Missing In Action" during the Korean War. Bambi is supported by the Korean Veteran's Association.

7. Nominee: Winga Myamly Reconciliation Group
   Nominator: Sister Patricia Murphy

Summary

Winga Myamly Reconciliation Group has been nominated for its ongoing work in the Campbelltown area to promote reconciliation and a deeper understanding and awareness of Aboriginal culture. The Group was established in 1993 after finding there was limited knowledge in the broader community of the Appin Massacre of the Dharawal people in 1816. In consultation with Dharawal descendants and local Aboriginal people, the group commenced gatherings at the Cataract Dam where the massacre took place, and over time this has grown into a significant Memorial Ceremony held on the anniversary of the massacre, which draws people from widespread areas. The event ensures that the significance of the Massacre is acknowledged, and that the Dharawal

people are honoured for the importance they have in the history of Campbelltown and its surrounds. A plaque was erected at Cataract Dam in 2006 with a grant from Wollondilly Council.

8. Nominee: Mrs Marie Rutledge
Nominator: Mrs Jossleen Crane

Summary

Marie Rutledge has been nominated for her longstanding commitment to the local community, since moving to Campbelltown in 1956. Marie is well-known for her involvement in the Festival of Fisher's Ghost on various Festival Committees, has been heavily involved in raising of money for the Festival, and was elected President for a period of 6 years. She established Miss Princess Quest more than 20 years ago, and has also been involved with the Torch Bearers for Legacy (where she spent a number of years as Secretary and President) and the Returned Services League of Australia. Marie joined the early Friends of the Art Gallery and was involved with the raising of money to build the first Art Gallery in Campbelltown. She has received a number of prestigious awards for her outstanding work with the local community at a grassroots level.

9. Nominee: Mr Pat McGeown
Nominator: Mr Greg Warren MP

Summary

Pat McGeown has been nominated for his passion and commitment to the arts and heritage within the Campbelltown region, through the sharing of the stories and journeys of local people he interviews on his radio show "Sunday nights with Captain Pat", since 2006. Over the years Pat has interviewed thousands of local people, musicians and bands, emerging artists, journalists and humanitarians, and shared their interesting stories. Pat volunteers much of his time in charities and local events and continues to be passionate about promoting the local area and its rich heritage.

10. Nominee: Campbelltown Mall
Nominator: Mr Jarryd Tierney

Summary

Campbelltown Mall has been nominated for its commitment to actively supporting the community of Campbelltown since it opened its doors in 1984. The Mall has partnered with organisations such as the 24 Hour Fight Against Cancer to help local residents, Lifeline Macarthur to support the much needed volunteers working with the local people of Campbelltown who are in need, and continues to support the Campbelltown Mayors Christmas Appeal. The Mall has also been a proud sponsor of the Campbelltown Eagles Junior Rugby Club, along with running the Green Ambassador Award with local schools to encourage children to take care of their environment.

11. Nominee: Macarthur Centre for Sustainable Living
Nominator: Ms Helen Byfield-Fleming

Summary

The Macarthur Centre for Sustainable Living has been nominated for its ongoing commitment to sustainable living as a not-for-profit, community-driven organisation. The Centre runs workshops for the local community, educational programs for child care centres, schools, and tertiary organisations, and acts as a community hub where visitors can gain free information on sustainable living. The Centre's workshop program is sponsored by Campbelltown City Council. Visitation to the Centre has increased rapidly since 2010, due to an increase in the activities developed and run by the Centre, and the consolidation of the Centre's education program. The Centre continues to be involved in many local events such as River Fest, Healthily Living Expo, and local NAIDOC week events.

12. Nominee: Tharawal Aboriginal Corporation/Aboriginal Medical Service
Nominator: Mr Nick Rosser

Summary

The Tharawal Aboriginal Corporation/Aboriginal Medical Service has been nominated for their continuous support in local Aboriginal health, culture and heritage for nearly 35 years. They have developed important partnerships with NGO's as well as the local health districts, schools and Campbelltown City Council, which have developed into programs linking local Aboriginal people to vital support services. Complementing this, the Oorungah Wandarah and Waranwarin early childhood centre provides a comprehensive approach to supporting children's education by engaging with parents. The Tharawal Men's group also provide a vital approach to cultural preservation to younger generations throughout the community. Tharawal is a widely recognised centre of excellence and continues to support the Indigenous community to grow, live and develop.

13. Nominee: Campbelltown Veteran's Recreation Centre
Nominator: Ms Susan Lakeman

Summary

Campbelltown Veteran's Recreation Centre has been nominated for its ongoing support of the local community. This is a non-profit centre located in historic Dredges Cottage which provides activities and assistance to returned military personnel and their families as well as operating a small museum on the grounds. They have undertaken a number of activities designed to preserve the memory of those who served from the Macarthur area, including refurbishing old photographs of significance for display in the museum, engaging a local historic researcher to accurately record and the names of military personnel for preservation on a series of plaques installed in the Memorial Wall on the grounds of the Cottage, and producing an illustrated book of the stories of the men and women of World War 1 to be made available, free of charge to schools.

Officer's Recommendation

1. That the information be noted.

2. That the Heritage Protection Sub Committee makes a recommendation for the 2016 Heritage Medallion.

Sub Committee's Recommendation: (Wheeler/Hayes)

1. That the information be noted.

2. That the Acting Director Planning and Environment present a separate confidential report to Council seeking endorsement of the Heritage Protection Sub Committee's recommended recipient/s of the 2016 Heritage Medallion.

CARRIED

8. General Business

8.1 National Parks Association Committee Membership Update

Council's Manager Sustainable City and Environment advised the Sub Committee that the National Parks Association has nominated Ms Alison Cukic as their alternate voting delegate on the Heritage Protection Sub Committee.

Sub Committee's Recommendation: (Wheeler/Stretch)

That Council approve the appointment of Ms Alison Cukic as the National Parks Association alternative representative on the Heritage Protection Sub Committee.

CARRIED

8.2 2020 Campbelltown Bicentenary

Campbelltown Airds Historical Society representative Clarice Stretch made enquires with Council officers regarding the progress of preparations for the Campbelltown Bicentenary which will take place in 2020. It was noted that Council will be approaching various groups to discuss ideas for the bicentennial celebrations closer to the event date.

In order to assist and support Council in its preparation for this event, the Campbelltown Airds Historical Society provided Council with a design for a proposed memorial to Macquarie sourced from the Campbelltown Airds Historical Society archives. Council's Manager Sustainable City and Environment thanked the Campbelltown Airds Historical Society for the information which will be considered appropriately.

Sub Committee's Recommendation: (Stretch/Hayes)

That the information be noted.

CARRIED

8.3 Hurley Park Heritage Signage

Council's Manager Sustainable City and Environment provided Sub Committee members with an update in relation to the progress of the installation of the interpretative signage (cattle tank and silt traps) currently being erected in Hurley Park.

It was noted that the base support for the signage has been installed and once the base concrete has set the remaining work for the cattle tank signage will be carried out. It is anticipated that this work will be completed over the next few days.

Sub Committee's Recommendation: (Wheeler/Stretch)

That the information be noted.

CARRIED

Next meeting of the Heritage Protection Sub Committee will be held on 26 May 2016 at 6.00pm in Committee Room 3.

Councillor Ted Rowell
Chairperson

Meeting Concluded: 6.48pm

3. DEVELOPMENT SERVICES

3.1 Development Services Section Statistics - January 2016

Reporting Officer

Acting Manager Development Services

Attachments

Development Services application statistics for January 2016 (contained within this report)

Purpose

To advise Council of the status of development and other applications within the Development Services section.

Report

In accordance with Council's resolution of 23 August 2005 that Councillors be provided with regular information regarding the status of development applications, the attachment to this report provides details of key statistics for January 2016 as they affect the Development Services section.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: **(Thompson/Rowell)**

That the Officer's Recommendation be adopted.

CARRIED

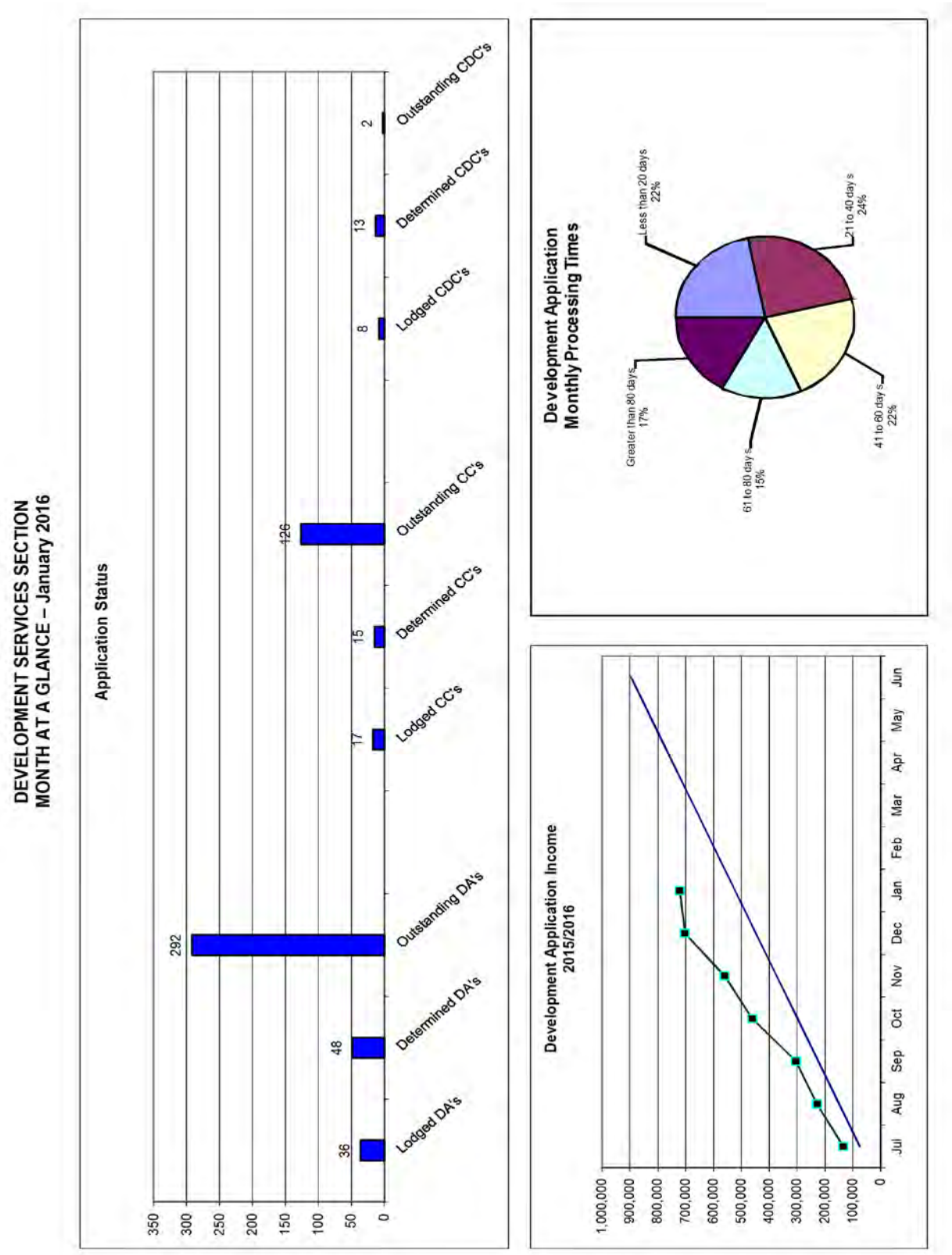
Council Meeting 22 March 2016 **(Greiss/Kolkman)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 27

That the Officer's Recommendation be adopted.

ATTACHMENT 1



3.2 Council's Monitoring and Reporting obligations of Variations to Development Standards allowed under State Environmental Planning Policy No. 1 - Development Standards (SEPP 1)

Reporting Officer

Acting Manager Development Services

Attachments

SEPP 1 variations approved for the period October to end December 2015 (contained within this report)

Purpose

To advise Council of development applications approved for the period 1 October 2015 to 31 December 2015 that involved a variation of a development standard allowed under the relevant provisions of the State Environmental Planning Policy No. 1 - Development Standards (SEPP 1 applications).

Report

In accordance with the NSW Department of Planning and Environment's (DPE) requirement for all SEPP 1 applications to be reported to Council, the attachment to this report provides details of all SEPP 1 applications that were determined within the period stated above.

Further to the above, a copy of the attachment to this report was included in the quarterly report to the DPE and the information is also made available to the public under the SEPP 1 register on Council's website.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: **(Kolkman/Thompson)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Greiss/Kolkman)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 27

That the Officer's Recommendation be adopted.

ATTACHMENT 1

SEPP 1 Variations 1 October to 31 December 2015

Council DA reference number	Lot number	DP number	Apartment/Unit number	Street number	Street name	Suburb/Town	Postcode	Category of development	Environmental planning instrument	Zoning of land	Development standard to be varied	Justification of variation	Extent of variation	Concurring authority	Date DA determined dd/mm/yyyy
3110/2014/DA-I	Lot 21 & 22	DP 599572		7	Badgally Road	CAMPBELLTOWN	2560	12: Industrial	Campbelltown (Urban Area) LEP 2002	4(b) - Industry B Zone	Clause 37 Setbacks within industrial areas	Not inconsistent with nearby setbacks for approved vehicle display areas, minor building encroachment only, SEPP 1 predominantly related to display and storage of cars in setback area, which has a relatively low environmental impact as the area would be behind manicured landscaped area	40%	Council	7/10/2015

3.3 Removal of six trees and construction of a 13 suite boarding house with car parking area and front fencing at No. 18 Rudd Road, Leumeah

Reporting Officer

Acting Manager Development Services

Attachments

1. Recommended conditions (contained with this report)
2. Locality plan (contained within this report)
3. Roof plan (contained within this report)
4. Shadow diagrams (contained within this report)
5. Elevations (contained within this report)
6. Site/Ground floor plan (distributed under separate cover – confidential – for privacy reasons this plan is not available to the public)
7. First floor plan (distributed under separate cover – confidential – for privacy reasons this plan is not available to the public)
8. Landscape plan (distributed under separate cover – confidential – for privacy reasons this plan is not available to the public)
9. Notification plan (distributed under separate cover – confidential – for privacy reasons this plan is not available to the public)

Purpose

To assist Council in its determination of the subject development application in accordance with the provisions of the *Environmental Planning and Assessment Act 1979*.

Property Description	Lot 4 DP 21264 – No. 18 Rudd Road, Leumeah
Application No	932/2015/DA-BH
Applicant	Michael Brown
Owner	Segcon Pty Ltd
Provisions	Campbelltown 2025 Looking Forward
	State Environmental Planning Policy (Affordable Rental Housing) 2009
	State Environmental Planning Policy (Infrastructure) 2007
	Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment
	Campbelltown (Urban Area) Local Environmental Plan 2002
	Campbelltown Local Environmental Plan 2015

	Campbelltown (Sustainable City) Development Control Plan 2014
	Campbelltown City Council Section 94A Development Contributions Plan
Date Received	27 April 2015

Report

Introduction

Development Consent is sought for the removal of six trees and the construction of a 13 suite boarding house with a car parking area and front fencing.

The subject site is an irregular shaped vacant allotment with a total area of approximately 778sqm.

The proposed layout consists of a two storey building containing 13 boarding house suites, each with an ensuite type bathroom and a kitchen. Six of the suites contain laundry facilities while a common laundry services the other suites. The facility also includes a common room, three car parking spaces, motorcycle and bicycle parking. The application details that seven of the suites are to be occupied individually (one being the Boarding House Manager suite), while the remaining six suites can be occupied by up to two people.

1. Vision

Campbelltown 2025 Looking Forward

'Campbelltown 2025 Looking Forward' is a vision statement of broad town planning intent for the longer term future of the City of Campbelltown that:

- responds to what Council understands people want the City of Campbelltown to look, feel and function like
- recognises likely future government policies and social and economic trends
- sets down the foundations for a new town plan that will help achieve that future.

The document establishes a set of strategic directions to guide decision making and development outcomes. These directions are broad in nature and informed the new statutory town plan for the City which commenced on 11 March 2016.

The strategic directions relevant to this application are:

- growing the Regional City
- building a distinctive Campbelltown sense of place
- creating employment and entrepreneurial opportunities.

The proposed development is generally consistent with these directions.

Some of the relevant desired outcomes of the strategic directions included in Campbelltown 2025 include:

- urban environments that are safe, healthy, exhibit a high standard of design, and are environmentally sustainable
- an impression of architecture that engages its environmental context in a sustainable way
- development and land use that matches environmental capacity and capability.

The proposed development has been assessed giving regard to Campbelltown 2025 Looking Forward. It is considered that the Development Application is generally consistent with the Vision's desired outcomes when giving regard to the design and level of impact on adjoining development and the locality.

2. Planning Provisions

The development has been assessed in accordance with the heads of consideration under Section 79C of the *Environmental Planning and Assessment Act 1979*, and having regard to those matters, the following issues have been identified for consideration.

2.1 State Environmental Planning Policy (Affordable Rental Housing) 2009

Clause 3 of the Affordable Rental Housing SEPP, outlines that the Policy aims to:

(a) to provide a consistent planning regime for the provision of affordable rental housing

(b) to facilitate the effective delivery of new affordable rental housing by providing incentives by way of expanded zoning permissibility, floor space ratio bonuses and non-discretionary development standards

(c) to facilitate the retention and mitigate the loss of existing affordable rental housing

(d) to employ a balanced approach between obligations for retaining and mitigating the loss of existing affordable rental housing, and incentives for the development of new affordable rental housing

(e) to facilitate an expanded role for not-for-profit-providers of affordable rental housing

(f) to support local business centres by providing affordable rental housing for workers close to places of work

(g) to facilitate the development of housing for the homeless and other disadvantaged people who may require support services, including group homes and supportive accommodation.

Clause 6 of the Affordable Rental Housing SEPP, outlines that 'affordable housing' means housing for very low income households, low income households or moderate income households, being such households as are prescribed by the regulations or as are provided for in an environmental planning instrument.

When the application was made, the site was zoned '2(b) – Residential', pursuant to Campbelltown (Urban Area) Local Environmental Plan 2002 (LEP 2002) and in accordance with the relevant provisions of the *Environmental Planning Assessment Act 1979,* the application has been assessed having regard to that plan. Notwithstanding this, it is of note that the newly operational Campbelltown Local Environmental Plan 2015 (CLEP 2015) zones the site R2 - Low Density Residential. Given that the '2(b) – Residential' zone of LEP 2002 is equivalent to 'Zone R2 Low Density Residential' and that the site is within an accessible area (as the land is within 800 metres walking distance of a public entrance to a railway station and/or 400 metres walking distance of a bus stop used by a regular bus service), Part 2 Division 3 of the Affordable Rental Housing SEPP applies.

The following compliance table details the assessment of the proposal in accordance with the relevant requirements of Part 2 Division 3 of the Affordable Rental Housing SEPP.

Criteria	**Proposed**	**Compliance**
Clause 29 (1) – Density and Scale A consent authority must not refuse consent to development to which this Division applies, on the grounds of density or scale if the density and scale of the buildings when expressed as a floor space ratio are not more than: (a) the existing maximum floor space ratio for any form of residential accommodation permitted on the land. A maximum floor space ratio of 0.55:1 applies to the subject land pursuant to Section 3.7.1 (a) of the Campbelltown (Sustainable City) Development Control Plan 2014.	0.54:1	Yes

Criteria	Proposed	Compliance
Clause 29 (2) (a) – Building Height A consent authority must not refuse consent to development to which this Division applies, if the building height of all proposed buildings is not more than the maximum building height permitted under another environmental planning instrument for any building on the land.	When the application was made there were no building height limit controls contained within an Environmental Planning Instrument. It is noted that the building height complies with the maximum building height requirement of Clause 4.3(2) of CLEP 2015, which became operational on 11 March 2016.	NA
Clause 29 (2) (b) – Landscaped Area A consent authority must not refuse consent to development to which this Division applies, if the landscape treatment of the front setback area is compatible with the streetscape in which the building is located.	The landscape treatment along both street frontages is compatible with the existing and future likely streetscape of the locality.	Yes
Clause 29 (2) (c) – Solar Access A consent authority must not refuse consent to development to which this Division applies, where the development provides for one or more communal living rooms, if at least one of those rooms receives a minimum of three hours direct sunlight between 9.00am and 3.00pm in mid-winter.	The common room shall receive in excess of three hours direct sunlight during mid-winter.	Yes

Criteria	Proposed	Compliance
Clause 29 (2) (d) – Private Open Space A consent authority must not refuse consent to development to which this Division applies, if at least the following private open space areas are provided (other than the front setback area): (i) one area of at least 20sqm with a minimum dimension of 3m is provided for the use of the lodgers (ii) if accommodation is provided on site for a boarding house manager – one area of at least 8sqm with a minimum dimension of 2.5m is provided adjacent to that accommodation.	The layout includes a common open space area (adjacent to the common room) approximately 27sqm in area and 8.5m wide for the use of all lodgers. Furthermore, while the application does not indicate a specific suite for use by the manager, it is noted that Suite 5 includes a terrace area approximately 11sqm in area and 4m wide.	Yes. Furthermore, a draft condition has been included within the recommended conditions of consent restricting the use of Suite 5 to that of the Boarding House Manager only.
Clause 29 (2) (e) – Parking A consent authority must not refuse consent to development to which this Division applies, if: (i) in the case of development in an accessible area-at least 0.2 parking spaces are provided for each boarding room. Three car parking spaces are required for a 13 suite boarding house.	The layout provides three car parking spaces.	Yes.
Clause 29 (2) (f) – Accommodation Size A consent authority must not refuse consent to development to which this Division applies, if each boarding room has a gross floor area (excluding any area used for the purposes of private kitchen or bathroom facilities) of at least: (i) 12sqm in the case of a boarding room intended to be used by a single lodger, or (ii) 16sqm in any other case.	Each of the single lodger suites has a gross floor area exceeding 12sqm, while each of the two lodger suites has a gross floor area exceeding 16sqm.	Yes
Clause 29 (3) – Kitchen and Bathroom Facilities A boarding house may have private kitchen or bathroom facilities in each boarding room but is not required to have those facilities in any boarding room.	Each suite has private kitchen and bathroom facilities.	Yes
Clause 30 (1) (a) – Communal Living Room A consent authority must not consent to development to which this Division applies, unless if a boarding house has five or more boarding rooms, at least one communal living room will be provided.	The layout includes a common room.	Yes

Criteria	Proposed	Compliance
Clause 30 (1) (b) – Gross Floor Area A consent authority must not consent to development to which this Division applies, unless no boarding room will have a gross floor area (excluding any area used for the purposes of private kitchen or bathroom facilities) of more than 25sqm.	Each suite has a gross floor area of less than 25sqm.	Yes
Clause 30 (1) (c) – Number of Lodgers A consent authority must not consent to development to which this Division applies, unless no boarding room will be occupied by more than two adult lodgers.	The application details that each suite is to be occupied by either one or two lodgers.	Yes. Furthermore, a condition has been included within the recommendation requiring the occupation of the suites by no more than the number of lodgers proposed.
Clause 30 (1) (d) – Bathroom and Kitchen Facilities A consent authority must not consent to development to which this Division applies, unless adequate bathroom and kitchen facilities will be available within the boarding house for the use of each lodger.	Each suite has private bathroom and kitchen facilities, which are considered to be of ample size and substance for the accommodation by up to two lodgers.	Yes
Clause 30 (1) (e) – Boarding House Manager A consent authority must not consent to development to which this Division applies, unless if the boarding house has capacity to accommodate 20 or more lodgers, a boarding room or on site dwelling will be provided for a boarding house manager.	While the application details that the facility is only to provide for the occupation of 19 lodgers, it has been detailed that a boarding room is to be provided for a Boarding House Manager.	NA. Notwithstanding this, a condition has been included within the recommendation requiring Suite 5 being occupied by a Boarding House Manager.
Clause 30 (1) (g) – Residential Space Fronting a Street A consent authority must not consent to development to which this Division applies unless, if the boarding house is on land zoned primarily for commercial purposes, no part of the ground floor of the boarding house that fronts a street will be used for residential purposes unless another environmental planning instrument permits such a use.	The site is not zoned primarily for commercial purposes.	NA

Criteria	Proposed	Compliance
Clause 30 (1) (h) – Bicycle and Motorcycle Parking A consent authority must not consent to development to which this Division applies, unless at least one parking space will be provided for a bicycle and one will be provided for a motorcycle, for every five boarding rooms. Equating to a three bicycle and three motorcycle parking spaces for a 13 suite boarding house.	The layout provides three bicycle and two motorcycle parking spaces.	No. However a condition has been included within the recommendation requiring the provision of three motorcycle parking spaces.
Clause 30A – Character of Local Area A consent authority must not consent to development to which this Division applies unless it has taken into consideration whether the design of the development is compatible with the character of the local area.	The overall building design is compatible with the existing and future likely streetscape of the locality.	Yes

2.2 State Environmental Planning Policy (Infrastructure) 2007

The following compliance table, details the assessment of the proposal in accordance with the relevant requirements of the Infrastructure SEPP.

Clause	Control	Requirement	Proposed	Compliance
101 (2) (a)	Development with Frontage to Classified Road	The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that where practicable, vehicular access to the land is provided by a road other than the classified road.	The layout provides vehicular access via the non-classified road frontage.	Yes
101 (2) (b) (i)	Development with Frontage to Classified Road	The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that, the safety, efficiency and ongoing operation of the classified road, will not be adversely affected by the development as a result of the design of the vehicular access to the land.	The layout provides vehicular access via the non-classified road frontage.	NA
101 (2) (b) (ii)	Development with Frontage to Classified Road	The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that, the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of, the emission of smoke or dust from the development.	Smoke and dust emissions from the development are unlikely to be more than extremely minimal.	Yes

Clause	Control	Requirement	Proposed	Compliance
101 (2) (b) (iii)	Development with Frontage to Classified Road	The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that, the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of, the nature, volume or frequency of vehicles using the classified road to gain access to the land.	The layout provides vehicular access via the non-classified road frontage.	NA
101 (2) (c)	Development with Frontage to Classified Road	The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that, the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.	The design includes the provision of acoustically treated windows and substantial landscaping along the Rudd Road frontage. It is considered that such will ameliorate traffic noise and emission impacts from the adjacent classified road.	Yes

2.3 Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment

The proposal does not conflict with any of the relevant provisions of Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment, and is therefore considered acceptable in this regard.

2.4 Campbelltown (Urban Area) Local Environmental Plan 2002

The subject site was zoned '2(b) – Residential' under the provisions of Campbelltown (Urban Area) Local Environmental Plan 2002 (LEP 2002) when the application was made. The proposed development was defined as a 'Boarding-house', which was permissible in the zone. The proposed development was also found to be consistent with the following objectives of the '2(b) – Residential' zone:

(b) to permit the development of a range of housing types, and

(c) to encourage a variety of forms of housing that are higher in density than traditional dwelling houses, including accommodation for older people and people with disabilities, in locations which are accessible to public transport, employment, retail, commercial and service facilities.

Consequently the proposal was deemed to satisfy the provisions of Clause 9 of LEP 2002 at the time of the lodgement of the application.

In accordance with the *Environmental Planning and Assessment Act 1979,* despite the CLEP 2015 being the current planning document at the time of reporting to the Council, LEP 2002 is the relevant document for the purposes of assessing this application.

2.5 Campbelltown Local Environmental Plan 2015

Although CLEP 2015 does not generally apply to this development application, the application has been assessed against the relevant provisions of that plan. In this regard, the subject site is zoned 'R2 – Low Density Residential' under the provisions of CLEP 2015. The proposed development is defined as 'Boarding houses', which are not only permissible, but are consistent with the following objectives of the 'R2 – Low Density Residential' zone:

- to provide for the housing needs of the community within a low density residential environment

- to minimise overshadowing and ensure a desired level of solar access to all properties.

Consequently the proposal is deemed to satisfy the provisions of Part 2 of CLEP 2015.

The following compliance table, details the assessment of the proposal in accordance with the relevant requirements of CLEP 2015.

Clause	Control	Requirement	Proposed	Compliance
4.3 (2)	Height of Buildings Map	Maximum building height of 8.5m.	Approximately 7.1m	Yes
4.4 (2)	Floor Space Ratio Map	The floor space ratio land is not to exceed the floor space ratio, shown for the land on the Floor Space Ratio Map.	The Floor Space Ratio Map does not apply to the subject site.	NA

Clause	Control	Requirement	Proposed	Compliance
7.1 (3)	Earthworks	In deciding whether to grant development consent for earthworks (or for development involving ancillary earthworks), the consent authority must consider the following matters: (a) the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development (b) the effect of the development on the likely future use or redevelopment of the land (c) the quality of the fill or the soil to be excavated, or both (d) the effect of the development on the existing and likely amenity of adjoining properties (e) the source of any fill material and the destination of any excavated material (f) the likelihood of disturbing relics, (g) the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area (h) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	It is considered that the proposed ancillary earthworks are consistent with these matters.	Yes
7.10	Essential Services	Development consent must not be granted to development unless the consent authority is satisfied that any of the following services that are essential for the development are available or that adequate arrangements have been made to make them available when required: (a) the supply of water (b) the supply of electricity (c) the disposal and management of sewage (d) stormwater drainage or on-site conservation (e) suitable road and vehicular access (f) telecommunication services (g) the supply of natural gas.	All relevant services are available to the locality.	Yes. Conditions have been included within the recommendation to satisfy this provision.

2.6 Campbelltown (Sustainable City) Development Control Plan 2014

The following compliance table, details the assessment of the proposal in accordance with the relevant requirements of the Campbelltown (Sustainable City) Development Control Plan 2014.

Given the orientation and positioning of the dwellings on the two adjoining sites, it is considered that the eastern and southern boundaries of the subject site are both side boundaries (therefore none of the property boundaries are considered to be a rear boundary).

Section	Control	Requirement	Proposed	Compliance
2.4.1	Rain Water Tanks	A 5,000L rainwater tank is to be provided for new buildings containing a roof area of between 201sqm and 1,000sqm.	A 3,000L underground rainwater tank.	No. However, a condition has been included within the recommendation requiring the provision of a 5,000L rainwater tank.
2.5 (a)	Landscaping	Landscape design shall enhance the visual character of the development and complement the design / use of spaces within and adjacent to the site.	The overall landscape design shall enhance the visual character of the locality.	Yes
2.5 (b)	Landscaping	Landscape design shall retain and enhance the existing indigenous flora and fauna characteristics of a site wherever possible.	While the proposal involves the removal of six trees, it is considered that the overall landscape design which includes replacement trees shall enhance the indigenous flora and fauna characteristics of the site.	Yes
2.5 (c)	Landscaping	Landscape design shall add value to the quality and character of the streetscape.	The overall landscape design shall enhance the visual character of the streetscape.	Yes
2.5 (e)	Landscaping	The Landscape Concept Plan shall illustrate mature height, spread of species, trees to be removed / retained and shall be prepared by a suitably qualified person.	A detailed Landscape Concept Plan has been provided which was prepared by a Landscape Design Consultancy.	Yes

Section	Control	Requirement	Proposed	Compliance
2.5 (f)	Landscaping	Landscaping shall maximise the use of locally indigenous and other drought tolerant native plants and avoid the use of invasive species.	The overall landscape design maximises the use of locally indigenous plantings.	Yes
2.7	Erosion and Sediment Control	An Erosion and Sediment Control Plan shall be provided, when construction and/or activities involving the disturbance of the land surface are involved.	A detailed Erosion and Sediment Control Plan has been provided.	Yes. A condition has been included within the recommendation requiring compliance with this provision.
2.8.1 (a)	Cut and Fill	A Cut and Fill Management Plan shall be provided, where the development incorporates cut and/or fill operations.	The layout maintains existing ground levels outside of the footprint of both dwellings.	NA
2.15.1	Waste Management	A detailed Waste Management Plan shall accompany multi dwelling applications.	A detailed Waste Management Plan accompanied the application.	Yes
3.3.1 (a)	Streetscape	Building design (including facade treatment, massing, roof design and entrance features), setbacks and landscaping shall complement the scale of development, character and qualities of the desired streetscape.	The overall building design is in keeping with the existing and future likely character of the area.	Yes
3.3.1 (b)	Streetscape	Development on corner sites shall incorporate facade treatments that address both street frontages and achieve positive articulation in building design.	The overall design includes facade treatments and articulation along both street frontage facades.	Yes
3.3.1 (c)	Streetscape	The built form shall relate to the natural landform and setting.	The overall layout relates to the existing ground levels of the site.	Yes
3.3.1 (d)	Streetscape	On-site parking areas shall be designed and sited to reduce the visual prominence of garage doors and external parking spaces as viewed from the street or other public place.	On-site parking is provided in an open manner, to the rear of the building behind landscaped areas.	Yes

Section	Control	Requirement	Proposed	Compliance
3.3.1 (e)	Streetscape	Garage doors facing a public street shall be no wider that 50% of the width of the building (at its street fronting facade).	The development does not include any garages.	NA
3.3.1 (f)	Streetscape	No carports or garages (or like structures) shall be located within 6m of the primary street boundary.	The development does not include any carports or garages.	NA
3.3.1 (g)	Streetscape	No bathroom, ensuite, toilet or laundry windows shall face the primary street of an allotment.	No bathroom, ensuite, toilet or laundry window is contained within either street facing facade.	Yes
3.3.2 (a) (i)	Building Height	Residential development shall not exceed two storeys.	The building is two storeys in height.	Yes
3.3.2 (a) (ii)	Building Height	Residential development shall have a height not exceeding 7.2m at the upper most ceiling measured vertically from ground level (existing).	5.3m	Yes
3.3.2 (a) (iii)	Building Height	Residential development shall have a height not exceeding 9.5m at the upper most roof height measured vertically from ground level (existing).	7.1m	Yes
3.3.2 (b)	Building Height	The height of development shall not result in any significant loss of amenity (including loss of solar access and visual and acoustic privacy) to adjacent properties and public places.	The overall building height is consistent with the height of surrounding developments, and given the orientation of the site and the layout of the dwellings, amenity impacts to adjacent properties is minimal.	Yes
3.3.3 (c)	Fencing	Front residential fencing shall be a maximum of 1.2m in height and complement the design of the development.	The front fencing is 1.2m high and is palisade type with masonry columns.	Yes

Section	Control	Requirement	Proposed	Compliance
3.3.3 (d)	Fencing	Fencing on corner allotments shall not obstruct the sight distance of traffic entering or within, an intersection or roundabout.	The fencing layout does not obstruct the sight distance of road users.	Yes
3.3.3 (e)	Fencing	Fencing shall not obstruct power, water, sewer, gas or telephone services, drainage systems, (including overland flow paths) or any easements or rights of way.	The fencing layout does not obstruct power, water, sewer, gas or telephone services, drainage systems, any easement, or the like.	Yes
3.4 (a)	Car Parking and Access	The minimum dimensions of any required parking space shall be 2.5m x 5.5m. If the car parking space adjoins a 100mm vertical edge, the minimum width shall be 2.7m.	All three car parking spaces have dimensions of 2.5m x 5.5m.	Yes
3.4 (b)	Car Parking and Access	The minimum internal dimension of an enclosed garage shall be 3m x 6m.	The development does not include any garages.	NA
3.4 (c)	Car Parking and Access	Transitional grades shall comply with AS 2890.1 (as amended) Parking Facilities - Off-Street Car Parking.	The layout involves minimal level changes.	Yes. A condition has been included within the recommendation requiring compliance with this provision.
3.4 (e)	Car Parking and Access	Driveways greater than 30m in length as viewed from the street shall be avoided.	The driveway is approximately 18.57m in length.	Yes
3.4 (f)	Car Parking and Access	Driveways shall be located a minimum distance of 6m from the tangent point of any un-signalled intersection.	The driveway is located approximately 18m from the Rudd Road – Kingsclare Street intersection.	Yes
3.4 (j)	Car Parking and Access	Driveways shall be designed perpendicular to the road.	The driveway is perpendicular to the road.	Yes
3.4 (k)	Car Parking and Access	Plain concrete driveways shall not be permitted.	The driveway is of an exposed aggregate concrete finish.	Yes

Section	Control	Requirement	Proposed	Compliance
3.5.2 (a)	Visual Privacy	No window of a habitable room or balcony shall directly face a window of another habitable room, balcony or private open space of another dwelling located within 6m of the proposed window or balcony unless appropriately screened.	The layout minimises the number of windows facing the adjoining residential properties.	Yes
3.6 (a)	Solar Access	Living areas shall have a northerly orientation.	The limited northerly orientation of the site has been utilised where possible.	Yes
3.6 (b)	Solar Access	A minimum 20sqm fixed area of the required private open space shall receive three hours of continuous direct solar access on 21 June, between 9.00am and 3.00pm, when measured at ground level.	In excess of 20sqm of the communal open space area, shall receive more than three hours of solar access at the winter solstice.	Yes
3.6 (c)	Solar Access	Development shall have appropriate regard to the impact on solar access to useable private open space, solar collectors and clothes drying areas of adjoining residential development.	The layout and design of the development results in amenity impacts to adjacent dwellings being minimised.	Yes
3.6 (d)	Solar Access	Building siting shall take into consideration the range of factors that impact on solar access including slope of land, vegetation and existing building and other structures.	The layout and design of the development has taken consideration into topography, vegetation and existing structures.	Yes
3.9.1 (h) (i)	Site and Density Requirements for Multi Dwellings	A multi dwelling development shall be setback a minimum of 5.5m from the primary street boundary.	5.5m	Yes
3.9.1 (h) (ii)	Site and Density Requirements for Multi Dwellings	A multi dwelling development shall be setback a minimum of 3m from the secondary street boundary.	3m	Yes

Section	Control	Requirement	Proposed	Compliance
3.9.1 (h) (iii)	Site and Density Requirements for Multi Dwellings	A multi dwelling development shall be setback a minimum of 900mm from any side boundary for the ground level.	The layout provides setbacks of 1.53m to the eastern side boundary and 6m to the southern boundary.	Yes
3.9.1 (h) (iv)	Site and Density Requirements for Multi Dwellings	A multi dwelling development shall be setback a minimum of 1.5m from any side boundary for all levels above the ground level.	The layout provides first floor setbacks of 1.53m to the eastern side boundary and 6.7m to the southern boundary.	Yes
3.9.2 (d)	General Requirements for Multi Dwellings	No visitor car parking space shall be located forward of the primary or secondary street boundary.	The car parking spaces are not located forward of either the primary or secondary street setbacks.	Yes
3.9.2 (e)	General Requirements for Multi Dwellings	No visitor car parking space shall be in a 'stacked' configuration.	None of the car parking spaces are of a 'stacked' configuration.	Yes
3.9.2 (f)	General Requirements for Multi Dwellings	Unless Council can be satisfied that an existing dwelling located on the site makes a positive contribution to the character of the streetscape, that dwelling shall be demolished.	The site is clear of any buildings.	NA

Section	Control	Requirement	Proposed	Compliance
3.9.2 (i)	General Requirements for Multi Dwellings	No part of an outdoor living area is permitted to be located within the primary or secondary street setback area.	The layout includes the provision of individual terrace areas for each of the ground floor suites, five of which are located within either the primary or secondary street setback area.	No. However it is noted that the areas are relatively open (i.e. located behind open style fencing), are softened by substantial landscaping, provide for good passive surveillance of the street and provide a significant amenity improvement for residents. Accordingly, it is considered that subject to the deletion of privacy type screening running perpendicular to the street, that the proposal would be acceptable and a draft condition to this effect has been included within the recommendation.
3.9.2 (j) (i)	General Requirements for Multi Dwellings	Any communal open space or recreation facility provided as a part of a development shall be designed and constructed to ensure safe access by the occupants of the development.	The layout of the common open space area provides for access to be completed to a safe standard.	Yes
3.9.2 (j) (ii)	General Requirements for Multi Dwellings	Any communal open space or recreation facility provided as a part of a development shall be designed and constructed to prevent access by members of the public.	The common open space area is located behind the building with access being through the common room or gates.	Yes

Section	Control	Requirement	Proposed	Compliance
3.9.2 (j) (iii)	General Requirements for Multi Dwellings	Any communal open space or recreation facility provided as a part of a development shall be designed and constructed to provide for the safety and well-being of children in accordance with any applicable Australian Standard.	The layout of the common open space area provides for such to be completed to a safe standard.	Yes
3.9.2 (k)	General Requirements for Multi Dwellings	Multi dwellings shall satisfy the following additional provisions relating to streetscape: • architectural features (such as balconies, openings, columns, porches, colours, materials etc.) and articulation in walls are to be incorporated into the front facade of each dwelling • no more than 30% of the area forward of any building alignment shall be surfaced with impervious materials.	Both facades addressing the street are articulated, and consist of architectural features that are similar to adjoining and likely future developments. While approximately 15% of the area forward of the building alignment to Rudd Road, is of an impervious finish and approximately 38% of the area forward of the building alignment to Kingsclare Street.	Yes. Each façade is acceptable. No. However, given that the driveway and paths are softened by substantial landscaping and are of minimum width, it is considered that the proposal is acceptable in this instance.
3.9.2 (l)	General Requirements for Multi Dwellings	Multi dwellings shall satisfy the following requirements relating to landscape: • a detailed landscape design plan shall be submitted by a suitably qualified person with the development application • a minimum of 20% of the total site area shall be available for deep soil planting.	The application was accompanied by a detailed landscape design plan. While approximately 31% of the site has been made available for deep soil planting.	Yes

Section	Control	Requirement	Proposed	Compliance
3.9.2 (m)	General Requirements for Multi Dwellings	Multi dwellings shall satisfy the following architectural requirements: • a distinctive architectural outcome that unifies the range of building elements and diversity within the development and which also harmonises with surrounding development • incorporation of variations in roof heights and wall planes to avoid long unbroken ridge lines • incorporation of facade shifts and articulation, varied materials and colours in order to avoid duplication of the same building elements • provision of windows and active spaces in the building ends, to provide additional security and visual interest.	The overall design of the proposed development is similar in terms of its finish, bulk and scale, to existing and likely future developments in the locality. While the proposed dwelling is articulated and consists of architectural features that are of a similar to adjoining and likely future developments.	Yes
3.9.2 (n)	General Requirements for Multi Dwellings	Multi dwellings shall not incorporate vehicular access that utilises any gate structure / mechanism other than access to basement car parking.	The driveway is clear of any gates or other mechanism restricting access.	Yes

2.7 Campbelltown City Council Section 94A Development Contributions Plan

Development contributions are not applicable for boarding house type developments, pursuant to the provisions of Section 94E of the *Environmental Planning and Assessment Act 1979*.

3. Planning Assessment

Built form – The overall building design consists of articulated facades, and is in keeping with the existing and future likely character of the area. Moreover, it is considered that the overall development is of an acceptable built form, in terms of scale, massing, materials and finishes.

Amenity – The overall layout and design, minimises overshadowing and privacy impacts upon surrounding dwellings. It is also considered that the design provides an acceptable level of amenity for future occupants.

Natural Environment – While the trees proposed for removal are not of any high ecological value, it is considered appropriate to require the provision replacement trees. It is proposed to implement a detailed landscaping scheme which includes eight trees on the site, plus street trees. It is noted that the landscaping scheme includes a substantial level of locally indigenous species.

Security and safety – The overall design of the proposed development is considered to be consistent with the principles for minimising crime risk (Crime Prevention through Environmental Design) and it is therefore deemed to be satisfactory in this regard.

Waste - The design provides adequate on-site bin storage space within a designated bin storage enclosure. Adequate kerb side space is provided along Kingslcare Street either side of the driveway for bin collection, which shall not unreasonably impact upon the flow of traffic in the locality.

Consultation – The application was referred to Council's Senior Development Engineer, Council's Environmental Health Officer, Council's Senior Waste Management Officer, Council's Building Certification Unit and Council's Developer Contributions Officer for comment. No objections were raised, subject to the inclusion of conditions, which have been included within the recommendation.

Council's Coordinator Traffic and Roads Design, who raised concerns regarding two of the proposed street trees. Accordingly, a condition has been included within the recommendation requiring the deletion of these two trees from the proposed landscape plan.

4. Public Participation

In accordance with the requirements of Part 9 of the Campbelltown (Sustainable City) Development Control Plan 2014, the application was notified and publicly exhibited. Two submissions were received, both objecting to the proposal. The submissions raised the following concerns:

Insufficient car parking – As previously outlined, while the proposal does not satisfy the visitor car parking requirements of the Sustainable City Development Control Plan, it does however satisfy the car parking requirements of Clause 14 (2) (a) (ii) of the Affordable Rental Housing SEPP. Council cannot refuse the development application on these grounds.

Impact upon traffic in the locality – Whilst it is acknowledged that the proposal would generate additional traffic movements, it is considered that local road network is capable of meeting the associated demand. Furthermore, the application was referred to Council's Senior Development Engineer for consideration, who raised no objections to the proposal. While as previously outlined a condition has been included within the recommendation requiring the deletion of two proposed trees street trees, as requested by Council's Coordinator Traffic and Roads Design to ensure safe sight distances for drivers and pedestrians.

Occupation of the facility by undesirables – This is not a matter for consideration pursuant to the *Environmental Planning and Assessment Act 1979*. Notwithstanding this, 'Resident House Rules' have been provided as part of the application and a condition has been included within the recommendation requiring compliance with such.

Proliferation of boarding houses across the Campbelltown Local Government Area – Whilst it is acknowledged that there are several existing boarding house facilities within the Campbelltown Local Government Area, there are no such controls restricting the number of facilities in a given area.

Impact upon property values in the locality – No evidence has been provided in support of this claim and is not a matter for consideration pursuant to the *Environmental Planning and Assessment Act 1979*. Furthermore, the relevant provisions provide for boarding house type developments within the '2(b) – Residential' zone under LEP 2002 and within the 'R2 - Low Density Residential' zone under CLEP 2015.

5. Conclusion

The development application has been assessed pursuant to the relevant provisions of the Affordable Rental Housing SEPP 2009, LEP 2002, CLEP 2015 and the Sustainable City DCP 2014.

The proposed development is permissible within both the '2(b) – Residential' zone under LEP 2002 and the 'R2 - Low Density Residential' zone under CLEP 2015. A detailed assessment of the overall merit of the proposal, considering matters including, the built form, amenity impacts, the natural environment, Crime Prevention through Environmental Design Principles and waste disposal matters did not identify any unreasonable environmental or social impacts.

A number of concerns were raised as part of the notification/public exhibition process and consideration of the concerns raised (which included insufficient car parking and the proliferation of boarding houses), it was found that the proposal complied with the associated relevant provisions (including that of the Affordable Rental Housing SEPP 2009)

Accordingly, and having regard to the development proximity to services and the proposals general compliance with Council's policies, it is considered that the site is suitable for the proposed development and the development is worthy of approval, subject to the recommended draft conditions shown as attachment 1.

Officer's Recommendation

That development application 932/2015/DA-BH, for the removal of six trees and construction of a 13 suite boarding house with a car parking area and front fencing at No. 18 Rudd Road Leumeah, be approved subject to the recommended conditions of consent outlined in attachment 1 of this report.

Committee's Recommendation: **(Kolkman/Rowell)**

That development application 932/2015/DA-BH, for the removal of six trees and construction of a 13 suite boarding house with a car parking area and front fencing at No. 18 Rudd Road Leumeah, be approved subject to the recommended conditions of consent outlined in attachment 1 of this report being amended to include acoustic treatment being applied to all windows located along the Kingsclare Street side of the development also.

CARRIED

Voting for the Committee's Recommendation were Councillors: Greiss, Kolkman, Rowell and Thompson.

Voting against the Committee's Recommendation were Councillors: Lound and Oates.

Council Meeting 22 March 2016 **(Greiss/Kolkman)**

That development application 932/2015/DA-BH, for the removal of six trees and construction of a 13 suite boarding house with a car parking area and front fencing at No. 18 Rudd Road Leumeah, be approved subject to the recommended conditions of consent outlined in attachment 1 of this report being amended to include acoustic treatment being applied to all windows located along the Kingsclare Street side of the development also.

Council Resolution Minute Number 30

That development application 932/2015/DA-BH, for the removal of six trees and construction of a 13 suite boarding house with a car parking area and front fencing at No. 18 Rudd Road Leumeah, be approved subject to the recommended conditions of consent outlined in attachment 1 of this report being amended to include acoustic treatment being applied to all windows located along the Kingsclare Street side of the development also.

Voting for the Council Resolution were Councillors: Greiss, Hawker, Kolkman, Lake, Matheson, Mead, Rowell and Thompson.

Voting against the Council Resolution were Councillors: Borg, Brticevic, Chanthivong, Dobson, Glynn, Lound and Oates.

ATTACHMENT 1

Recommended Conditions of Consent

GENERAL CONDITIONS

The following conditions have been applied to ensure that the use of the land and/or building is carried out in such a manner that is consistent with the aims and objectives of the planning instrument affecting the land.

For the purpose of these conditions, the term 'applicant' means any person who has the authority to act on or benefit of the development consent.

1. Approved Development

The development shall be carried out in accordance with the approved plans and documents listed in the table below, and all associated documentation supporting this consent, except as modified in red by Council and / or any conditions within.

Drawing No.	Issue	Prepared by	Date
DA_1001	L	Moderinn Pty Ltd	7 December 2015
DA_1002	I	Moderinn Pty Ltd	27 November 2015
DA_1003	I	Moderinn Pty Ltd	27 November 2015
DA_1011	A	Moderinn Pty Ltd	27 November 2015
DA_2000	J	Moderinn Py Ltd	27 November 2015
DA_3001	G	Moderinn Pty Ltd	27 November 2015

2. Amended Plans

The development is to incorporate the following amendments and amended plans submitted to the Principal Certifying Authority for approval, prior to the issuing of a Construction Certificate:

- the privacy type screening around the terrace and balcony areas are to be deleted
- provision of three motorcycle parking spaces
- the two northern most street trees are to be deleted.

3. Construction Certificate

Prior to the commencement of any works that require a construction certificate:

a. the applicant shall obtain a construction certificate for the particular works
b. the applicant shall appoint a principal certifying authority and
c. the private certifying authority shall notify Council of their appointment no less than two days prior to the commencement of any works.

4. Building Code of Australia

All building work must be carried out in accordance with the provisions of the Building Code of Australia. In this clause, a reference to the Building Code of Australia is a reference to that Code as in force on the date the application for the relevant construction certificate is made.

5. Contract of Insurance (residential building work)

In the case of residential building work for which the *Home Building Act 1989* requires there to be a contract of insurance in force in accordance with Part 6 of that Act, that such a contract of insurance is in force before any building work authorised to be carried out by the consent commences.

This clause does not apply:

a. To the extent to which an exemption is in force under Clause 187 or 188 of the Environmental Planning and Assessment Regulation 2000, subject to the terms of any condition or requirement referred to in Clause 187(6) or 188(4) of that regulation, or

b. To the erection of a temporary building.

6. Notification of *Home Building Act 1989* Requirements

Residential building work within the meaning of the *Home Building Act 1989* must not be carried out unless the principal certifying authority for the development to which the work relates (not being Council) has given Council written notice of the following information:

a. In the case of work for which a principal contractor is required to be appointed:

   i. the name and licence number of the principal contractor, and
   ii. the name of the insurer by which the work is insured under Part 6 of that Act.

b. In the case of work to be done by an owner-builder:

   i. the name of the owner-builder, and
   ii. if the owner-builder is required to hold an owner-builder permit under that Act, the number of the owner-builder permit.

If arrangements for doing the residential building work are changed while the work is in progress so that the information notified becomes out of date, further work must not be carried out unless the principal certifying authority for the development to which the work relates (not being Council) has given Council written notification of the updated information.

7. Vehicular Access to and from the Site

All vehicular entries and exits, to and from the site, shall be made in a forward direction. A sign shall be placed within the car parking area, advising drivers of this information.

8. Ground Levels

The existing ground levels shall only be altered in accordance with the levels shown on the approved plans. Under no circumstances shall levels elsewhere on the site be altered in any way.

9. Landscaping

a. The provision and maintenance of landscaping shall be in accordance with the approved landscape plan, prepared by Conzept Landscape Architects, submitted to Council on 7 December 2015, including the engagement of a suitably qualified landscape consultant / contractor for landscaping works.

b. All plants shall be vigorous and well established, free from disease and pests, of good form, consistent with species or variety, hardened off, not soft or forced, with large healthy root systems with no evidence of root curl, restriction or damage.

c. All trees are to be staked and tied with a minimum of three hardwood stakes. Ties are to be hessian and fixed firmly to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant.

d. Root deflection barriers having a minimum depth of 600mm are to be installed adjacent to all footpaths and driveways.

e. Minimum 75mm depth of organic mulch shall be placed within an area 500mm radius from the base of trees. Mulch shall be free from deleterious and extraneous matter, including soil, weeds, rocks, twigs and the like and shall be placed so that it is not in contact with the stem of the plant.

f. The landscaping is to be maintained to a high level at all times in this regard the owner shall engage the services of a landscape maintenance contractor to maintain the landscaping of the site at all times. Any vegetation that dies should be replaced in accordance with the approved landscape plan.

10. External Finishes

The external finishes shall be in accordance with the approved plans and the schedule of finishes submitted to Council on 15 September 2015. Any proposed alterations to these finishes are considered to be a modification to the development consent and require separate approval by Council.

11. Fencing

All fencing shall be erected in accordance with the approved fence plan at the sole cost of the developer. 'Colorbond' style metal fences that face a public space are not permitted.

12. Switchboards/Utilities/Air Conditioning Units

Switchboards, air conditioning units, garbage storage areas and storage for other utilities shall not be attached to the front elevations of the building or side elevations that can be seen from a public place.

13. Driveway

The gradients of driveways and manoeuvring areas shall be designed in accordance with Australian Standards AS 2890.1, AS 2890.6 and Campbelltown (Sustainable City) DCP - Volume 3 (as amended).

The driveways shall be constructed using decorative paving materials such as pattern stencilled concrete, coloured stamped concrete or paving bricks. The finishes of the paving surfaces are to be non-slip and plain concrete is not acceptable.

The driveway shall be separated from the landscaped areas by a 150mm high kerb.

14. Lighting

Illumination of the site is to be arranged to provide an appropriate level of lighting and in accordance with the requirements of Australian Standard 4282 (as amended) so as not to impact upon the amenity of the occupants of adjoining and nearby residential premises or traffic.

A lighting maintenance policy is to be established for the development detailing the use of lighting internally and externally to ensure that lighting meets the required standards to enhance surveillance opportunities during hours of darkness and the safety of staff and lodgers.

15. Rudd Road Site Boundary

All buildings and structures together with any improvements integral to the future use of the site are to be wholly within the freehold property (unlimited in height and depth), along the Rudd Road boundary.

16. Engineering Design Works

The design of all engineering works shall be carried out in accordance with the requirements set out in the Campbelltown (Sustainable City) DCP - Volumes 1 and 3 (as amended).

17. Footpaths and Pram Ramps

1.2m wide footpaths shall be constructed along the full site frontage on Kingsclare Street. The configuration of the proposed footpaths shall be in accordance with the approved plans. All footpaths shall be a minimum of 1.2 metres clear from the site boundary and kerb and gutter. Two pram ramps shall be constructed on both sides of the Kingsclare Street. Design plans are to be provided to and approved by Council's Manager Development Services prior to the issue of the Construction Certificate.

18. Car Parking Spaces

Three car parking spaces shall be designed, sealed, line marked and made available to all users of the site in accordance with Australian Standards 2890 1 and 2 (as amended).

19. Motorcycle Parking

Three motorcycle parking spaces shall be designed, sealed, line marked and made available to all uses of the site in accordance with any relevant Australian Standard.

20. Rubbish, Recycling and Organic Bins

a. A total of 12 bins are to be maintained on site. Six rubbish bins and six recycling bins. Each of the bins are to be 240L in size and are to be stored within the communal bin storage area. Any proposed alterations to these bin numbers will be considered to be a modification to the development consent and requires the separate approval of Council. Under no circumstances are any bins to be stored within vehicle parking, vehicle manoeuvring areas or landscaped areas.

b. The communal bin storage area is to be provided with a hose connection for cleaning purposes and a floor waste connected to the sewer system.

c. All bins are to be presented kerbside for collection by the Boarding House Manager, no earlier than 6.00pm on the evening prior to scheduled collection and returned directly to the communal bin storage area within four hours of collection.

21. Shoring and Adequacy of Adjoining Property

If the development referred to in this development consent involves an excavation that extends below the level of the base of the footings of a building on adjoining land, the person having the benefit of the development consent must at the person's own expense:

a. protect and support the adjoining premises from possible damage from the excavation, and
b. where necessary, underpin the adjoining premises to prevent any such damage.

This condition does not apply if the person having the benefit of the development consent owns the adjoining land or the owner of the adjoining land has given consent in writing to that condition not applying.

22. Rain Water Tank

A 5,000L underground rainwater tank shall be installed on site for the collection and storage of stormwater for irrigation and reuse purposes, in accordance with the approved plans.

23. Boarding House Rules

a. The Boarding House Rules submitted to Council on 27 November 2015 are to be displayed in a prominent common position.

b. The owner of the premises must ensure that the Boarding House Rules are enforced and complied with at all times.

24. Sleeping Accommodation

The owner of the premises must not allow any specific suite to be used for the purposes of sleeping accommodation by any more than the following number of people.

Suite Number	Maximum Number of People
1	1
2	2
3	1
4	1
5	1 – Restricted to the Boarding House Manager only
6	1
7	1
8	1
9	2
10	2
11	2
12	2
13	2

25. Sleeping Accommodation

The occupier of the premises must not allow any room or cubicle in the premises to be used for the purposes of sleeping accommodation unless the room or cubicle has a floor area of 5.5sqm or more for each person sleeping in it (in the case of long-term sleeping accommodation) or 2.0sqm or more for each person sleeping in it (in any other case) (Public Health Regulation 2012).

26. Acts and Regulations

The boarding house must comply (where relevant) with the following Acts and Regulations:

Public Health Act 2010
Public Health Regulation 2012

Boarding Houses Act 2012
Boarding Houses Regulation 2013
Local Government Act 1993
Local Government (General) Regulation 2005
Protection of the Environment (Noise Control) Regulation 2008

27. Unreasonable Noise

The development, including operation of vehicles, shall be conducted so as to avoid the generation of unreasonable noise and cause no interference to adjoining or nearby occupants.

Noise from plant rooms associated with the development shall not exceed the values contained within the Protection of the Environment Operations (Noise Control) Regulation 2008.

The applicant shall place signs in the vehicle car parking and outdoor recreation areas that contain wording to the effect that residents and visitors are requested to refrain from making noise after 9.00pm.

28. Graffiti Removal

In accordance with the environmental maintenance objectives of 'Crime Prevention Through Environmental Design', the owner/lessee of the building shall be responsible for the removal of any graffiti which appears on the buildings, fences, signs and other surfaces of the property within 48 hours of its application.

29. Registration

The boarding house is to be registered on the Fair Trading boarding house register within 28 days of opening.

30. Council Inspection

The applicant/owner of the boarding house is to contact Council within the first 12 months of operation (but not earlier than nine months) such that an inspection of the boarding house can be carried to ensure compliance with this development consent and any other relevant acts and regulations.

31. Surveillance

Surveillance equipment is to be installed to enhance the physical security of the premises and assist in the identification of people involved in anti-social or criminal behaviour.

Cameras should be installed both within the complex and around to maximise surveillance opportunities. The cameras should monitor areas with poor natural supervision. TV monitors should enable staff to monitor activities on the camera. Recording equipment should be installed away from areas accessible to the public to avoid tampering. Once installed, staff should be trained in the operating procedures of the equipment. Any surveillance system should be manufactured and installed by a qualified and reputable company and regularly function tested. All surveillance is to adhere to the *Surveillance and Privacy Act* and is not to infringe on the privacy of any adjoining property.

32. Territorial Reinforcement

Effective signage and/or directional signs must be installed to provide guidance to visitors in locating prohibited areas as well as areas of such interest such as management and communal areas.

Warning signs can assist in controlling activities and movements throughout the premises and grounds. Warning signs are to be installed around the perimeter of the complex to warn intruders of what security treatments have been implemented to reduce opportunities for crime.

33. Environmental Management

Graffiti resistant materials are to be used on fences, the ground floor and areas which are accessible by other structures to reduce graffiti attacks.

A graffiti management plan needs to be incorporated into the plan of management.

34. Space/Activity Management

External seating needs to be of solid construction which is securely fixed to a solid surface and of graffiti and damage resistance material.

35. Access Control

The main entry/exit points for this development should be fitted with single cylinder locksets which comply with the Building Code of Australia.

Windows should be reinforced by applying a shatter resistant film.

Emergency evacuation plans should be implemented and maintained to assist staff and emergency services in the event of an emergency. This plan should be prominently displayed.

Residents are to be trained in evacuation procedures.

36. External Storage of Goods

No external storage of goods, materials or any other items associated with the development shall be permitted to be stored in areas visible from public places at any times except outdoor dining setting, shading devices and barbeques.

PRIOR TO THE ISSUE OF A CONSTRUCTION CERTIFICATE

The following conditions of consent must be complied with prior to the issue of a construction certificate by either Campbelltown City Council or an accredited certifier. All necessary information to comply with the following conditions of consent must be submitted with the application for a construction certificate.

37. Plan of Management

Prior to the Principal Certifying Authority issuing a construction certificate, a Plan of Management shall be provided for the boarding house. The Plan shall be submitted to Council's Manager Development Services for approval. The Plan shall at minimum include the following information:

a. The 24 hour contact details of the manager / caretaker (including phone number and mobile phone number), and measures to make sure this information is available to surrounding residents.

b. Proposed staffing arrangements during the daytime and at night-time.

c. Proposed measures to ameliorate any potential noise or amenity impacts within the building and upon the surrounding locality.

d. Proposed safety and security measures to be employed within the boarding house including prominent display boards within the building of emergency telephone numbers and other essential telephone numbers.

e. Proposed management practices to prevent the use of outdoor common open space areas between 10.00pm and 7.00am.

f. Presentation of waste bins to the kerb for waste collection and bringing waste bins back into the property in a timely manner afterwards, as well as cleaning and maintenance of the waste storage area.

g. The requirement to keep a register of tenants' names and details on-site at all times, available for inspection by public authorities.

h. The requirement to keep a register of complaints on-site at all times, available for inspection by public authorities.

Following notification from Council that the Plan of Management is acceptable, the Plan will form part of the development consent.

38. Utility Servicing Provisions

Prior to Council or an accredited certifier issuing a construction certificate, the applicant shall obtain a letter from both the relevant electricity authority and the relevant telecommunications authority stating that satisfactory arrangements have been made to service the proposed development.

Note: The applicant should also contact the relevant water servicing authority to determine whether the development will affect the authorities water or sewer infrastructure.

39. Geotechnical Report

Prior to Council or an accredited certifier issuing a construction certificate, where proposed excavation and/or filling exceed 900mm in depth, or where the subject site is identified as being filled land, a geotechnical report prepared by a NATA registered laboratory shall be submitted which indicates that the land will not be subject to subsidence, slip, slope failure or erosion.

40. Soil and Water Management Plan

Prior to Council or an accredited certifier issuing a construction certificate, a detailed soil and water management plan shall be submitted for approval.

41. Traffic Committee

Prior to Council or an accredited certifier issuing a construction certificate, the applicant shall submit plans and obtain approval from Council's Local Traffic Committee for the proposed extension to the median in Kingsclare Street, pram ramps, footpaths and other traffic control facilities and all associated line marking and / or sign posting.

42. Traffic Control Plans

Prior to Council or an accredited certifier issuing a construction certificate, the applicant shall prepare and obtain approval from an accredited person, a Traffic Control Plan (TCP) in accordance with the State Roads Authority manual "Traffic Control at Work Sites" and Australian Standard AS 1742.3 (as amended). A copy of the approved TCP shall be kept on site for the duration of the works in accordance with Work Cover Authority requirements. A copy shall be submitted to Council for its records.

43. Stormwater Management Plan (Development)

Prior to Council or an accredited certifier issuing a construction certificate, a plan indicating all engineering details and calculations relevant to the site regrading and the collection and disposal of stormwater from the site, building/s and adjacent catchment, shall be submitted for approval. Floor levels of all buildings shall be a minimum of 150mm above the adjacent finished site levels.

Stormwater shall be conveyed from the site to the existing drainage pit in Rudd Road with approval from RMS and Council. All proposals shall comply with the requirements of RMS and detailed in the Campbelltown (Sustainable City) DCP - Volume 3 (as amended).

44. Dilapidation Report

Prior to Council or an accredited certifier issuing a construction certificate, the applicant shall submit a dilapidation report for all buildings and structures in the vicinity of the subject works and for any other infrastructure that may be affected by the works on the subject site.

45. Work on Public Land

Prior to Council or an accredited certifier issuing a construction certificate, the applicant shall obtain written approval from Council for any proposed work on public land. Inspection of this work shall be undertaken by Council at the applicant's expense and a compliance certificate, approving the works, shall be obtained from Council, prior to the principal certifying authority issuing an occupation certificate.

46. Design for Access and Mobility

Prior to Council or an accredited certifier issuing a Construction Certificate, the applicant shall demonstrate by way of detailed design, compliance with the relevant access requirements of the BCA and AS 1428 – Design for Access and Mobility.

47. Telecommunications Infrastructure

a. If the development is likely to disturb or impact upon telecommunications infrastructure, written confirmation from the service provider that they have agreed to proposed works must be submitted to the Principal Certifying Authority prior to the issue of a Construction Certificate or any works commencing, whichever occurs first; and

b. The arrangements and costs associated with any adjustment to telecommunications infrastructure shall be borne in full by the applicant/developer.

48. Sydney Water

Prior to Council or an accredited certifier issuing a construction certificate, the approved plans must be submitted to Sydney Water via the Sydney Water Tap In service, to determine whether the development will affect any Sydney Water wastewater and water mains, stormwater drains and/or easements, and if any requirements need to be met. An approval receipt will be issued if the building plans have been approved. The approval receipt shall be submitted to the Principal Certifying Authority prior to Council or an accredited certifier issuing a construction certificate.

The Sydney Water Tap In service can be accessed at www.sydneywater.com.au.

49. Clearance to the Services

The proposed vehicular crossing shall be located clear of the existing services such as power pole, street drainage pits, communication pits etc. located on the road reserve to the distances recommended in the specifications of Council and the relevant authorities.

50. Waste Management Plan

Prior to Council or an accredited certifier issuing a construction certificate, the relevant provisions of Council's Waste Management Plan is to be completed to the satisfaction of Council.

PRIOR TO THE COMMENCEMENT OF ANY WORKS

The following conditions of consent have been imposed to ensure that the administration and amenities relating to the proposed development comply with all relevant requirements. These conditions are to be complied with prior to the commencement of any works on site.

51. Roads and Maritime Services Approval

Detailed design plans and hydraulic calculations of any changes to the stormwater drainage system on Rudd Road are to be submitted to the Roads and Maritime Services for approval, prior to the commencement of any works.

Details should be forwarded to:
The Sydney Asset Management
Roads and Maritime Services
PO Box 973 Parramatta CBD 2124

A plan checking fee will be payable and a performance bond may be required before Roads and Maritime's approval is issued. With regard to the Civil Works requirement please contact the Project Engineer, External Works Ph: 8849 2114.

52. Erosion and Sediment Control

Prior to the commencement of any works on the land, adequate/approved erosion and sediment control measures shall be fully installed/implemented.

53. Erection of Construction Sign

Prior to the commencement of any works on the land, a sign/s must be erected in a prominent position on the site:

a. Showing the name of the principal contractor (if any) for any building work and a telephone number on which that person may be contacted outside working hours.

b. Stating that unauthorised entry to the work site is prohibited.

c. Pollution warning sign promoting the protection of waterways (issued by Council with the development consent).

d. Stating the approved construction hours in which all works can occur.

e. Showing the name, address and telephone number of the principal certifying authority for the work.

Any such sign/s is to be maintained while the building work, subdivision work or demolition work is being carried out, but must be removed when the work has been completed.

54. Toilet on Construction Site

Prior to the commencement of any works on the land, toilet facilities are to be provided, at or in the vicinity of the work site on which work involved in the erection or demolition of a building is being carried out, at the rate of one toilet for every 20 persons or part thereof. Each toilet provided must be a standard flushing toilet and be connected to:

a. a public sewer, or

b. if connection to a public sewer is not practicable, to an accredited sewage management facility approved by Council, or

c. if connection to a public sewer or an accredited sewage management facility is not practicable, to some other management facility approved by Council.

55. Trade Waste

Prior to the commencement of any works on the land, a trade waste facility shall be provided on-site to store all waste pending disposal. The facility shall be screened, regularly cleaned and accessible to collection vehicles.

56. Vehicular Access during Construction

Prior to the commencement of any works on the land, a single vehicle/plant access to the site shall be provided, to minimise ground disturbance and prevent the transportation of soil onto any public road system. Single sized aggregate, 40mm or larger placed 150mm deep, extending from the kerb and gutter to the property boundary, shall be provided as a minimum requirement.

57. Public Property

Prior to the commencement of any works on site, the applicant shall advise Council of any damage to property which is controlled by Council which adjoins the site, including kerbs, gutters, footpaths, and the like. Failure to identify existing damage may result in all damage detected after completion of the development being repaired at the applicant's expense.

58. Demolition Works

Demolition works shall be carried out in accordance with the following:

a. Prior to the commencement of any works on the land, a detailed demolition work plan designed in accordance with Clause 1.7.3 of Australian Standard AS 2601-2001 – The Demolition of Structures, prepared by a suitably qualified person with suitable expertise or experience, shall be submitted to and approved by Council and shall include the identification of any hazardous materials, method of demolition, precautions to be employed to minimise any dust nuisance and the disposal methods for hazardous materials.

b. Prior to commencement of any works on the land, the demolition Contractor(s) licence details must be provided to Council.

c. The handling or removal of any asbestos product from the building/site must be carried out by a NSW Work Cover licensed contractor irrespective of the size or nature of the works. Under no circumstances shall any asbestos on site be handled or removed by a non-licensed person. The licensed contractor shall carry out all works in accordance with NSW Work Cover requirements.

d. An appropriate fence preventing public access to the site shall be erected for the duration of demolition works

e. Immediately prior to the commencement of the demolition or handling of any building or structure that contains asbestos, the applicant shall request that the principal certifying authority attend the site to ensure that all appropriate safety measures are in place. The applicant shall also notify the occupants of the adjoining premises and Workcover NSW prior to the commencement of any works.

59. Hoarding / Fence

Prior to the commencement of any works, a hoarding or fence must be erected between the work site and a public place if the work involved in the development is likely to cause pedestrian or vehicular traffic in a public place to be obstructed or rendered inconvenient, or if the building involves the enclosure of a public place in accordance with Work Cover requirements.

The work site must be kept lit between sunset and sunrise if it is likely to be hazardous to persons in the public place.

A separate land use application under Section 68 of the *Local Government Act 1993* shall be submitted to and approved by Council prior to the erection of any hoarding on public land.

60. Fencing

An appropriate fence preventing public access to the site shall be erected for the duration of construction works.

61. Geotechnical Reference

Prior to the commencement of any works, a certificate prepared by the designing structural engineer certifying that the design is in accordance with the geotechnical investigation of the site shall be submitted to the PCA. The designing structural engineer shall also nominate a site classification in accordance with AS2870 – Residential Slabs and Footings.

62. Structural Engineer Details

Prior to the commencement of any works, the submission to the principal certifying authority of all details prepared by a practicing structural engineer.

63. Demolition of Existing Dwelling

Prior to the commencement of any other works, the existing dwelling and all other improvements on the land shall be demolished in accordance with the conditions of this consent.

DEVELOPMENT REQUIREMENTS DURING CONSTRUCTION

The following conditions of consent have been imposed to ensure that the administration and amenities relating to the proposed development comply with all relevant requirements. These conditions are to be complied with during the construction of the development on site.

64. Construction Work Hours

All work on site shall only occur between the following hours:

Monday to Friday	7.00am to 6.00pm
Saturday	8.00am to 1.00pm
Sunday and public holidays	No Work.

65. Erosion and Sediment Control

Erosion and sediment control measures shall be provided and maintained throughout the construction period, in accordance with the requirements of the manual – Soils and Construction (2004) (Bluebook), the approved plans, Council specifications and to the satisfaction of the principal certifying authority. The erosion and sedimentation control devices shall remain in place until the site has been stabilised and revegetated.

Note: On the spot penalties up to $1,500 will be issued for any non-compliance with this requirement without any further notification or warning.

66. Work Zones

All loading, unloading and other activities undertaken during construction shall be accommodated on the development site.

Where it is not practical to load, unload or undertake specific activities on the site during construction, the provision of a 'Work Zone' external to the site may be approved by Council following an application being submitted to Council's Traffic Unit outlining the proposal for the work zone. The application is required to be made prior to the commencement of any works and is to include a suitable 'Traffic / Pedestrian Management and Control Plan' for the area of the work zone that will be affected. All costs of approved traffic / pedestrian control measures, including relevant fees, shall be borne by the applicant.

67. Protection of Existing Trees

All trees that are to be retained are to be protected by fencing, firmly staked within the drip line / canopy of the tree and maintained during the duration of the works. The area within the fencing must not be used for stockpiling of any material, nor for vehicle or pedestrian convenience.

All useable trees and shrubs shall be salvaged for re-use, either in log form, or as woodchip mulch for erosion control or garden beds or site rehabilitation. Non-salvable materials such as roots and stumps shall be disposed of to a waste management centre or other approved form.

68. Dust Nuisance

Measures shall be implemented to minimise wind erosion and dust nuisance in accordance with the requirements of the manual – 'Soils and Construction (2004) (Bluebook). Construction areas shall be treated/ regularly watered to the satisfaction of the principal certifying authority.

69. Certification of Location of Building during Construction

Prior to the positioning of wall panels/ bricks or block work, the applicant shall submit to the principal certifying authority a qualified practicing surveyor's certificate showing the boundaries of the allotment, distances of walls and footings from the boundaries, and the dimensions of the building.

70. Certification of Location of Building upon Completion

Upon completion of the building, the applicant shall submit to the principal certifying authority a qualified practicing surveyors certificate showing the boundaries of the allotment, distances of walls and footings from boundaries.

71. Certification of Levels of Building during Construction

Prior to the placement of any concrete of the basement/ground floor slab, the applicant shall submit to the principal certifying authority a qualified practicing surveyor's certificate showing that the formwork levels are in accordance with the approved plan.

72. Termite Control

The building shall be protected from subterranean termites in accordance with Australian Standard 3660.1. Certification of the treatment shall be submitted to the principal certifying authority prior to the issue of an occupation certificate.

73. Excess Material

All excess material is to be removed from the site. The spreading of excess material or stockpiling on site will not be permitted without prior written approval from Council.

74. Public Safety

Any works undertaken in a public place are to be maintained in a safe condition at all times in accordance with AS 1742.3. Council may at any time and without prior notification make safe any such works Council considers to be unsafe, and recover all reasonable costs incurred from the applicant.

75. Compliance with Council Specification

All design and construction work shall be in accordance with:

a. Council's specification for Construction of Subdivisional Road and Drainage Works (as amended)
b. Campbelltown (Sustainable City) DCP - Volumes 1 and 3 as amended
c. 'Soils and Construction (2004) (Bluebook) and
d. relevant Australian standards and State Government publications.

76. Footpath Kerb and Gutter

The applicant shall re-construct all damaged bays of concrete path paving and kerb and gutter, adjacent to the site, in Rudd Road and Kingsclare Street. Areas not concreted shall be re-graded, topsoiled and turfed/landscaped as approved. All works shall be in accordance with Council's Specification for Construction of Subdivisional Road and Drainage Works (as amended) and with the design requirements detailed in the Campbelltown (Sustainable City) DCP - Volume 3 (as amended).

77. Footpath

The footpath adjoining the subject land shall be regraded in accordance with levels obtained from Council, and concrete footpath paving / pavers 1.2 metres wide shall be constructed / laid along the full site frontage on Kingsclare Street as shown on the approved plan in accordance with Council's Specification for Construction of Subdivisional Road and Drainage Works (as amended) and the design requirements detailed in the Campbelltown (Sustainable City) DCP - Volumes 1 and 3 (as amended) to the satisfaction of Council. Areas not concreted shall be topsoiled and turfed / landscaped. The footpath formation may need to be extended beyond the site boundaries, to provide an acceptable transition to the existing footpath levels.

78. Medium Density Driveway and Layback Crossing

The applicant shall provide a reinforced concrete footpath crossing and layback at the entrance to the property, in accordance with Council's Medium Density Vehicle Crossing Specification and the Campbelltown (Sustainable City) DCP - Volume 3 (as amended).

A separate application for this work, which will be subject to a crossing inspection fee and inspections by Council, must be lodged with Council prior to pouring the concrete. Where necessary, conduits shall be provided under the footpath crossing, in accordance with the relevant service authority's requirements.

79. Associated Works

The applicant shall undertake any works external to the development, that are made necessary by the development, including additional road and drainage works or any civil works directed by Council, to make a smooth junction with existing work.

80. Redundant Laybacks

All redundant laybacks shall be reinstated as conventional kerb and gutter, in accordance with Council's Specification for Construction of Subdivisional Road and Drainage Works (as amended) and the design requirements detailed in the Campbelltown (Sustainable City) DCP - Volume 3 (as amended).

81. Demolition Work/Plan

All work shall be completed in accordance with the approved demolition work plan designed in accordance with clause 1.7.3 of Australian Standard A52601-2001 The Demolition of Structures.

82. Completion of Construction Works

Unless otherwise specified in this consent, all construction works associated with the approved development shall be completed within 12 months of the date of the notice of the intention to commence construction works under Section 81A of the Act.

In the event that construction works are not continually ongoing, the applicant shall appropriately screen the construction site from public view with architectural devices and landscaping to Council's written satisfaction.

83. Imported 'waste-derived' fill material

The only waste-derived fill material that may be received at the development site is:

a. virgin excavated natural material (within the meaning of the Protection of the *Environment Operations Act 1997*) and

b. any other waste-derived material the subject of a resource recovery exemption under cl.51A of the Protection of the Environment Operations (Waste) Regulation 2005 that is permitted to be used as fill material.

Any waste-derived material the subject of resource recovery exemption received at the development site must be accompanied by documentation as to the material's compliance with the exemption conditions and must be provided to the Principal Certifying Authority on request.

PRIOR TO THE ISSUE OF AN OCCUPATION CERTIFICATE

The following conditions of consent must be complied with prior to the issue of an occupation certificate by either Campbelltown City Council or an accredited principal certifying authority. All necessary information to comply with the following conditions of consent must be submitted with the application for an occupation certificate.

Note: Under this subheading, for the purpose of issuing an occupation certificate, any reference to "occupation certificate" shall also be taken to mean "interim occupation certificate".

84. Section 73 Certificate

Prior to the principal certifying authority issuing an occupation certificate (or subdivision certificate, whichever shall occur first), a Section 73 Compliance Certificate under the *Sydney Water Act 1994* must be obtained from Sydney Water Corporation. Early application for the certificate is suggested as this can also impact on other services and building, driveway or landscape design.

Application must be made through an authorised Water Servicing Coordinator.

For help either visit www.sydneywater.com.au > Building and developing > Developing your Land > Water Servicing Coordinator or telephone 13 20 92.

The Section 73 Certificate must be submitted to the Principal Certifying Authority prior to the issue of an occupation certificate.

85. Structural Engineering Certificate

Prior to the principal certifying authority issuing an occupation certificate, the submission of a certificate from a practising structural engineer certifying that the building has been erected in compliance with the approved structural drawings and relevant SAA Codes and is structurally adequate.

86. Completion of External Works Onsite

Prior to the principal certifying authority issuing an occupation certificate, all external works, repairs and renovations detailed in the schedule of treatment/finishes, landscaping, driveways, fencing and retaining walls to be completed to the satisfaction of the principal certifying authority.

87. Works as Executed Plans

Prior to the principal certifying authority issuing an occupation certificate the applicant shall submit to Council two copies of a work as executed plan, certified by a qualified surveyor, which is in accordance with Council's Specification for Construction of Subdivisional Road and Drainage Works (as amended) and the requirements detailed in the Campbelltown (Sustainable City) DCP - Volume 3 (as amended).

88. Restoration of Public Roads

Prior to the principal certifying authority issuing an occupation certificate, any restoration of the public road pavement required as a result of the development, shall be carried out by Council and all costs shall be paid by the applicant.

89. Public Utilities

Prior to the principal certifying authority issuing an occupation certificate, any adjustments to public utilities, required as a result of the development, shall be completed to the satisfaction of the relevant authority and at the applicant's expense.

90. Service Authorities

Prior to the principal certifying authority issuing an occupation certificate, two copies of all servicing plans shall be forwarded to Council in accordance with the following:

Written advice from Sydney Water, Integral Energy and where applicable the relevant gas company, shall be submitted, stating that satisfactory arrangements have been made for the installation of either service conduits or street mains in road crossings, prior to the construction of the road pavement. All construction work shall conform to the relevant authorities specification/s.

The final seal shall be deferred pending installation of all services. In this regard the applicant shall provide a temporary seal and lodge with Council as security, the amount to be determined by Council, to cover the cost of trench restoration by Council and the placement of the final asphaltic concrete seal.

91. House Numbers

Prior to the principal certifying authority issuing an occupation certificate the house number shall be stencilled onto the kerb at appropriate location(s) with black numbers 75mm high on a white background using approved pavement marking grade paint.

92. Line Marking / Sign Posting Documentation (Development)

Prior to the principal certifying authority issuing an occupation certificate, the applicant shall submit to Council, for the Local Traffic Committee's records, two copies of the work as executed plans for the line marking / sign posting, undertaken in relation to the development. The information shown on the plan shall be in accordance with the recommendations of the Traffic Committee and shall note the date/s of installation.

93. Council Fees and Charges

Prior to the principal certifying authority issuing an Occupation Certificate, the applicant shall obtain written confirmation from Council that all applicable Council fees and charges associated with the development have been paid in full. Written confirmation will be provided to the applicant following Council's final inspection and satisfactory clearance of the public area adjacent the site.

ADVISORY NOTES

The following information is provided for your assistance to ensure compliance with the *Environmental Planning and Assessment Act 1979*, Environmental Planning and Assessment Regulation 2000, other relevant Council Policy/s and other relevant requirements. This information does not form part of the conditions of development consent pursuant to Section 80A of the Act.

Advice 1. *Environmental Planning and Assessment Act 1979* Requirements

The *Environmental Planning and Assessment Act 1979* requires you to:

a. Obtain a construction certificate prior to the commencement of any works. Enquiries regarding the issue of a construction certificate can be made to Council's Customer Service Centre on 4645 4000.

b. Nominate a principal certifying authority and notify Council of that appointment prior to the commencement of any works.

c. Give Council at least two days notice prior to the commencement of any works.

d. Have mandatory inspections of nominated stages of the construction inspected.

e. Obtain an occupation certificate before occupying any building or commencing the use of the land.

Advice 2. Tree Preservation Order

To ensure the maintenance and protection of the existing natural environment, you are not permitted to ringbark, cut down, top, lop, remove, wilfully injure or destroy a tree outside three metres of the building envelope unless you have obtained prior written consent from Council. Fines may be imposed if you choose to contravene Council's Tree Preservation Order.

A tree is defined as a perennial plant with self-supporting stems that are more than three metres or has a trunk diameter more than 150mm measured one metre above ground level, and excludes any tree declared under the *Noxious Weeds Act (NSW).*

Advice 3. Provision of Equitable Access

Nothing in this consent is to be taken to imply that the development meets the requirements of the *Disability Discrimination Act 1992* (DDA1992) or Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards).

Where a Construction Certificate is required for the approved works, due regard is to be given to the requirements of the Building Code of Australia (BCA) and the Premises Standards. In this regard it is the sole responsibility of the certifier, building developer and building manager to ensure compliance with the Premises Standards.

Where no building works are proposed and a Construction Certificate is not required, it is the sole responsibility of the applicant and building owner to ensure compliance with the DDA1992.

Advice 4. Smoke Alarms

From 1 May 2006 all NSW residents must have at least one working smoke alarm installed on each level of their home. This includes owner occupier, rental properties, relocatable homes and any other residential building where people sleep.

The installation of smoke alarms is required to be carried out in accordance with AS 3786. The licensed electrical contractor is required to submit to the Principal Certifying Authority a certificate certifying compliance with AS 3000 and AS 3786.

Advice 5. Covenants

The land upon which the subject building is to be constructed may be affected by restrictive covenants. Council issues this approval without enquiry as to whether any restrictive covenant affecting the land would be breached by the construction of the building, the subject of this permit. Persons to whom this permit is issued must rely on their own enquiries as to whether or not the building breaches any such covenant.

Advice 6. Inspections – Civil Works

Where Council is nominated as the principal certifying authority for civil works, the following stages of construction shall be inspected by Council.

a. EROSION AND SEDIMENT CONTROL –

   i. direction/confirmation of required measures
   ii. after installation and prior to commencement of earthworks
   iii. as necessary until completion of work.

b. STORMWATER PIPES – Laid, jointed and prior to backfill.

c VEHICLE CROSSINGS AND LAYBACKS – Prior to pouring concrete.

d FINAL INSPECTION – All outstanding work.

Advice 7. Inspection within Public Areas

All works within public areas are required to be inspected at all stages of construction and approved by Council prior to the principal certifying authority releasing the Occupation Certificate.

Advice 8. Adjustment to Public Utilities

Adjustment to any public utilities necessitated by the development is required to be completed prior to the occupation of the premises and in accordance with the requirements of the relevant Authority. Any costs associated with these adjustments are to be borne by the applicant.

Advice 9. Salinity

Please note that Campbelltown is an area of known salinity potential. As such any salinity issues should be addressed as part of the construction certificate application. Further information regarding salinity management is available within Campbelltown (Sustainable City) DCP - Volumes 1 and 3 (as amended).

Advice 10. Asbestos Warning

Should asbestos or asbestos products be encountered during construction or demolition works you are advised to seek advice and information prior to disturbing the material. It is recommended that a contractor holding an asbestos-handling permit (issued by Work Cover NSW), be engaged to manage the proper disposal and handling of the material. Further information regarding the safe handling and removal of asbestos can be found at:

www.environment.nsw.gov.au
www.nsw.gov.au/fibro
www.adfa.org.au
www.workcover.nsw.gov.au

Alternatively, call Work Cover Asbestos and Demolition Team on 8260 5885.

Advice 11. Rain Water Tank

It is recommended that water collected within any rainwater tank as part of the development be limited to non-potable uses. NSW Health recommends that the use of rainwater tanks for drinking purposes not occur where a reticulated potable water supply is available.

Advice 12. Dial before you Dig

Underground assets may exist in the area that is subject to your application. In the interests of health and safety and in order to protect damage to third party assets please contact Dial before you dig at www.1100.com.au or telephone on 1100 before excavating or erecting structures (This is the law in NSW). If alterations are required to the configuration, size, form or design of the development upon contacting the Dial before you dig service, an amendment to the development consent (or a new development application) may be necessary. Individuals owe asset owners a duty of care that must be observed when working in the vicinity of plant or assets. It is the individual's responsibility to anticipate and request the nominal location of plant or assets on the relevant property via contacting the Dial before you dig service in advance of any construction or planning activities.

Advice 13. *Telecommunications Act 1997 (Commonwealth)*

Telstra (and its authorised contractors) are the only companies that are permitted to conduct works on Telstra's network and assets. Any persons interfering with a facility or installation owned by Telstra is committing an offence under the *Criminal Code Act 1995 (Cth)* and is liable for prosecution.

Furthermore, damage to Telstra's infrastructure may result in interruption to the provision of essential services and significant costs. If you are aware of any works or proposed works which may affect or impact on Telstra's assets in any way, you are required to contact: Telstra's Network Integrity Team on phone number 1800 810 443.

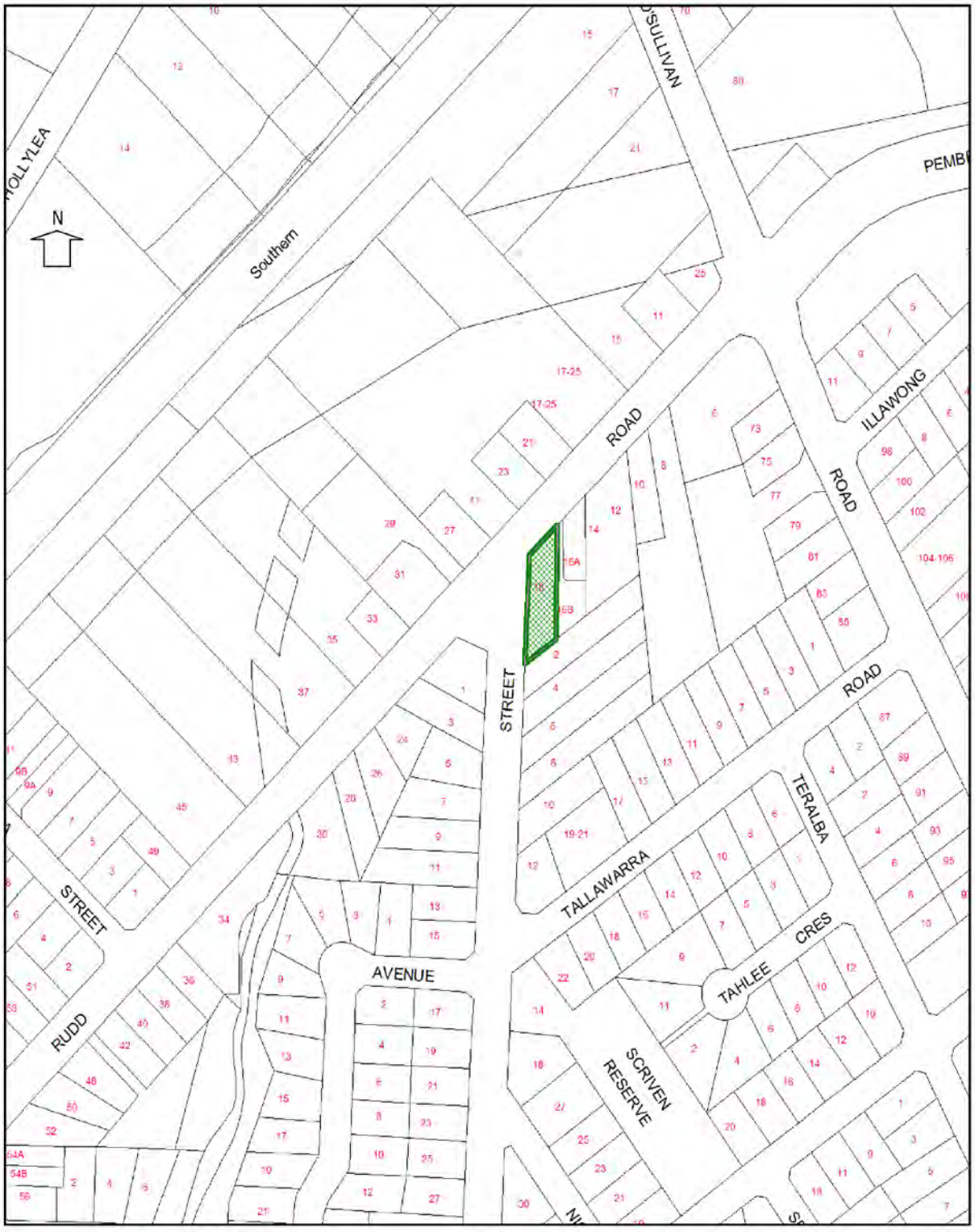
Advice 14. Fencing

Attention is directed to the provisions of the *Dividing Fences Act 1991*, in relation to the fencing of the boundaries of the overall site.

END OF CONDITIONS

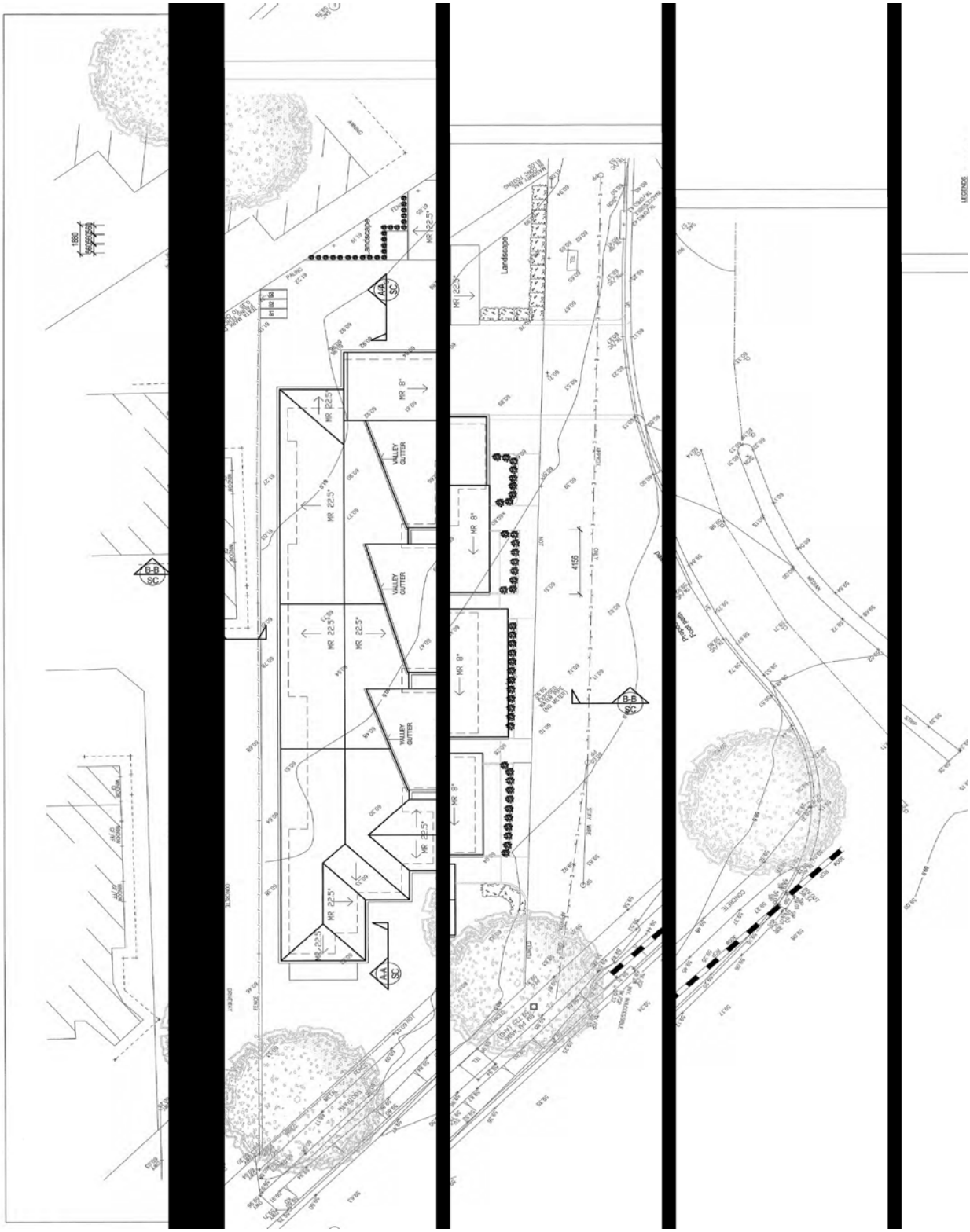
ATTACHMENT 2

Locality Plan
No. 18 Rudd Road, Leumeah



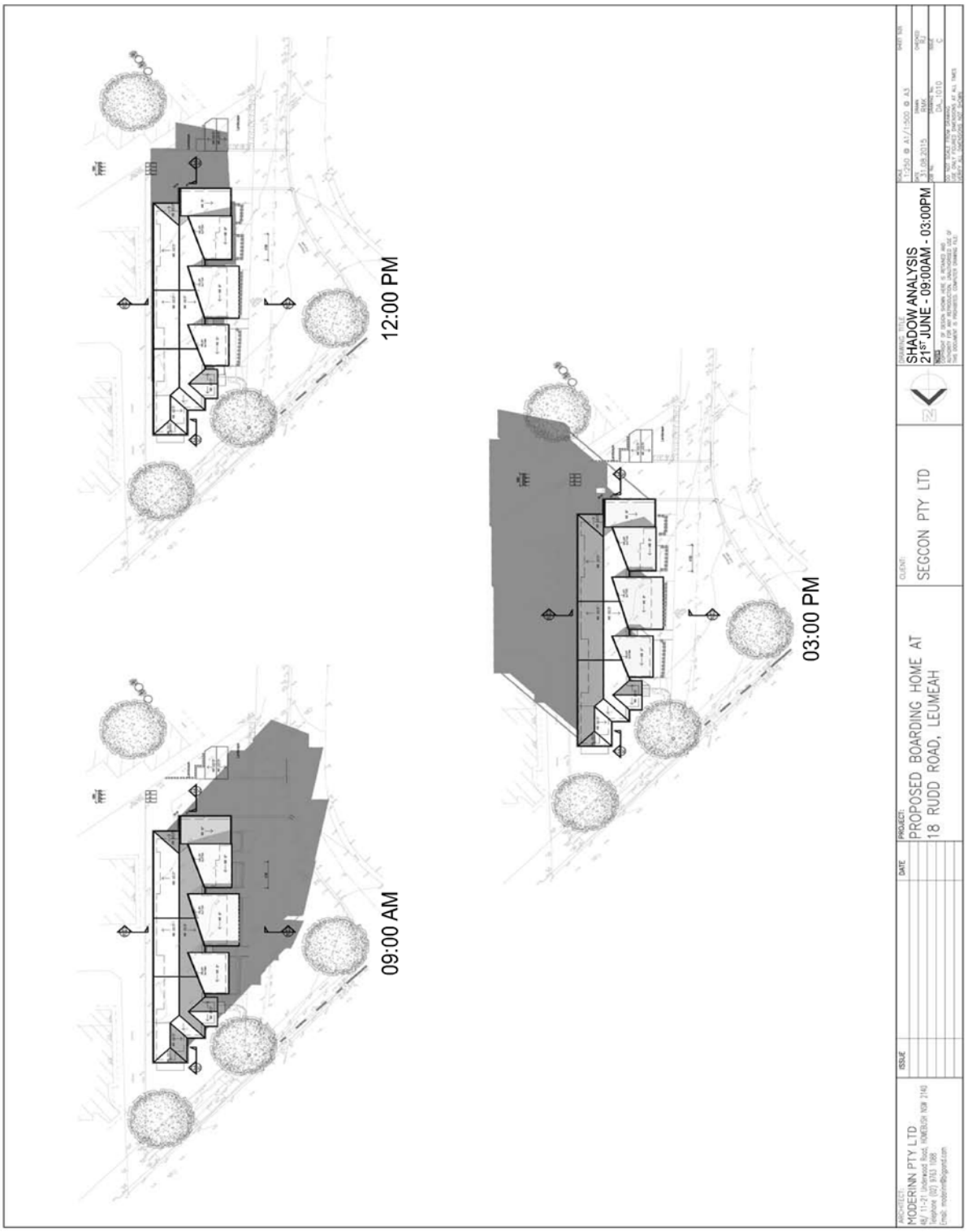
ATTACHMENT 3

Roof Plan



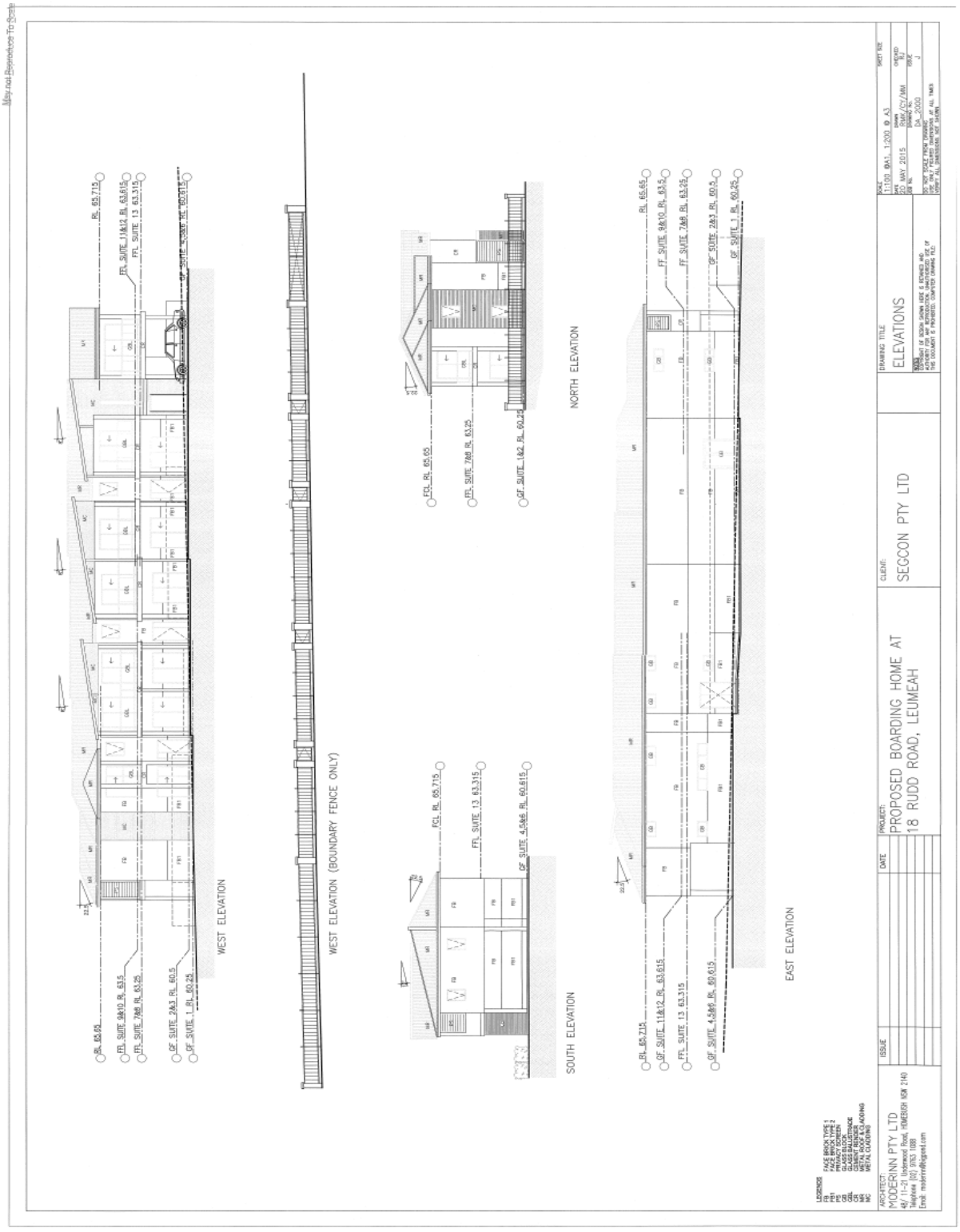
ATTACHMENT 4

Shadow Diagrams



ATTACHMENT 5

Elevations



3.4 Construction of a medical centre and childcare centre with associated car parking at No. 20 Lind Street, Minto

Reporting Officer

Acting Manager Development Services

Attachments

1. Recommended reasons for refusal (contained within this report)
2. Locality plan (contained within this report)
3. Roof plan (contained within this report)
4. Childcare centre elevations (contained within this report)
5. Medical centre elevations (contained within this report)
6. Plans of proposed works to cottage (contained within this report)
7. Perspective drawings (contained within this report)
8. Site/Floor plan (distributed under separate cover - confidential – for privacy reasons this plan is not available to members of the public)
9. Landscape plan (distributed under separate cover - confidential – for privacy reasons this plan is not available to members of the public)
10. Notification plan (distributed under separate cover - confidential – for privacy reasons this plan is not available to members of the public)

Purpose

To assist Council in its determination of the subject Development Application in accordance with the provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Property Description	Redfern's Cottage, Lot 50 DP 1028174, No. 20 Lind Street, Minto
Application No	2952/2014/DA-C
Applicant	JD One Enterprise Pty Ltd
Owner	JD One Enterprise Pty Ltd
Provisions	Campbelltown 2025 - Looking Forward
	State Environmental Planning Policy (Infrastructure) 2007
	State Environmental Planning Policy 55 - Remediation of Land
	Campbelltown (Urban Area) Local Environmental Plan 2002
	Draft Campbelltown Local Environmental Plan 2014 (now gazetted as Campbelltown Local Environmental Plan 2015)
	Campbelltown (Sustainable City) Development Control Plan 2014
Date Received	5 December 2014

History

Redfern's Cottage (also known as Campbellfield) is listed as having historical significance for its associations with Doctor William Redfern and Mrs Macquarie, and for the history of the wine industry in Australia. Dr Redfern was a leading figure in the early colony and the land as it exists today is part of an original 1811 grant to him of 800 acres. The house located on the property was originally built some time prior to 1820. The property has historical significance to the development of the Australian wine industry as Dr Redfern established a vineyard there in 1824 with a quantity of Madeira grape vines. Redfern's Cottage has historical association with William Redfern from 1819 to1828 and the property remained in the ownership of the Redfern family until its 1883 sale following its subdivision. The house was first modified/renovated during the 1880s.

Redfern's Cottage is of aesthetic significance for its setting and landscaping. The remains of the original stone cottage are of significance for their ability to demonstrate early 19th century stonework and construction techniques. As a site with a history of European occupation from 1819, the site is considered to be of high archaeological research potential. The site is a rare example of a property with a historical record of European occupation from 1819.

Several modifications were made to the house between 1900 and the 1960s. In 1965 the house was substantially demolished and rebuilt. The cellar, part of the south eastern exterior wall, some internal walls, part of the chimney, and the sandstone verandah flagging are remnants from Redfern's original house.

In 1969 the State Planning Authority of New South Wales acquired the property for "housing purposes". For some time in the 1970s the house was used as an office by the NSW Housing Commission. All of the remaining outbuildings on the site were demolished at some point between 1975 and 1988. Over the next thirty years, subdivisions reduced the size of the land surrounding the house while the property remained in the ownership of the State.

In 1995 a citywide heritage study for the Campbelltown Local Government Area was adopted by Council. It recommended that Redfern's Cottage be listed as a heritage item. Redfern's Cottage was formally listed as a heritage item under Draft Campbelltown Local Environmental Plan 1996 and in 1997 under Development Control Plan 83 - Heritage Policy. Its heritage listing was subsequently retained under Campbelltown (Urban Area) Local Environmental Plan 2002.

In December 2014 Landcom (now known as UrbanGrowth NSW) sold the property to JD One Enterprise Pty Ltd, who has lodged the subject development application.

In March 2015, the NSW Heritage Council wrote to Council advising that whilst Redfern's Cottage has local heritage significance, it is unlikely that its heritage values would reach the threshold for listing on the State Heritage Register. However, the Heritage Council recommended that Council consider the possible and likely presence of archaeological remnants on the property and the need for these materials to be properly considered and managed as part of any future development on the property.

Report

Redfern's Cottage is located at No. 20 Lind Street, Minto and is listed as an item of local heritage significance under Campbelltown Local Environmental Plan 2015. The site is currently zoned R5 Large Lot Residential under that same Plan.

The site has an area of 9,061.6sqm and is irregularly shaped. It is adjoined to the north by Minto Catholic Church and its expansive grounds, to the west by Minto Marketplace and to the south/south-east by residential development and a public reserve. Apart from the cottage, the site contains several mature trees and an area of bitumen, as well as chain wire fencing surrounding the cottage. The site is accessed by a concrete driveway from Lind Street.

The application proposes the following works:

- Construction of a single-storey medical centre in the north-western part of the site. The proposed medical centre would accommodate rooms for 11 general practitioners, imaging and pathology sections, a pharmacy, a dentist and a café.

- Construction of a single-storey child care centre in the northern part of the site. The proposed childcare centre would accommodate 130 children.

- Refurbishment of the cottage including reinstating components sympathetic to the cottage's original form, including:

  - reconstruction of two stone fireplaces, two chimneys and an internal wall
  - reconstruction of the stone laundry in the north-eastern corner of the cottage to accommodate an interpretive cabinet
  - reconstruction of the attic, stairs and walls
  - removal of internal stud walls
  - replacement of windows and doors to the northern wall (which was constructed in the 1950s/1960s) with frameless folding glass doors that have the dining area of the café opening out on to the veranda
  - repair and repointing of brickwork of the south-west wall of the building, and reinstatement of two doors
  - removal of the existing toilet (which was constructed in the 1950s)
  - reinstatement of doors and windows to existing openings, demolition and removal of intrusive fabric, repairing render, replastering and repainting interiors.

- Partial use of Redfern’s Cottage in association with the proposed childcare centre (the plans are unclear as to in what capacity the cottage would accommodate the childcare centre).

- Provision of a café within part of Redfern's Cottage.

- Construction of a car park with 83 car parking spaces in the southern and eastern parts of the site.

- Widening and reconstruction of the section of Lind Street in front of the subject site, to make the road surface and width the same as the rest of Lind Street.

1. Vision

'Campbelltown 2025 Looking Forward' is a statement of broad town planning intent for the longer term future of the City of Campbelltown that:

- responds to what Council understands people want the City of Campbelltown to look, feel and function like
- recognises likely future government policies and social and economic trends and
- sets down the foundations for a new town plan that will help achieve that future.

The document establishes a set of strategic directions to guide decision making and development outcomes. These directions are broad in nature and form a prelude to a new statutory town plan for the City.

The strategic direction relevant to this application is:

- creating education, employment and entrepreneurial opportunities
- building a distinctive Campbelltown sense of place.

The application is consistent with the first of these strategic directions in that it would add three businesses to the City of Campbelltown and provide several employment opportunities. However, the application is considered to be inconsistent with the second of these objectives, as the proposed development (as will be discussed below) does not give due regard to the association of the site and the broader City with William Redfern, as it would not allow the original context of his cottage to be appreciated and interpreted, and would adversely affect public views to and from it.

2. Planning Provisions

The development has been assessed in accordance with the heads of consideration under Section 79C of the *Environmental Planning and Assessment Act 1979*, and having regard to those matters the following issues have been identified for further consideration.

2.1 Relationship of Environmental Planning Instruments

Due to the timing of the development application's submission to Council and the changes that have been made to local planning instruments during its assessment timeframe, it is important to describe how each of the local environmental plans relate to each other.

At the time of lodgement in December 2014, Campbelltown (Urban Area) Local Environmental Plan 2002 (the Urban Area LEP 2002) was the relevant local planning instrument. Prior to receipt of the application, Council had publicly exhibited a draft Local Environmental Plan, which means that draft is a 'matter for consideration' pursuant to Section 79C(1)(a)(ii) of the *Environmental Planning and Assessment Act 1979* (the Act). The draft Local Environmental Plan (known at the time as Draft Campbelltown Local Environmental Plan 2014) has since been gazetted and has commenced and is now known as Campbelltown Local Environmental Plan 2015 (CLEP 2015).

According to transitional provisions within the draft CLEP 2014 and recently commenced CLEP 2015, the Urban Area LEP 2002 takes precedence in the assessment of this application, as it was the presiding planning instrument at the time the application was lodged. The lodgement date of a development application dictates its assessment, more so than its determination date.

However and as mentioned above, Council must also consider the new CLEP 2015 as it was a draft instrument at the time of the application's lodgement. As such, both Plans have relevance and are referenced throughout the report.

To comply with the LEP transitional arrangements mentioned above, this report has been written (unless otherwise specifically stated) as if CLEP 2015 had not commenced. Instead, despite the commencement of CLEP 2015, the Urban Area LEP 2002 is referred to in the report as the current local planning instrument.

2.2 State Environmental Planning Policy (Infrastructure) 2007

Medical centres would be defined as "commercial premises" which are prohibited land uses within the 2(b) Residential B Zone under the Campbelltown Local Environmental Plan 2002. The proposal relies upon the Infrastructure SEPP (the ISEPP) for the medical centre's permissibility. Under the ISEPP, a "health services facility" is permissible with consent in the R1 General Residential zone or an equivalent land use zone. A health services facility is defined as:

> "a facility used to provide medical or other services relating to the maintenance or improvement of the health, or the restoration to health, of persons or the prevention of disease in or treatment of injury to persons, and includes the following:
>
> (a) day surgeries and medical centres,
> (b) community health service facilities,
> (c) health consulting rooms,
> (d) facilities for the transport of patients, including helipads and ambulance facilities,
> (e) hospitals."

Medical centres are included within the definition of "health services facility" under point (a) above. The subject site is zoned 2(b) zone under Campbelltown Local Environmental Plan 2002 which, according to a 'zone equivalency table' published by the Department of Planning, is considered to be equivalent to the R1 zone making the proposed medical centre permissible with consent.

With regard to the proposed pharmacy, it is permissible by virtue of the fact that it would provide "services relating to the maintenance or improvement of the health, or the restoration to health, of persons or the prevention of disease in or treatment of injury to persons".

With regard to the proposed café, this component of the development is considered to be ancillary to the overall development. It would not function independently and would rely upon visitors to the medical centre and childcare centre forming the vast majority of its customers.

Therefore, these aspects of the proposed development are permissible under the ISEPP.

2.3 State Environmental Planning Policy 55 - Remediation of Land

State Environmental Planning Policy 55 - Remediation of Land (SEPP 55) states that a consent authority must not consent to the carrying out of any development on land unless it has considered whether the land is contaminated, and if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out.

As the subject site has a history of agricultural land uses, the applicant was required to submit a Detailed Site Investigation prepared by a qualified environmental consultant with the application. The investigation determined that the site would be suitable for the proposed development, subject to certain recommendations being implemented. These recommendations would form conditions of consent if the application were to be approved.

2.4 Campbelltown (Urban Area) Local Environmental Plan 2002

The subject site is zoned 2(b) - Residential B Zone under the provisions of Campbelltown (Urban Area) Local Environmental Plan 2002 (the Urban Area LEP 2002). The proposed development is defined as a childcare centre, commercial premises and refreshment room. Childcare centres are permissible with consent within the 2(b) - Residential B Zone, whilst commercial premises and refreshment rooms are not. Notwithstanding, the permissibility of the medical centre, pharmacy and café under the ISEPP has been established earlier in this report. The ISEPP is a higher order planning instrument than the local planning controls and therefore must take precedence in an assessment of development permissibility.

The objectives of the 2(b) - Residential B Zone that are relevant to the proposal are:

(a) to allow development which:

  (i) is compatible with residential use, and
  (ii) is capable of visual integration with the surrounding buildings, and
  (iii) serves the needs of the surrounding population without conflicting with the residential intent of the zone, and
  (iv) does not place demands on services beyond the level reasonably required for residential use.

(b) to encourage a high quality standard of development which is aesthetically pleasing, functional and relates sympathetically to nearby and adjoining development.

Except as otherwise provided by this plan, consent must not be granted for development on land within this zone unless the consent authority is of the opinion that carrying out the proposed development would be consistent with one or more of the objectives of this zone.

The proposed development is considered to be inconsistent with both of the zone objectives that are relevant to the proposal. In this regard, the proposed development is considered to be incapable of visual integration with surrounding buildings and unable to relate to adjoining development, given that it would adversely affect views to and from the existing cottage (which is discussed further below) and would inhibit the building's original form and context from being appreciated and interpreted authentically.

Division 2 – Conservation of heritage items

The objectives of the Urban Area LEP 2002 in relation to heritage are:

(a) to conserve the environmental heritage of the City of Campbelltown, and
(b) to conserve the heritage significance of existing significant fabric, relics, settings and views associated with the heritage significance of heritage items and heritage conservation areas, and
(c) to ensure that archaeological sites and places of Aboriginal heritage significance are conserved, and
(d) to allow for the protection of places which have the potential to have heritage significance but are not identified as heritage items, and
(e) to ensure that the heritage conservation areas throughout the City of Campbelltown retain their heritage significance.

In this regard, to determine the extent to which the carrying out of development that proposes to alter a heritage item or construct a building on land upon which a heritage item is located would affect the heritage significance of a heritage item, the Urban Area LEP 2002 requires a heritage impact statement and conservation management plan to be submitted, addressing at minimum the following issues:

(i) the heritage significance of the item as part of the environmental heritage of the City of Campbelltown, and
(ii) the impact that the proposed development will have on the heritage significance of the item and its setting, including any landscape or horticultural features, and
(iii) the measures proposed to conserve the heritage significance of the item and its setting, and
(iv) whether any archaeological site or potential archaeological site would be adversely affected by the proposed development, and
(v) the extent to which the carrying out of the proposed development would affect the form of any historic subdivision, and

In addition to considering the potential impact of development upon a heritage item itself, Council is required to consider the impact of development upon known or potential archaeological sites. Before granting consent for development that will be carried out on an archaeological site or a potential archaeological site of a relic that has non-Aboriginal heritage significance, Council must:

(a) consider a heritage impact statement explaining how the proposed development will affect the conservation of the site and any relic known or reasonably likely to be located at the site, and
(b) be satisfied that any necessary excavation permit required by the *Heritage Act 1977* has been granted.

The information submitted initially with the application was not sufficient to enable a full and proper assessment of the above matters. The proposal failed to provide plans showing what works were proposed to the cottage, did not include a Conservation Management Plan, did not provide an archaeological analysis, and did not consider views to and from the cottage. The applicant's submission also sought to question the well-established historical links of William Redfern to the subject site.

The application was referred to an independent heritage consultant, who was appointed by Council to review the proposal on two occasions.

A Statement of Heritage Impact and Conservation Management Plan were submitted with the application, and plans showing the proposed works to the cottage were provided. Assessment of the information by the independent heritage consultant has provided that the application is deficient from a heritage/conservation perspective, for the following reasons:

1. The application does not properly consider the relationship of the proposed new buildings to the existing cottage, including the potentially adverse impact of the provision of ramps and fencing around the cottage. In particular however, the proposed development's impact on views to and from the cottage would be adverse. As noted by the independent heritage consultant appointed by Council:

   > "The impact of the proposal on significant views to and from the cottage (including public views to the cottage) has not been taken into account in designing the proposal. For example, the proposed development which would obscure the north elevation of the cottage (original front elevation) is not acceptable in our opinion, and adequate separation needs to be provided between the cottage and any proposed new buildings on the site."

   Further separation between the proposed buildings and the existing cottage would allow the cottage to be viewed from all sides (whilst on the site) and would expand public viewing opportunities from outside the site. It would also allow the building's original form and context to be appreciated and interpreted in a far more respectful manner.

2. A detailed archaeological assessment of the site has not been undertaken. The applicant's Conservation Management Plan merely recommends that such an investigation take place. However, as noted by the independent heritage consultant appointed by Council:

   > "It is not acceptable to undertake archaeological investigation during site preparation as proposed. At this point of the project the construction is committed and if significant archaeology were discovered there could be significant delays to construction to undertake investigation that inevitably place pressure on any requirement to undertake excavation that may arise. If very significant elements were discovered it could result in a need to redesign and for an amended application."

   In this regard, without a detailed archaeological investigation being undertaken prior to consent being granted for any development on the site, Council cannot be certain that any significant elements found could be retained and protected, as the approved plans would allow for works on the site that would necessitate the removal of such elements. Further, the Heritage Council recommended in its correspondence to Council that Council consider the possible and likely presence of archaeological remnants on the property and the need for these materials to be properly considered and managed as part of any future development on the property. The current proposal is inconsistent with this recommendation.

3. Whilst sketch plans were included within the applicant's Conservation Management Plan showing the proposed works to the cottage, these plans do not match those shown on the architectural plans. The architectural plans show that the cottage would be used to accommodate cots/bottle preparation in association with the childcare centre, and show the demolition of several internal walls. However, the more recent plans included within the Conservation Management Plan are unclear as to the proposed usage of the cottage particularly the northern part of the cottage, and show a different internal floor plan configuration, with no public amenities shown. Without being certain of the proposed usage of the cottage, and with conflicting plans being submitted, Council cannot be certain of the impact that usage of the cottage would have and whether the use of the cottage would allow for appropriate public interpretation of the cottage.

2.5 Draft Campbelltown Local Environmental Plan 2014 (now gazetted as Campbelltown Local Environmental Plan 2015)

The application was lodged after the commencement of the exhibition of the draft Campbelltown Local Environmental Plan 2014 during June and July 2014, which has now been gazetted as Campbelltown Local Environmental Plan 2015 (CLEP 2015). Accordingly, under Section 79C(1)(a)(ii), the provisions of the Plan must be taken into consideration in the assessment of the application. An assessment of the application against the relevant provisions of the Plan is presented below:

a. Zoning/Permissibility

The zoning of the subject property under the CLEP 2015 is R5 – Large Lot Residential. Childcare centres are permissible within the R5 zone whilst medical centres and cafes are not. However, Schedule 1 of the Plan identifies a medical centre and associated uses as an additional land use that is permissible on the subject site. Therefore, the proposed development (including the ancillary café) is permissible with development consent on the site.

The objectives of the R5 zone are as follows:

1. To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality.
2. To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future.
3. To ensure that development in the area does not unreasonably increase the demand for public services or public facilities.
4. To minimise conflict between land uses within this zone and land uses within adjoining zones.
5. To enable development for certain purposes other than residential only if that development is compatible with the character and scale of the living area.
6. To minimise overshadowing and ensure a desired level of solar access to all properties.

Of these, objectives 2, 3, 4, 5 and 6 are considered to be relevant, whilst objective 1 relates primarily to dwelling proposals within scenic rural settings.

The proposed development is considered to be consistent with objectives 2, 3, 4 and 6, given its satisfactory outcomes with respect to traffic, noise, spatial relief, solar access and visual privacy insofar as they relate to adjoining properties. However, the proposed development is considered to be inconsistent with objective 5 insofar as the proposed development would detrimentally affect the character of the existing heritage item on the site, by failing to provide an adequate spatial relief between the cottage and the proposed buildings, which would not allow the cottage's original context to be appreciated.

b. Height of buildings

Under the CLEP 2015, the maximum building height applying to the subject site is 9 metres. The proposed development would have a maximum height of 5.2 metres, and would therefore comply with the standard.

c. Floor space ratio

The maximum floor space ratio for a childcare centre in a residential zone is 0.55:1. The whole development including all three buildings combined has a floor space ratio of 0.23:1 and therefore complies with this standard.

d. Heritage conservation

The heritage conservation provisions are the same as those under the CLEP 2002. An assessment against these has been outlined earlier in this report.

2.6 Campbelltown (Sustainable City) Development Control Plan 2014 (SCDCP)

2.6.1 Part 2 - Requirements Applying to All Types of Development

The general provisions of Part 2 of the Plan apply to all types of development. An assessment of the application against the relevant provisions of Part 2 of the Plan is shown below:

a. Views and vistas

The SCDCP requires that development appropriately respond to Campbelltown's important views and vistas to and from heritage items.

The application does not properly consider the relationship of the proposed new buildings to the existing cottage. The proposed development's impact on views to and from the cottage would be adverse, due to the siting of the proposed childcare centre. As noted by the independent heritage consultant appointed by Council:

> "The impact of the proposal on significant views to and from the cottage (including public views to the cottage) has not been taken into account in designing the proposal. For example, the proposed development, which would obscure the north elevation of the cottage (original front elevation) is not acceptable in our opinion, and adequate separation needs to be provided between the cottage and any proposed new buildings on the site."

Further separation between the proposed buildings and the existing cottage would allow the cottage to be viewed from all sides from within the site and would expand the public viewing opportunities from outside the site. It would also allow the building's original form and context to be appreciated and interpreted in a far more respectful manner.

b. Sustainable building design

Based on the size of the roof area of the development, a 10,000 litre rainwater tank is required to be provided. A 10,000 litre rainwater tank has been shown on the plans, in compliance with this standard.

c. Landscaping

The application proposes a comprehensive landscaping scheme, with landscaping surrounding the boundaries of the property, between buildings and within the front portion of the site facing Lind Street. The most significant existing trees would be retained and incorporated into the landscaped areas. One existing tree would be relocated outside the area of the proposed building footprint so as to ensure its conservation. Overall the proposed landscaping is considered to be satisfactory.

d. Stormwater

The proposed development would drain into an existing drainage easement that traverses several residential properties to the south of the site, which the subject site is a beneficiary of. It is not clear as to whether the existing pipe within the drainage easement has the capacity to convey the stormwater runoff from the proposed development. If approval were to be granted, the developer would need to undertake investigations to Council's satisfaction to determine whether the pipe had sufficient capacity to accommodate stormwater flows from the development, and upgrade the pipe if necessary.

e. Waste management

A waste management plan has been submitted with the application and is considered to be satisfactory.

2.6.2 Part 6 – Commercial Development

Control	Required	Proposed	Compliance
Height	Two storeys	Single storey	Yes
Building Form and Character	All building façades, including rear and side elevations visible from a public place or adjacent to residential areas, shall be architecturally treated to enhance the quality of the streetscape Large buildings shall incorporate the following elements to assist in	All facades would be appropriately treated to enhance the buildings' aesthetic appeal.	Yes

Control	Required	Proposed	Compliance
	achieving a high quality architectural outcome:		
	- the provision of vertical and/or horizontal offsets in the wall surfaces at regular intervals, including columns, projections, and recesses; variation to the height of the building so that the building appears to be divided into distinct massing elements	Vertical and horizontal offsets would be provided in the wall surfaces, including projections. The roof heights of the buildings vary, in order to divide the buildings into distinct massing elements.	Yes
	- articulation of the different parts of a building's façade by use of colour, arrangement of façade elements, or by varying the types of materials used, and	Differing colours and façade elements have been used to articulate the proposed buildings.	Yes
	- maximising the interior and exterior interactions at the ground level.	Interior and exterior interactions would be sufficient.	Yes
	The main entry to the building shall be easily identifiable from the street and directly accessible through the front of the building.	The main entry to the building is easily identifiable from the street and directly accessible through the front of the building.	Yes
	Large expansive blank walls on ground floor levels or side and rear boundaries shall not be permitted unless abutting a building on an adjoining allotment.	Large expansive blank walls are not proposed.	Yes
	Roof mounted plant rooms, air conditioning units and other services and equipment shall be effectively screened from view using integrated roof structures and architectural elements.	No roof mounted structures are proposed.	Yes
	Buildings shall not incorporate highly reflective glass	A condition of consent could ensure this occurs.	Yes

Control	Required	Proposed	Compliance
	Commercial development shall be designed to address both primary and secondary street setbacks.	The proposed buildings address all directions.	Yes
	A schedule of proposed colours, materials and finishes shall accompany all development applications for new buildings.	Schedule of colours and finishes (and colour perspective drawings) have been provided.	Yes
Setbacks	Permissible commercial development within 2(b) residential zone:		
	5.5m from any street or adjoining open space.	Existing building is 38m from front property boundary	Yes
	3m from any other property boundary.	All buildings and car parking would be at least 3m from boundaries with residential properties.	Yes
Car Parking	Off street parking and loading shall be designed in accordance with Australian Standards 2890.1 and 2.	Off street parking has been designed in accordance with Australian Standards 2890.1 and 2.	Yes
	Medical facilities: one space per 25sqm gross floor area (58 based on 1,454sqm).	Medical centre gross floor area = 1,454sqm. Therefore 58 spaces are required for the medical centre.	
	Childcare centre - A minimum of one car parking space shall be provided for every four children approved to attend the child care centre (33 based on 130 children).	The childcare centre requires 33 spaces.	
	Café - 1.5 spaces per 10sqm (seven based on 46sqm).	The café requires seven spaces. The development requires a total of 98 spaces. 83 spaces are proposed.	No, see discussion below
	No car parking spaces shall be designed in a stacked configuration.	No stacked spaces proposed	Yes

Control	Required	Proposed	Compliance
	The required percentage of accessible car parking spaces within retail / commercial development shall be: - one car space per development plus - one for every 20 car parking spaces.	The proposed development would provide one accessible car parking space per 20 spaces.	Yes
Loading	Commercial development shall be designed to accommodate all related vehicle movements on site such that:		
	- all vehicles shall enter and exit the site in a forward direction	All vehicles would be able to enter and exit the site in a forward direction.	Yes
	- the area for manoeuvring of delivery and service vehicles is separate from vehicle parking areas, and preferably accessed via a rear service lane	The area for manoeuvring of delivery and service vehicles would be separate from vehicle parking areas.	Yes
	- cause minimal interference to the flow of traffic within the surrounding road network and	Council's Traffic Engineer has advised that traffic calming would be required in Edward Edgar Street as well as a no right turn from Lind Street into Lemon Tree Crescent and signage to direct the flow of traffic within the site.	Yes
	- safe and convenient access is provided for pedestrians.	The applicant would need to construct footpaths to connect to the existing footpaths.	Yes
	Loading bays shall be separated from parking and pedestrian access.	Loading bays would be separated from parking and pedestrian access.	Yes
	All loading and unloading shall take place wholly within the site.	All loading and unloading would take place wholly within the site.	Yes
	No loading or unloading shall be carried out across parking spaces, landscaped areas pedestrian aisles or on roadways.	No loading or unloading would be carried out across parking spaces, landscaped areas pedestrian aisles or on	Yes

Control	Required	Proposed	Compliance
		roadways.	
	Parking and loading bays shall be provided and clearly identified on site.	Line marking would be required if the application were to be approved.	Yes
	Required manoeuvring areas for heavy vehicles shall not conflict with car parking.	Manoeuvring areas for heavy vehicles would not conflict with car parking.	Yes
	Each new commercial building/unit having a leasable floor area more than 1,500sqm shall provide a loading area to allow for a Heavy Rigid Vehicle to manoeuvre on site.	The proposed loading area would accommodate a Medium Rigid Vehicle. This is considered to be satisfactory for a medical centre/ childcare centre, which would not require extremely large deliveries.	Satisfactory
	Loading docks and service areas shall not be visible from any public place and shall be suitably screened from adjacent properties. Screening may be achieved by locating such areas behind the buildings, by fencing, landscaping, mounding or a combination of these, or by other means to Council's satisfaction.	Loading docks would not be visible from public places, and would not affect adjoining properties.	Yes
	Each site shall have a: - maximum of one ingress and one egress for heavy vehicles (combined or separated) and - each site may have an additional ingress/egress for cars (and other light vehicles).	One access point and one egress point is proposed for all vehicles.	Yes
Landscaping	A detailed landscape plan and report shall be prepared by a suitably qualified person and submitted with all development applications for commercial development involving the construction of a new building.	A landscape plan has been submitted.	Yes
	Landscaping shall be provided between the primary street boundary and the building	A significant amount of landscaping has been proposed between the primary street boundary	Yes

Control	Required	Proposed	Compliance
		and the buildings.	
	All landscaped bays shall be a minimum 2m wide and allow for deep soil planting.	All landscaped bays are a minimum of 2m wide.	Yes
Residential Interface	Buildings adjoining residential zones and/or open space shall be setback a minimum of 3m from that property boundary.	All buildings and car parking would be at least 3m from boundaries with residential properties.	Yes
	An acoustic report may be required to be prepared as part of a development application where the proposed development is adjacent to residential or other sensitive uses, such as places of worship and child care centres.	An acoustic report has been provided. If the application were to be approved, conditions of consent would be recommended that would require satisfaction of specific predicted outcomes and compliance with the recommendations of the acoustic report.	Yes
	Any commercial buildings that are designed to accommodate the preparation of food from a commercial tenancy shall provide ventilation facilities to ensure that no odour is emitted in a manner that adversely impacts upon any residential zones.	A significant distance between the childcare centre and adjoining residential properties would ensure that no odour impacts would occur.	Yes
	External lighting shall be positioned to avoid light spillage to adjoining residential zones.	No lighting is proposed.	Yes

a. Car parking

Based on the SCDCP's car parking demand rates for each component of the proposed development (medical centre, childcare centre and café), the numerical car parking requirement for the overall development would be 98 car parking spaces, however only 83 car parking spaces are proposed to be provided on the site, plus a set down area for the drop-off and pick-up of patients of the medical centre.

However, there are two important factors with regard to the proposed development that would make the DCP's numerical requirement an overestimation of the actual car parking demand that the development would generate.

- The proposed café would be largely ancillary to the two main land uses proposed being the medical centre and childcare centre. Whilst if the café is successful the café may attract patrons who do not attend the medical centre or childcare centre, it is expected that the vast majority of the café's patrons are likely to come from the staff and visitors of the medical centre and childcare centre. Thus the demand for seven car parking spaces attributable to the café could be considered to be unrealistic, and the parking demand at any given time generated by patrons of the café who are not associated with the medical centre or childcare centre could be considered to be zero. The café is however likely to have two to three staff when it is trading so it could realistically be considered to require three car parking spaces.

- According to the applicant's traffic consultant, Road and Maritimes Services (RMS) land use traffic survey data shows that the time of peak car parking demand for a medical centre is 11.00am to 12.00pm (midday), whilst the times of peak car parking demand for a childcare centre are 7.00am to 9.00am and 4.00pm to 6.00pm. Accordingly, as the times of peak car parking demand for the two land uses are not expected to overlap, simply adding together the numerical DCP requirement for each proposed land use would tend to overestimate the overall car parking demand for the development. If the car parking demand attributable solely to the café is reduced to three and 83 car parking spaces are provided on site, then the remaining numerical shortfall is 11 spaces. This may prove to be acceptable based on the staggered peak operating times of the two main land uses proposed. However, the true nature of the car parking peak demand will only become apparent once the facility is operational.

Accordingly, whilst the proposed development fails to satisfy the DCP's numerical car parking standards, the provision of car parking for the proposed development is considered to be satisfactory, and this aspect of the development should not form a reason for refusal. If Council were of a mind to approve the proposal, a deferred commencement condition could be imposed that would require the operator/owners to provide a plan showing the additional 11 car parking spaces which would only be required to be constructed at a later time if car parking became a problem with the development.

2.6.3 Part 8 – Childcare Centres

Control	Required	Proposed	Compliance
Location	Child care centres shall not be located on an allotment that:		
	Is accessed from a State road.	The site is not accessed from a state road.	Yes
	Is within 100m of the intersection of a State road.	The site is not within 100m of the intersection of a State road.	Yes
	Is within a no through road.	The site is within a no through road.	No, see discussion below
	Has vehicular access to a	Road widening would be	Yes

Control	Required	Proposed	Compliance
	road where the carriageway is less than 6.5m in width.	undertaken to achieve a 6.5m carriageway width.	
	Has a building erected upon it that is constructed of materials that contain asbestos or lead paint.	Hazardous Materials Audit found no lead however asbestos was found, and is to be removed prior to any construction work commencing. If the application were to be approved, compliance with the Hazardous Materials Audit would be conditioned.	Yes
	Is adjacent to a: - potentially hazardous industry - hazardous industry - potentially offensive industry - offensive industry - intensive horticulture - intensive livestock keeping or - waste management facility.	No approvals have been issued for hazardous industries, potentially hazardous industries, offensive industries, intensive horticulture, intensive livestock keeping or waste management facilities on adjoining properties.	Yes
	Is within a 150m radius of a sex industry premises.	The site is not within a 150m radius of a sex industry premises.	Yes
	Presents a potential safety hazard for vehicle and pedestrian traffic, unless it can be demonstrated to Council's satisfaction that there would be no vehicular/ pedestrian conflict.	The proposed development would not cause a safety hazard, subject to the installation of a 'No Right Turn' facility from Lind Street into Jenner Street, widening and reconstruction of Part of Lind Street, and installation of footpaths.	Yes
	Child care centres shall not be located within a basement of a building (excluding storage rooms and offices ancillary to the child care centre). Child care centres shall not be permitted on a local street, unless it can be	The proposed childcare centre would be at ground level	Yes

Control	Required	Proposed	Compliance
	demonstrated to Council's satisfaction that: i) the proposed child care centre will not impact negatively on the local traffic network ii) the proposed child care centre has adequate on-site parking and manoeuvring/turning spaces and iii) the amenity of the surrounding properties is maintained.	The proposed development would achieve compliance in this regard, subject to the installation of a 'No Right Turn' facility from Lind Street into Jenner Street, widening and reconstruction of Part of Lind Street, installation of footpaths, provision of traffic calming devices in Edward Edgar Street, and signage reinforcing internal traffic movement directions. The developer would be responsible for supplying these facilities.	Yes
Site Requirements	Child care centres shall not be developed on an allotment with an area less than 800sqm. Child care centres shall only be developed on an allotment having a minimum width of 20m.	The subject site has an area of 9,061.6sqm The site width exceeds 20m.	Yes Yes
Design Requirements	The design of new purpose built buildings (including facade treatments, building massing, roof design and entrance features, setbacks and landscaping) shall complement the scale of surrounding development, character and qualities of the desired streetscape. Clothes lines and air conditioning units shall be screened and not visible by the public when viewed from a public area. The built form, design and layout of all outdoor play areas shall relate to the natural land form and setting to ensure that the amenity (visual and acoustic privacy) of adjoining properties is protected.	The design of the proposed childcare centre complements that of the existing cottage, but its setbacks from it do not. Clothes lines and air conditioning units would not be visible when viewed from a public area. The built form, design and layout of all outdoor play areas relates to the natural land form and setting	No Yes Yes

Control	Required	Proposed	Compliance
Fencing	Fencing along the primary and secondary street boundaries shall:		
	i) not be constructed of bonded sheet metal	Existing front fencing to be retained is constructed of timber and brick	Yes
	ii) not be higher than 1.2m	Existing fence is approximately 1.2m	Yes
	iii) be articulated, incorporate landscape treatments and complement the design and finish of the development.	Timber fencing complements the character of the site. Landscaping is proposed adjacent to timber fencing.	Yes
	Fencing to the rear and side boundaries shall be:		
	i) located behind the primary and secondary street setbacks and	Located behind all setbacks.	Yes
	ii) a maximum of 2.1m in height (excluding retaining walls).	2.1m.	Yes
Hours and days of operation	In residential areas, the hours and days of operation shall be limited to:		
	7.00am to 7.00pm Monday to Friday 7.00am to 6.00pm on Saturdays No operation on Sundays and public holidays	Monday to Friday 7.00am to 6.00pm	Yes
Visual and Acoustic Privacy	An acoustic report prepared by a suitably qualified person shall be submitted with all child care centre development applications demonstrating :	An acoustic report has been provided. If the application were to be approved, conditions of consent would be recommended that would require satisfaction of specific predicted outcomes and compliance with the recommendations of the acoustic report.	Yes
	i) that the noise levels generated from the child care centre, when measured over a 15 minute period, does not exceed the background noise by more than 5 db(A)		
	ii) that the noise levels comply with the		

Control	Required	Proposed	Compliance
	requirement of the Protection of *The Environment Operations Act 1997*and iii) illustrating ways to minimise the impacts of noise on adjoining properties.		
Waste Management	Waste storage/collection areas, service areas shall be screened from public view, located to minimise adverse impacts on adjoining properties. The waste collection area shall be located and designed to minimise safety hazards for any person within the site or within the adjacent private/public areas. A waste management plan shall be submitted for all child care centre developments including information with regard to the storage and disposal of used nappies.	Waste storage areas would not be visible from the street or affect adjoining properties. Waste collection area would be located and designed to minimise safety hazards. A condition of consent could require this, if consent were to be granted.	Yes Yes Yes
Additional requirements – residential zones	A maximum of 50 children shall occupy a child care centre on any single allotment. The child care centre shall be wholly located on the ground floor of the building (excluding offices and storage rooms). Child care centres shall be setback a minimum of: i) 5.5m from the primary street boundary ii) 5.0m from the rear boundary iii) 3.0m from the side boundary	130 children proposed. The childcare centre would be wholly located on the ground floor. Existing building is 38m from front property boundary No rear boundary – only side boundaries 3m	No, see discussion below Yes Yes NA Yes

Control	Required	Proposed	Compliance
Car Parking	Car parking areas shall be setback a minimum of 3m from the front boundary and any secondary boundary.	6.6m from front boundary	Yes
	Medical facilities: one space per 25sqm gross floor area. (58 based on 1,454sqm)	Medical centre gross floor area = 1,454sqm. Therefore 58 spaces are required for the medical centre.	
	Childcare centre - A minimum of one car parking space shall be provided for every four children approved to attend the child care centre (33 based on 130 children).	The childcare centre requires 33 spaces.	
	Café - 1.5 spaces per 10sqm (seven based on 46sqm).	The development requires a total of 98 spaces. 83 spaces are proposed.	No, see discussion above
	Off street parking and loading shall be designed in accordance with Australian Standards 2890.1 and 2 (as amended), except as otherwise provided by this Plan.	Compliance can be achieved, with only minor modifications needed to kerbs within car park to allow for truck manoeuvring, which could be conditioned if the application were to be approved.	Yes
	No required car parking space shall be designed in a stacked configuration.	No stacked car parking is proposed.	Yes
	Pedestrian access shall be separated from vehicular access with clearly defined paths to and from the building.	Separate pedestrian entry provided.	Yes
	Each site shall have a maximum of one ingress and one egress driveway.	One ingress and one egress driveway proposed.	Yes
	The minimum width of a driveway shall be: i) 3m for one way traffic movement and ii) 6m for two way traffic movement.	Both proposed one way driveways are 5m wide. No two-way driveways	Yes

Control	Required	Proposed	Compliance
		are proposed.	
	Driveways shall be located a minimum distance of 6m from the tangent point of any un-signalled intersection.	No driveways are proposed near an intersection.	Yes
	Sufficient space shall be provided on site so that no vehicle shall be required to make more than a three-point turn to exit the site in a forward direction.	No vehicle would be required to make more than a three-point turn to exit the site in a forward direction.	Yes
	All car parking spaces shall be line marked and delineated with appropriate signage and pavement marking.	Condition of consent requires line-marking.	Yes
	Development applications child care centres catering for 20 or more children shall include a Traffic Impact Statement, prepared by a suitably qualified person addressing the following criteria: i) the existing traffic environment ii) anticipated traffic generation from the proposed development iii) the potential cumulative impact on the locality iv) the need for local traffic improvements in the locality v) traffic egress/ ingress and vi) sight distance and other relevant safety issues including vehicular / pedestrian movements.	A Traffic Impact Statement has been provided, and was referred to Council's Traffic section for review. The proposed development was found to be satisfactory from a traffic perspective, subject to the installation of a 'No Right Turn' facility from Lind Street into Jenner Street, widening and reconstruction of Part of Lind Street, installation of footpaths, provision of traffic calming devices in Edward Edgar Street, and signage reinforcing internal traffic movement directions. The developer would be responsible for supplying these facilities.	Yes

Control	Required	Proposed	Compliance
Emergency Evacuation	Development applications for child care centres catering for 20 or more children shall include an Emergency Evacuation Plan prepared by a suitably qualified person in accordance with Australian Standard 3745 Emergency Control Organization and Procedures for Buildings, Structures and Workplaces (as amended), addressing: i) the mobility of children and how this is to be accommodated during an evacuation ii) the location of a safe congregation area, away from the evacuated building, busy roads, other hazards and the evacuation points of other residents or tenants within the building iii) where the child care centre is part of a larger building or complex, that the emergency evacuation plan for the child care centre is complementary and consistent with other emergency evacuation plans for the complex and iv) the supervision of children during an evacuation and at the safe congregation area, giving regard to the capacity of the child care centre and its approved child: staff ratios.	An Emergency Plan was not provided, however if the application were to be approved, a condition of consent could require such a plan to be provided prior to issue of the Construction Certificate.	Satisfactory
Landscaping	Landscaping shall be provided to a minimum of a: i) 3m wide strip along the primary and secondary	3m landscaping strip provided.	Yes

Control	Required	Proposed	Compliance
	street frontage (other than vehicle driveways); and		
	ii) 1.5m wide strip along the full width of side and rear setbacks.	Proposed boundary landscaping would be at least 1.5m.	Yes
	Native mature trees on site shall be retained.	Some native mature trees are proposed to be removed however these have been identified in an arborist report as being of moderate retention value only. All of the trees identified as being of high retention value (the four fig trees) would be retained.	Yes
	Development applications for child care centre shall include a Landscape Plan and report, prepared by a suitably qualified person addressing the following: i) species, location and mature height of proposed planting ii) location of play equipment iii) separation from car parking spaces and driveway areas iv) fencing height and materials and v) surfaces (sand, grass or the like).	A landscape plan has been submitted with the application, which includes all of the required information.	Yes
	All existing vegetation on the site and on adjoining sites shall be assessed to ensure that the plants: i) are not toxic or dangerous (refer to Appendix 14 for a list of Unsuitable Plant Species) and	This matter could be addressed by way of a condition of consent, if approval were to be granted.	Yes

Control	Required	Proposed	Compliance
	ii) do not impose a safety hazard such as personal injury from falling branches and seeds, poisoning and/or choking.		
Play Areas	Child care centre play areas shall:		
	i) comply with the Children (Education and Care Services) Supplementary Provisions Regulation 2004 (as amended)	Complies	Yes
	ii) be appropriately designed and located to minimise noise impacts to adjoining properties and	Complies	Yes
	iii) be naturally lit and ventilated.	Complies	Yes
	The siting of outdoor play areas shall:		
	i) be located on a predominantly flat gradient	Complies	Yes
	ii) allow direct supervision from within the centre and	Complies	Yes
	iii) provide adequate fencing.	Complies	Yes

a. Site location

Part 8 of the SCDCP states that childcare centres must not be located on an allotment that is within a no-through road. The subject site is located at the terminus of Lind Street, and therefore the subject site fails to satisfy this aspect of the locational criteria for childcare centres. The reason for this standard is to prevent vehicular conflict and parking difficulties in residential cul-de-sacs, where on-street parking spaces are not easily manoeuvred into and out of and drop-off/collection of children can cause significant amenity issues for surrounding residents. In the present case however, the site is far larger than a typical site that would accommodate a typical childcare centre. The development would have a separate vehicular entry and exit point and would have enough on-site car parking to accommodate all vehicle movements associated with the childcare centre. In this regard, the subject site is not considered to be inappropriate for a childcare centre, and this should not form a reason for refusal.

b. Number of children

Part 8 of the SCDCP states that a maximum of 50 children shall occupy a child care centre on any single allotment. The proposed childcare centre would have 130 children and therefore fails to comply with this control. However, owing to the size of the site, which is far larger than a typical site that would accommodate a typical childcare centre, the proposed childcare centre would be able to provide the amount of indoor and outdoor play space required by the applicable state regulations for the number of children proposed. The site would also be able to accommodate all of its associated vehicle parking demand on site, as well as all drop-off and pick-up movements (which smaller childcare centres do not typically do), thereby avoiding impacts on the surrounding locality with respect to traffic. In addition, the outdoor play space would be more than 20 metres from the nearest residence, and an acoustic report has determined that it would not have a detrimental impact upon the adjoining residences. In this regard, the number of children to be accommodated at the proposed child care centre is not considered to be inappropriate having regard to the size of the site, and this should not form a reason for refusal.

3. Public Participation

The application was publicly exhibited and notified to surrounding property owners for a period of 14 days. The application was re-notified to surrounding property owners upon receipt of amended plans. Council has received submissions in response to the exhibition and notification of the application from the residents of 12 properties. The matters raised within the submissions are discussed below:

Objection – The proposed development would detrimentally affect the character of the site, the curtilage of Redfern's cottage, and the view lines to and from the cottage.

Comment – This reason for objection is considered to be valid as discussed previously within this report.

Objection – An archaeological assessment should be done prior to any works commencing.

Comment – This objection is considered to be valid (as discussed previously within this report), and Council officers and the independent heritage consultant are of the view that a detailed archaeological assessment must be undertaken prior to any proposal being approved for the site, as any archaeological finds may require design changes.

Objection – The building should be restored to its original form, with its original windows and doors.

Comment – The application proposes to restore Redfern's Cottage to its original form, by restoring its original floor plan and using materials sympathetic to the cottage's original fabric to restore its exterior elements. This aspect of the proposal is supported by Council officers and the independent heritage consultant.

Objection – The proposed medical centre/pharmacy would have a detrimental economic impact upon other medical businesses within the Minto area.

Comment – Financial impacts upon trade competitors resulting from increased competition as a consequence of a development proposal is not in itself a valid planning reason for refusal of a development application. This principle has been established by the judgements arising from the Land and Environment Court. Consequently, the fact that there may be a potential for some negative financial impact upon other existing medical businesses within Minto as a result of the proposed development would not be a valid reason for Council to refuse the subject application. The Land and Environment Court has previously established that "…the mere threat of competition to existing businesses, if not accompanied by a prospect of a resultant overall adverse effect upon the extent and adequacy of facilities available to the local community if the development be proceeded with, will not be a relevant town planning consideration". In this regard, there is no evidence to suggest that the financial impacts upon other medical centres within Minto would be so severe as a result of the proposed development as to force their closure and cause an overall decline in available medical facilities for the community, particularly given the recent population growth and community renewal that has taken place within Minto generally.

Objection – The development would cause traffic problems in the vicinity of the site as the surrounding streets are too narrow, and the increased traffic would cause safety problems.

Comment – If the application were to be approved, the developer would be required to make the following improvements to the local road network:

- widening and reconstruction of part of Lind Street
- installation of a 'No Right Turn' facility from Lind Street into Jenner Street
- construction of footpaths
- provision of traffic calming devices in Edward Edgar Street (subject to Local Traffic Committee approval).

In this regard, subject to the above measures being undertaken, the proposed development should not cause traffic problems within the local road network.

Objection – The proposed development would cause an increase in noise for surrounding residents.

Comment – An acoustic report prepared by qualified acoustic consultant was submitted with the application. The report concluded that the childcare centre would only marginally increase the background noise levels experienced at the boundary of the most affected residential property, and compliance with the requirements of the NSW Industrial Noise Policy and the SCDCP would be achieved. The report was referred to Council's Environmental Health Officers, who provided recommended conditions of consent to be imposed if the application were to be approved, to assist in mitigating any noise pollution issues. Therefore, any increase in noise experienced by surrounding residents would not be likely to detrimentally affect the amenity of the surrounding residential neighbourhood.

Objection – The proposed development would lead to an increase in crime within the area.

Comment – No evidence has been submitted to substantiate the claim that the proposed development would lead to an increase in crime within the area.

Objection – The proposed development would change the character of the surrounding residential neighbourhood.

Comment – Whilst the proposed development is non-residential in nature, it is permissible on the subject site. Assessment of the application has found that the potential amenity impacts primarily being noise and traffic could be mitigated with appropriate ameliorative measures. Accordingly, whilst there may be some changes to noise and traffic levels as a result of the proposed development, the residential character of the local area could reasonably be expected to be maintained.

4. Conclusion

The proposed redevelopment of the grounds of Redfern's Cottage and the restoration of the cottage itself is a worthy proposition, and is in fact critical to the site's long-term preservation, activation and appreciation. However, whilst this is the case, Council need not support any redevelopment proposal for this reason alone and need not allow the building's heritage value to be diminished on the pretext that such an action would ensure the building's survival. Council can and should insist upon a development outcome for the site that appropriately addresses and respects the site's significant historical setting and views to and from it.

It is considered that the current proposal would result in an unreasonable and adverse impact on the heritage-listed cottage, given that the proposed siting of buildings gives insufficient regard to public views to and from the cottage and would inhibit the building's original form and context from being appreciated and interpreted authentically. In addition, the current proposal does not give Council certainty that the best conservation outcome for the site would be achieved, given the absence of a detailed archaeological study and the conflicting/inadequate plans that have been provided in respect of the use of the cottage.

Notwithstanding the above, the subject proposal involves land uses that are considered to be generally appropriate for the site and the proposal complies with the majority of applicable planning legislation and policies. Consequently, the applicant was encouraged to consider alternative siting of buildings for these land uses, which would ideally be guided and informed by any relevant archaeological findings so as to preserve as much of the site's heritage value as possible. However, to date the applicant has failed to provide the Council with the results of a detailed archaeological study which would allow a more in depth assessment of the application, nor has the applicant made any further amendments to the proposal.

The applicant has requested that Council determine the application on the basis of the plans and information submitted. Accordingly, for the reasons discussed within this report and listed specifically in Attachment 1, it is recommended that the application be refused.

Officer's Recommendation

That development application No. 2952/2014/DA-C for the construction of a medical centre and childcare centre with associated car parking at No. 20 Lind Street, Minto be refused for the reasons for refusal listed in Attachment 1 to this report.

Committee Note: Mr Jones, Ms Stasiuk, Mr Prestia, Ms Leung, Dr Wan, Mr Mondal and Ms Andrews addressed the Committee in opposition to the development.

Mr Hayek and Mr Lonergan addressed the Committee in favour of the development.

Committee's Recommendation: (Thompson/Lound)

That the Officer's Recommendation be adopted.

CARRIED

Voting for the Committee's Recommendation were Councillors: Greiss, Hawker, Kolkman, Lound, Oates, Rowell and Thompson.

Voting against the Committee's Recommendation: Nil.

Council Meeting 22 March 2016 (Greiss/Kolkman)

That development application No. 2952/2014/DA-C for the construction of a medical centre and childcare centre with associated car parking at No. 20 Lind Street, Minto be refused for the reasons for refusal listed in Attachment 1 to this report.

Council Resolution Minute Number 31

That development application No. 2952/2014/DA-C for the construction of a medical centre and childcare centre with associated car parking at No. 20 Lind Street, Minto be refused for the reasons for refusal listed in Attachment 1 to this report.

Voting for the Council Resolution were Councillors: Borg, Brticevic, Chanthivong, Dobson, Glynn, Greiss, Hawker, Kolkman, Lake, Lound, Matheson, Oates, Rowell and Thompson.

Voting against the Council Resolution was Councillor: Mead.

ATTACHMENT 1

Recommended reasons for refusal

You are advised that the subject application has been refused for the following reasons:

1. Adverse Environmental Impact

Pursuant to the provisions of Section 79C(1)(b) of the *Environmental Planning and Assessment Act 1979*, it is considered that the development would have an adverse impact upon the environment as the application does not properly consider the relationship of the proposed new buildings to Redfern's Cottage, including the potentially adverse impact of the provision of ramps and fencing around the cottage, which would inhibit the building's original form and context from being appreciated and interpreted authentically.

2. Adverse Environmental Impact

Pursuant to the provisions of Section 79C(1)(b) of the *Environmental Planning and Assessment Act 1979*, it is considered that the development would have an adverse impact upon the environment with respect to views to and from Redfern's Cottage. The impact of the proposal on significant views to and from the cottage (including public views to the cottage) has not been taken into account in designing the proposal. The proposed development which would obscure the north elevation of the cottage (original front elevation) is not acceptable, and adequate separation has not been provided between the cottage and the proposed new buildings on the site.

3. Inconsistent with Campbelltown (Urban Area) LEP 2002

Pursuant to the provisions of Section 79C(1)(a)(i) of the *Environmental Planning and Assessment Act 1979*, it is considered that the proposed development is inconsistent with Campbelltown (Urban Area) Local Environmental Plan 2002 as a detailed archaeological assessment of the site has not been undertaken. Therefore, Council cannot determine whether any significant existing elements at the site would be retained and protected, as the proposal would necessitate the removal of such elements.

4. Conflicting/Unclear Information

Pursuant to the provisions of Section 79C(1)(a)(iv), conflicting and inadequate plans and information have been put forward concerning the intended use of and works to Redfern's Cottage, which do not allow the application to be properly considered.

5. Failure to Demonstrate Compliance with the Building Code of Australia

Pursuant to the provisions of Section 79C(1)(a)(iv), the plans fail to demonstrate that toilet facilities for patrons and staff of the proposed café would be provided as required by the Building Code of Australia.

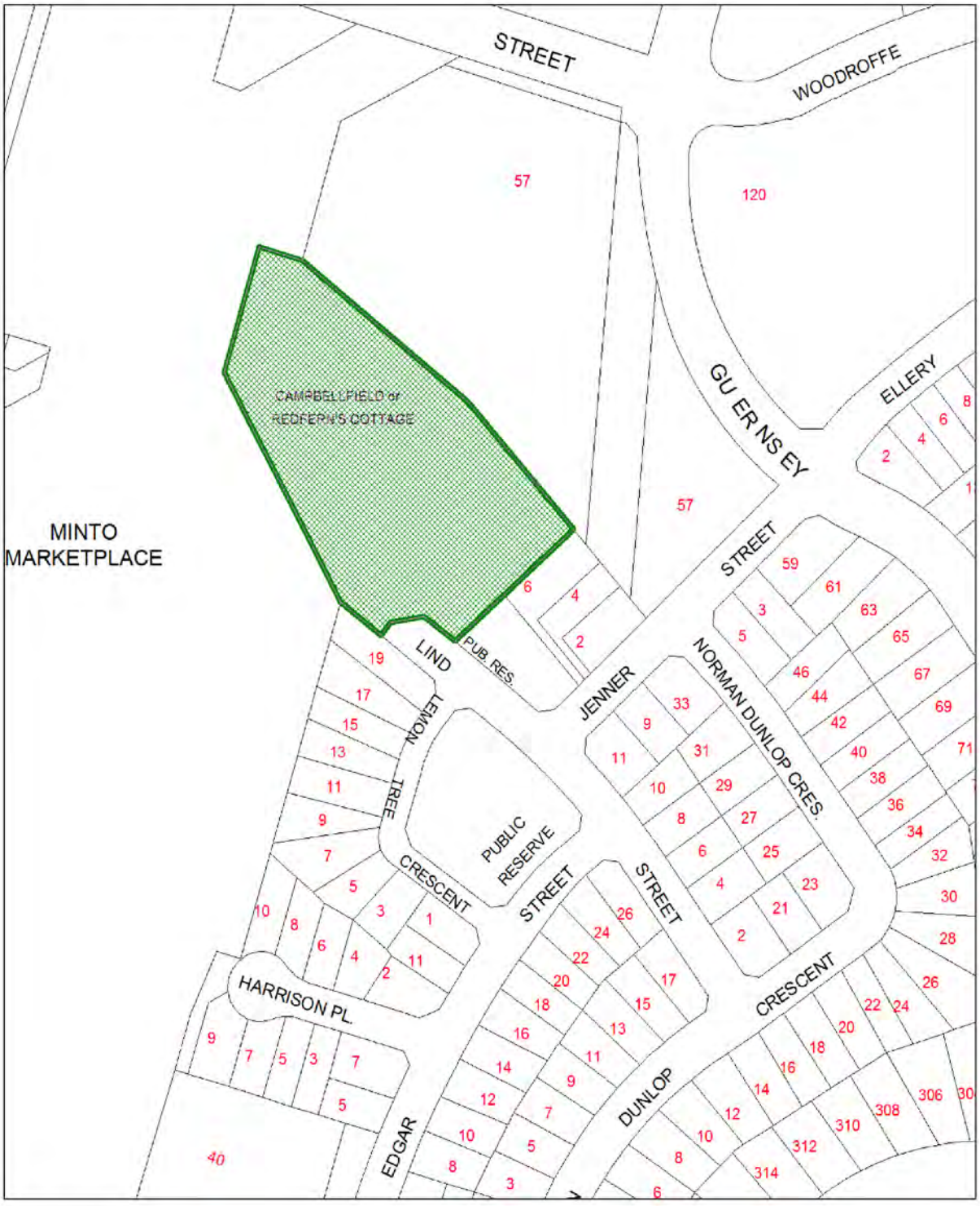
6. Public Interest

Pursuant to the provisions of Section 79C(1)(e) of the *Environmental Planning and Assessment Act 1979*, it is considered that in the circumstances of the case, approval of the development would set an undesirable precedent for similar inappropriate development and is therefore not in the public interest.

ATTACHMENT 2

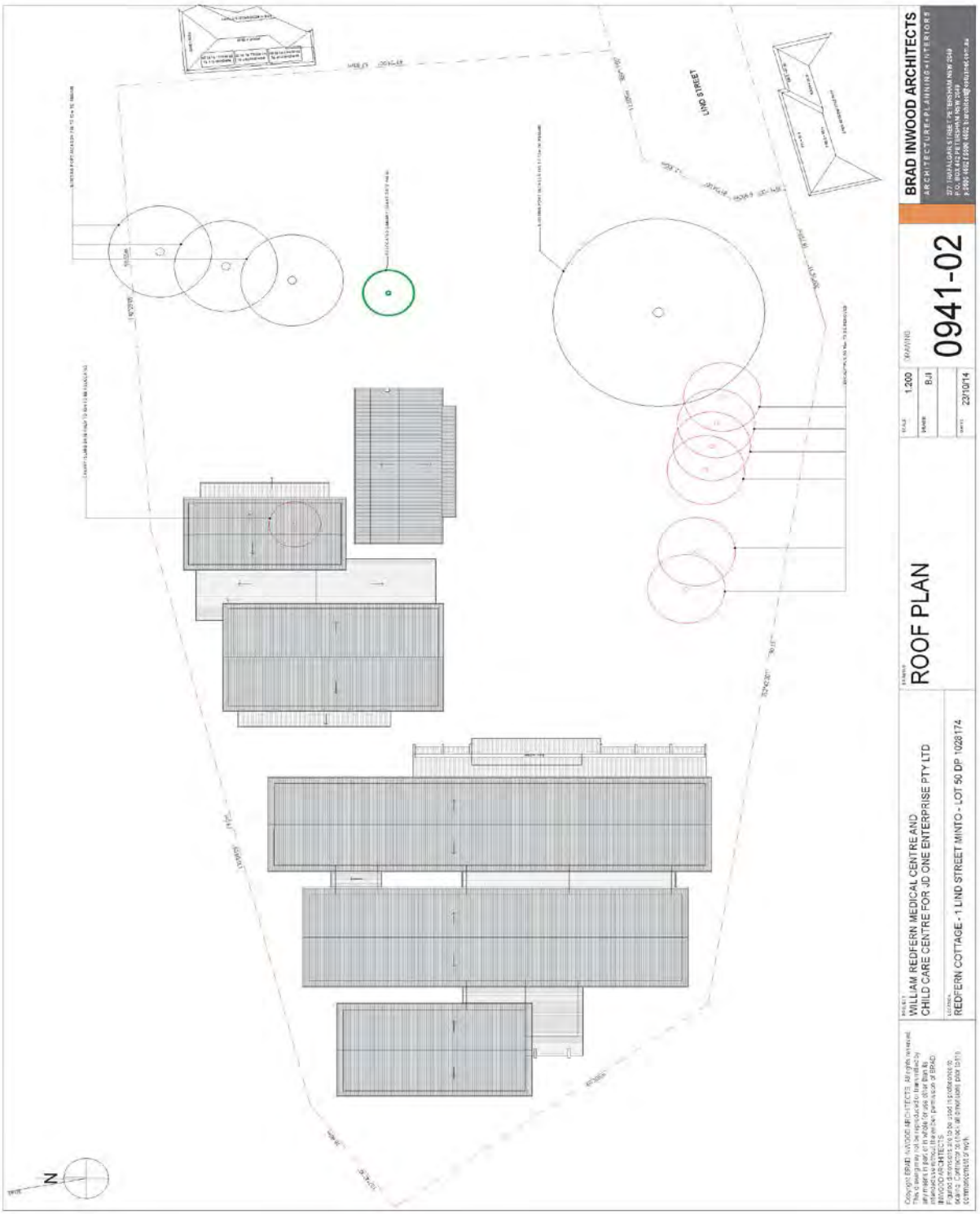
Locality Plan

No. 20 Lind Street, Minto



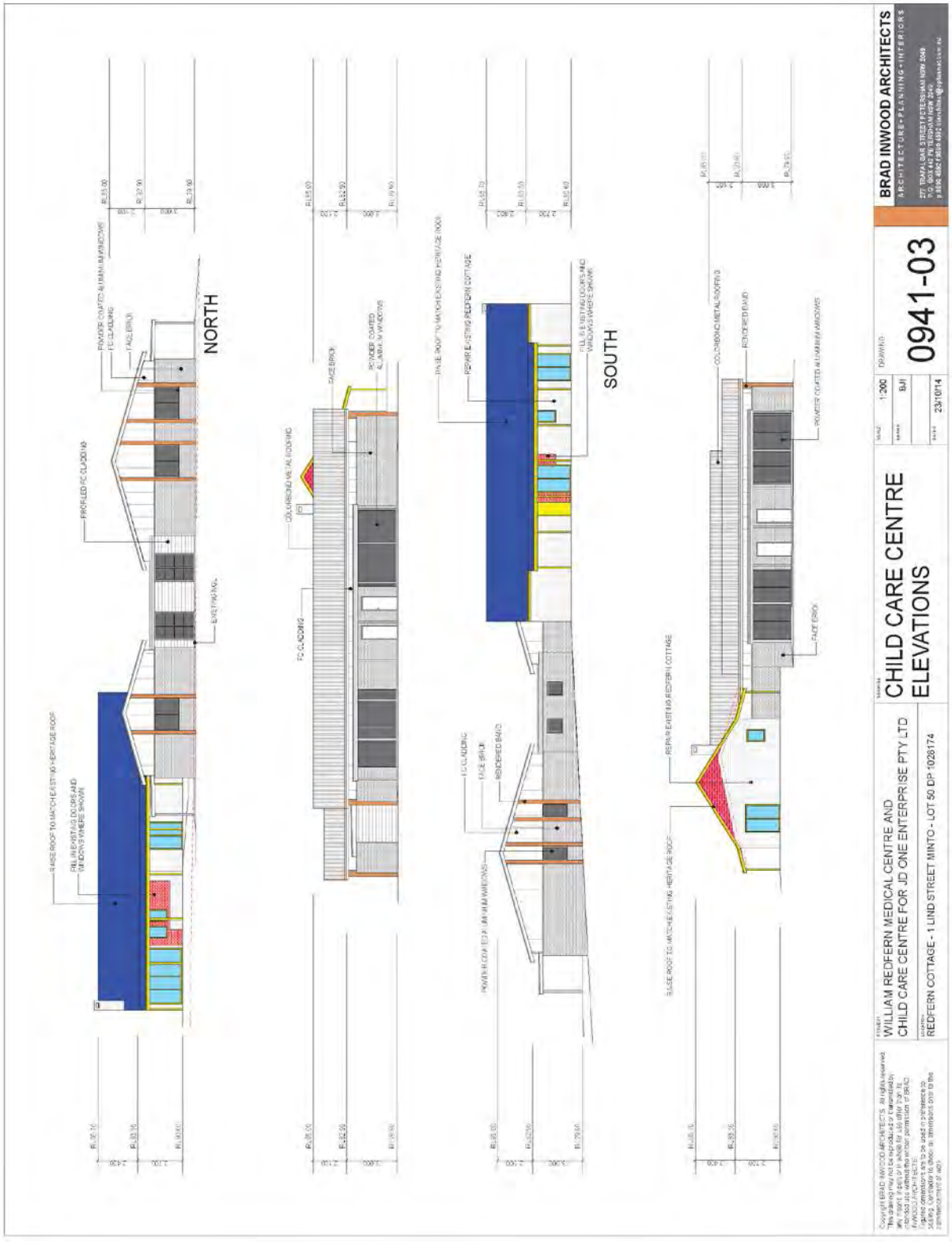
ATTACHMENT 3

Roof Plan



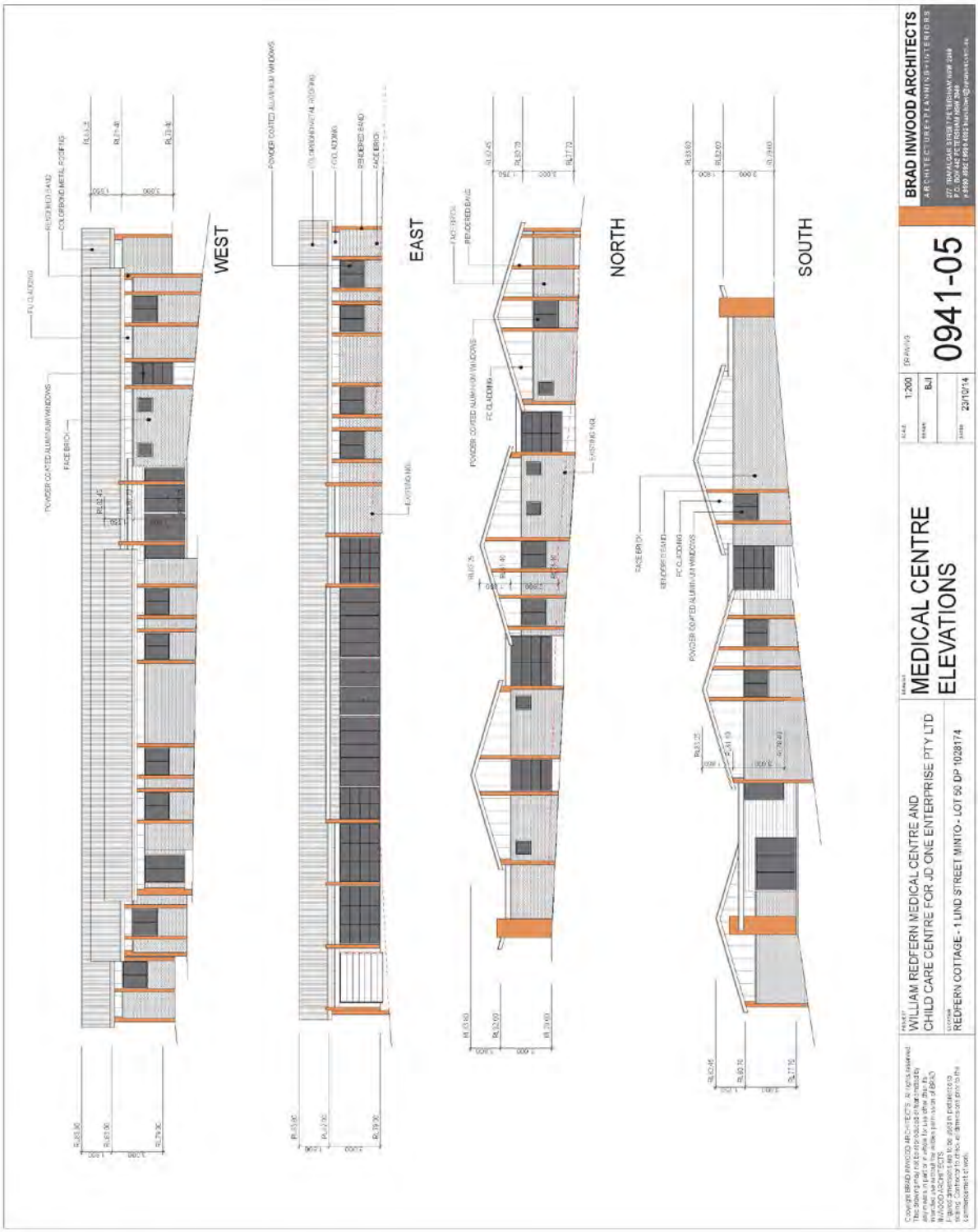
ATTACHMENT 4

Childcare Centre Elevations



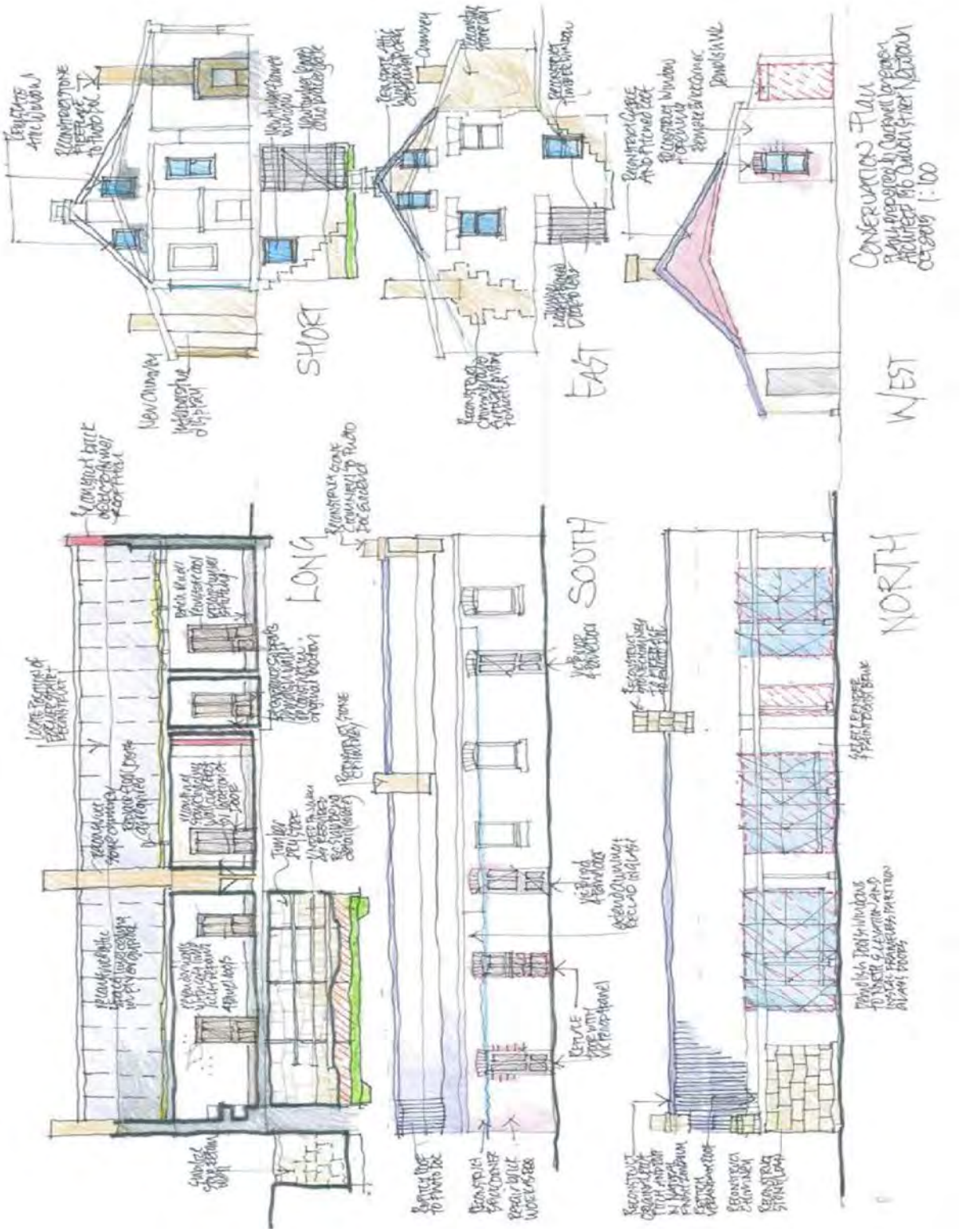
ATTACHMENT 5

Medical Centre Elevations

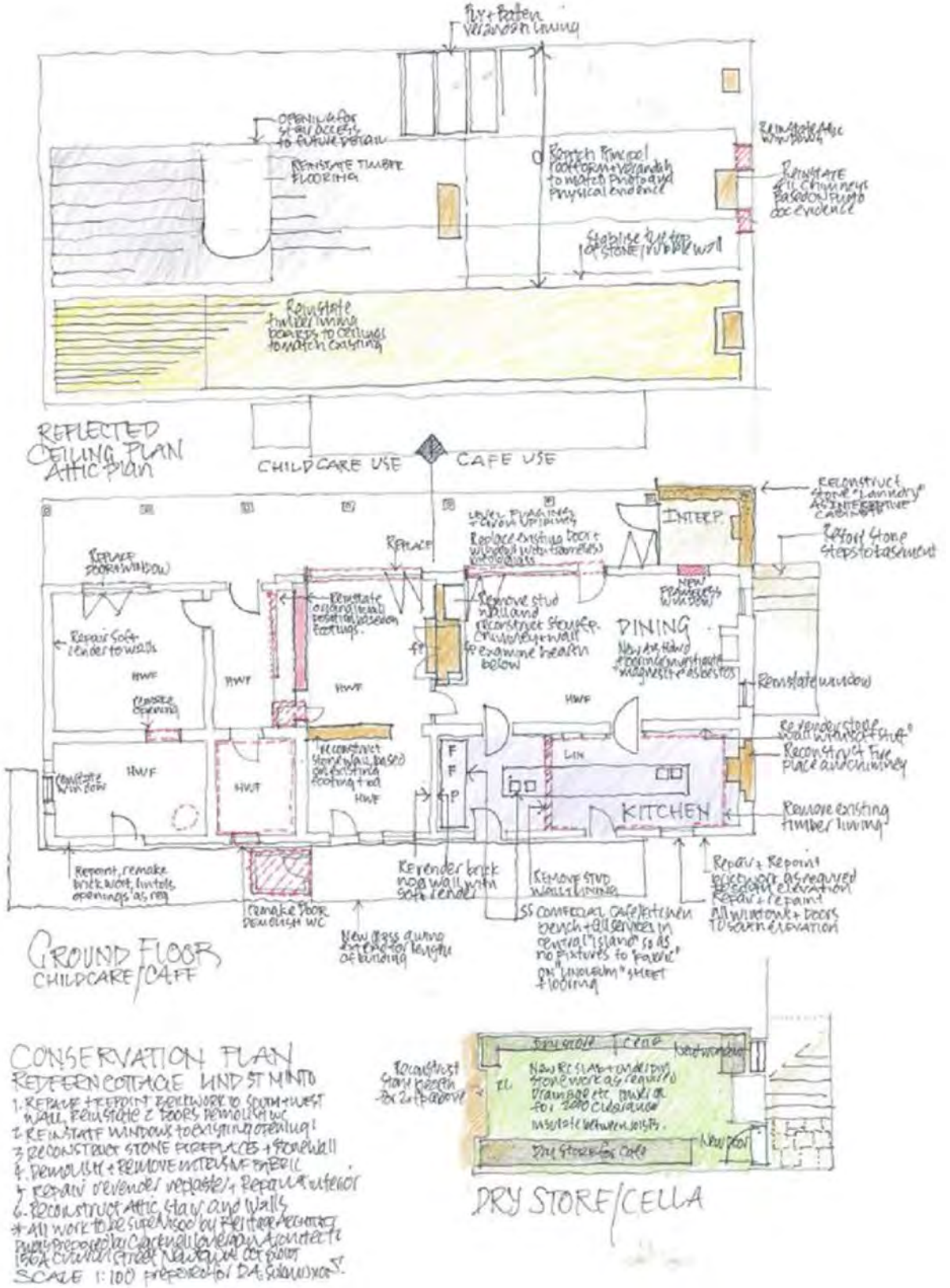


ATTACHMENT 6

Plans of Proposed Works to Cottage



Plans of Proposed Works to Cottage Continued



ATTACHMENT 7

Perspective Drawings

1 LIND STREET MINTO WILLIAM REDFERN MEDICAL CENTRE, CAFE AND CHILD CARE CENTRE	CW Designs Unit 1/195 Regent Street Redfern NSW 2016 Mob 0412 739 669 ABN 11 134 917 918

1 LIND STREET MINTO WILLIAM REDFERN MEDICAL CENTRE, CAFE AND CHILD CARE CENTRE	CW Designs Unit 1/195 Regent Street Redfern NSW 2016 Mob 0412 739 669 ABN 11 134 917 918

Perspective Drawings Continued

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Perspective Drawings Continued

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4. COMPLIANCE SERVICES

4.1 Legal Status Report

Reporting Officer

Manager Compliance Services

Attachments

Planning and Environment Division Monthly Legal Matters Status and Costs Summary (contained within this report)

Purpose

To update Council on the current status of the Planning and Environment Division's legal matters.

Report

This report contains a summary of the current status of the Division's legal matters for the 2015-2016 period as they relate to:

- The Land and Environment Court
- The Supreme Court
- The District Court
- The Local Court
- Matters referred to Council's solicitor for advice.

A summary of year-to-date costs and the total number of matters is also included.

Note: The year to date cost totals itemised in sections one to seven inclusive of the report do not necessarily correlate with the costs to date total of individual matters listed in each section, as the costs to date total of individual matters shown refer to total costs from commencement of the matter, which may have commenced before 1 July.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: **(Rowell/Kolkman)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Greiss/Kolkman)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 27

That the Officer's Recommendation be adopted.

ATTACHMENT 1

1.	Land and Environment Court Class 1 Matters – Appeals Against Council's Determination of Development Applications

Total ongoing Class 1 DA appeal matters (as at 23/02/2016)	**1**
Total completed Class 1 DA appeal matters (as at 23/02/2016)	**3**
Costs from 1 July 2015 for Class 1 DA appeal matters:	**$100,382.70**

1 (a)	**Multiplan Constructions Pty Ltd**
Issue:	An appeal against Council's refusal of development application No. 2775/2014/DA-MAH that sought consent for the construction of nine two-storey dwellings and associated strata subdivision.
Property:	Lot 36 DP 13118, 17 Lyndia Street, Ingleburn.
Property Owner:	Mr Ramy Maher Youssef and Mrs Nevine Magdy Youssef
Council File:	Development Application No: 2775/2014/DA-MAH
Court Application:	Filed on 22 September 2015 - File No. 10848 of 2015
Applicant:	Multiplan Constructions Pty Ltd
Costs Estimate:	$40,000.00 (exclusive of Barristers, Court Appointed Experts or disbursement fees)
Costs to date:	$24,070.67
Status:	Ongoing – proceedings listed for hearing on 29 April 2016.
Progress:	The Applicant filed an appeal in the Land and Environment Court of NSW against Council's refusal of development application No. 2775/2014/DA-MAH that sought consent for the construction of nine two-storey dwellings and associated strata subdivision. On 22 October, the proceedings were adjourned to 23 November 2015 for a section 34 conciliation conference. At the conclusion of the section 34 conciliation conference held on 23 November 2015, the applicant agreed to make some amendments to the application as discussed. The Commissioner made certain procedural directions and listed the matter for telephone callover on 16 December 2015. At the telephone callover on 16 December 2015, the Registrar adjourned the proceedings to 10 February 2016 for a section 34 conciliation conference so as to allow Council time to assess the amended plans submitted by the applicant. The matter was before the Court for section 34 conciliation

	conference on 10 February 2005. A number of issues were identified which would necessitate amended plans, which the applicant intends to rely on, being prepared by the applicant and re-advertised by Council. The Commissioner terminated the conciliation conference and adjourned the proceedings for further callover on 18 February 2016 at which time the matter will be listed for either contested hearing or consent orders hearing. At the callover on 18 February 2016 the Registrar made certain procedural directions concerning the applicant's intention to rely on amended plans and the need for Council to prepare amended facts and contentions in the matter. The Registrar listed the proceeding for hearing commencing onsite at 10:00am on 29 April 2016. The objectors to the development will be advised in writing of the hearing listing. Given that the proposed development involves the broader issues of affordable rental housing and community concerns surrounding the application of the relevant standards under the Affordable Rental Housing SEPP, Council's solicitor will be instructing Counsel for the hearing.

2.	**Land and Environment Court Class 1 and 2 Matters – Appeals Against Notices, Orders, or Directions issued by Council**

Total ongoing Class 1 and 2 appeal matters (as at 23/02/2016)	**0**
Total completed Class 1 and 2 appeal matters (as at 23/02/2016)	**2**
Costs from 1 July 2015 for Class 1 & 2 appeal matters:	**$1,578.13**

3.	**Land and Environment Court Class 4 Matters – Civil Enforcement in respect of non-compliance with Planning Law or Orders issued by Council**

Total ongoing Class 4 matters before the Court (as at 23/02/2016)	**0**
Total completed Class 4 matters (as at 23/02/2016)	**0**
Costs from 1 July 2015 for Class 4 matters	**$570.00**

4.	Land and Environment Court Class 5 - Criminal enforcement of alleged pollution offences and various breaches of environmental and planning laws	
	Total ongoing Class 5 matters before the Court (as at 23/02/2016)	0
	Total completed Class 5 matters (as at 23/02/2016)	0
	Costs from 1 July 2015 for Class 5 matters	$0.00

5.	Land and Environment Court Class 6 - Appeals from convictions relating to environmental matters	
	Total ongoing Class 6 matters (as at 23/02/2016)	0
	Total completed Class 6 matters (as at 23/02/2016)	0
	Costs from 1 July 2015 for Class 6 matters	$0.00

6.	Supreme Court of NSW – Contractual proceedings with WSN Environmental Solutions concerning South West Sydney Councils Resource Recovery Project	
	Total ongoing matters (as at 23/02/2016)	0
	Total completed (as at 23/02/2016)	1
	Costs contribution from 1 July 2015 for this matter	$35,330.23

7.	Local Court prosecution matters The following summary lists the current status of the Division's legal matters before the Campbelltown Local Court.	
	Total ongoing Local Court Matters (as at 23/02/2016)	3
	Total completed Local Court Matters (as at 23/02/2016)	40
	Costs from 1 July 2015 for Local Court Matters	$5,955.66

File No: **Offence:** **Act:**	LP52/15 – Penalty Notice Court Election Own dog that attacked animal. *Companion Animals Act 1998*
Final Costs:	$0.00 – Matter dealt with by Council's Legal and Policy Officer in conjunction with the Police Prosecutor.
Status:	Completed – Fine imposed
Progress:	Listed for first mention on 17 November 2015. On 17 November 2015 the matter was adjourned by consent to 15 December 2015 for further mention. On 15 December 2015 the matter was adjourned by consent to 2 February 2016 for plea/mention. The matter was before the Court for plea/mention on 2 February 2016 where the defendant, Duc Van Nguyen, entered a guilty plea by written notice of pleading. After hearing the evidence and submissions the Magistrate found the offence proved, and imposed a $1,200.00 fine.

File No: **Offence:** **Act:**	LP54/15 – Penalty Notice Court Election Own dog that attacked animal. *Companion Animals Act 1998*
Final Costs:	$0.00 – Matter dealt with by Council's Legal and Policy Officer in conjunction with the Police Prosecutor.
Status:	Completed – Fine imposed
Progress:	Listed for first mention on 17 November 2015. On 17 November 2015 the matter was adjourned by consent to 15 December 2015 for further mention. On 15 December 2015 the matter was adjourned by consent to 2 February 2016 for plea/mention. The matter was before the Court for plea/mention on 2 February 2016 where the defendant, Jacqueline Nguyen, entered a guilty plea by written notice of pleading. After hearing the evidence and submissions the Magistrate found the offence proved, and imposed a $1,200.00 fine.

File No:	LP01/16 – Penalty Notice Court Election
Offence:	Stop in bus zone (school-zone)
Act:	*Road Rules 2014*
Final Costs:	$0.00 – Matter dealt with by Council's Legal and Policy Officer in conjunction with the Police Prosecutor.
Status:	Completed. Fine and costs imposed.
Progress:	The matter was before the Court for first mention on 1 March 2016 where the defendant Juliet Bernedette Clark entered a guilty plea. After considering the facts and submissions, the Magistrate found the offence proved and convicted the defendant, imposing a $75 fine and an order for Court costs of $160.

File No:	LP02/16 – Penalty Notice Court Election
Offence:	Stop in bus zone
Act:	*Road Rules 2014*
Final Costs:	$0.00 – Matter dealt with by Council's Legal and Policy Officer in conjunction with the Police Prosecutor.
Status:	Completed - Fine and court costs imposed
Progress:	Matter was before the Court for first mention on 23 February 2016 where the defendant Jacob Samuel entered a guilty plea with explanation. After considering the facts and submission the Magistrate imposed a $20 fine and order for $85 Court costs.

File No:	LP03/16 – Penalty Notice Court Election
Offence:	Disobey no-stopping sign (school-zone)
Act:	*Road Rules 2014*
Costs to date:	$0.00 – Matter being dealt with by Council's Legal and Policy Officer in conjunction with the Police Prosecutor.
Status:	New Matter
Progress:	Listed for first mention on 8 March 2016.

8. Matters referred to Council's solicitor for advice

Matters referred to Council's solicitors for advice on questions of law, the likelihood of appeal or prosecution proceedings being initiated, and/or Council liability.

Total Advice Matters (as at 23/02/2016)	**3**
Costs from 1 July 2015 for advice matters	**$6,155.46**

9. Legal Costs Summary

The following summary lists the Planning and Environment Division's net legal costs for the 2015/2016 period.

Relevant attachments or tables	Costs Debit	Costs Credit
Class 1 Land and Environment Court - appeals against Council's determination of Development Applications	$100,382.70	$0.00
Class 1 and 2 Land and Environment Court - appeals against Orders or Notices issued by Council	$1,578.13	$0.00
Class 4 Land and Environment Court matters - non-compliance with Council Orders, Notices or prosecutions	$570.00	$0.00
Class 5 Land and Environment Court - pollution and planning prosecution matters	$0.00	$0.00
Class 6 Land and Environment Court - appeals from convictions relating to environmental matters	$0.00	$0.00
Supreme Court hearing and appeal matters	$35,330.23	$0.00
District Court appeal matters	$0.00	$0.00
Local Court prosecution matters	$5,955.66	$100.00
Matters referred to Council's solicitor for legal advice	$6,155.46	$0.00
Miscellaneous costs not shown elsewhere in this table	$0.00	$0.00
Costs Sub-Total	$149,972.18	$100.00
Overall Net Costs Total (GST exclusive)	**$149,872.18**	

5. GENERAL BUSINESS

5.1 Gregory Hills Drive

Committee's Recommendation: (Kolkman/Oates)

That a report be presented to Council that identifies and analyses the impacts of the proposed extension of Gregory Hills Drive and the associated South West Growth Centre development to link with Badgally Road, on the capacity, efficiency and safety of Badgally Road. Such report to present options to accommodate the efficient, safe and environmentally acceptable upgrade of Badgally Road to facilitate an appropriate road and public transport connection between the South West Growth Centre and the Campbelltown Regional City Centre.

CARRIED

Council Meeting 22 March 2016 (Greiss/Kolkman)

That the Committee's Recommendation be adopted.

Council Resolution Minute Number 27

That the Committee's Recommendation be adopted.

5.2 Pool to Pond

Committee's Recommendation: (Greiss/Rowell)

That a report be presented outlining the feasibility of Campbelltown City Council implementing a pool to pond program similar to that being offered by Ku-ring-gai Council.

CARRIED

Council Meeting 22 March 2016 (Greiss/Kolkman)

That the Committee's Recommendation be adopted.

Council Resolution Minute Number 27

That the Committee's Recommendation be adopted.

Confidentiality Motion: (Thompson/Kolkman)

That the Committee in accordance with Section 10A of the *Local Government Act 1993,* move to exclude the public from the meeting during discussions on the items in the Confidential Agenda, due to the confidential nature of the business and the Committee's opinion that the public proceedings of the Committee would be prejudicial to the public interest.

CARRIED

21. CONFIDENTIAL ITEMS

21.1 Confidential Report Directors of Companies

Reason for Confidentiality

This report is **CONFIDENTIAL** in accordance with Section 10A(2)(c) of the *Local Government Act 1993*, which permits the meeting to be closed to the public for business relating to the following: -

(c) information that would, if disclosed, confer a commercial advantage on a person with whom the council is conducting (or proposes to conduct) business

21.2 Heritage Medallion 2016

Reason for Confidentiality

This report is **CONFIDENTIAL** in accordance with Section 10A(2)(d) of the *Local Government Act 1993*, which permits the meeting to be closed to the public for business relating to the following: -

(d) commercial information of a confidential nature that would if disclosed:

(iii) reveal a trade secret.

Motion: (Greiss/Rowell)

That the Committee in accordance with Section 10 of the *Local Government Act 1993,* move to re-open the meeting to the public.

CARRIED

There being no further business the meeting closed at 9.34pm.

G Greiss
CHAIRPERSON

Reports of the City Works Committee Meeting held at 7.30pm on Tuesday, 15 March 2016.

APOLOGIES

ACKNOWLEDGEMENT OF LAND

DECLARATIONS OF INTEREST

Pecuniary Interests

Non Pecuniary – Significant Interests

Non Pecuniary – Less than Significant Interests

ITEM	TITLE	PAGE
1.	TECHNICAL SERVICES	3
1.1	Traffic Committee	3
2.	OPERATIONAL SERVICES	29
No reports this round		29
3.	ASSETS AND SUPPLY SERVICES	29
No reports this round		29
4.	EMERGENCY SERVICES	29
No reports this round		29
5.	GENERAL BUSINESS	29
22.	CONFIDENTIAL ITEMS	29
No reports this round		29

Minutes of the City Works Committee held on 15 March 2016

Present

His Worship the Mayor, Councillor P Hawker
Councillor S Dobson (Chairperson)
Councillor F Borg
Councillor G Brticevic
Councillor W Glynn
Councillor P Lake
Councillor C Mead
Director Business Services - Mr M Sewell
Acting Director Community Services - Mrs J Uluibau
Director City Works - Mr W Rylands
Acting Manager Compliance Services - Mr M Donachie
Manager Executive Services - Mr N Smolonogov
Manager Financial Services - Mrs C Mears
Manager Healthy Lifestyles - Mr M Berriman
Manager Information Management and Technology – Ms S Peroumal
Manager Operational Services - Mr A Davies
Manager Property Services - Mr J Milicic
Manager Technical Services - Mr K Lynch
Policy and Governance Coordinator - Ms J Warner
Executive Assistant - Mrs K Peters

Apology **(Glynn/Mead)**

That the apology from Councillor Chanthivong be received and accepted.

CARRIED

Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson Councillor Dobson.

DECLARATIONS OF INTEREST

There were no Declarations of Interest at this meeting.

1. TECHNICAL SERVICES

1.1 Traffic Committee

Reporting Officer

Manager Technical Services

Attachments

1. Minutes of the Local Traffic Committee Meeting held 11 February 2016 (contained within this report)
2. Minutes of the Campbelltown Traffic Committee Meeting held 11 February 2016 (contained within this report)

Purpose

To seek Council's endorsement of the recommendations arising from the Local Traffic Committee and Campbelltown Traffic Committee meeting held on 11 February 2016.

Report

RECOMMENDATIONS OF THE LOCAL TRAFFIC COMMITTEE ON 11 FEBRUARY 2016

Reports Listed for Consideration

LTC 16/1 Farrow Road, Campbelltown - Additional Pedestrian Facility

That Council forward pedestrian counts and traffic volume data to Roads and Maritime Services for consideration in order to meet the warrant criteria for an additional pedestrian facility in Farrow Road, Campbelltown.

LTC 16/2 Plough Inn Road, Leumeah - Additional Accessible Parking

That Council increase the number of accessibility parking spaces from 6 to 10 spaces in the southern Plough Inn Road commuter car park as shown on Plan 12494 Sheet 1A.

General Business

LTC 16/3 Badgally Road - Road Widening Update

That the information be noted.

LTC 16/4 Narellan Road - Lack of Line Markings

That the information be noted.

LTC 16/5 Anthony Drive, Rosemeadow - Speeding Vehicles

1. That the information be noted.

2. That the NSW Police representative advise the resident of the findings of the Highway Patrol.

LTC 16/6 Increased Traffic Volume - Raby Road and Thunderbolt Drive, Raby

That the information be noted.

LTC 16/7 Delegation of Local Traffic Committee

That the information be noted.

RECOMMENDATIONS OF THE CAMPBELLTOWN TRAFFIC COMMITTEE ON 12 FEBRUARY 2016

Reports Listed for Consideration

CTC 16/1 Proposed Events for 2016 - Traffic Management Plan's for Community Events in 2016

1. That Council approve the traffic management plans following events;

• Ingleburn Alive Festival	5 March 2016
• Songkran New year Fete	10 April 2016
• ANZAC Day March	25 April 2016
• NAIDOC Week Street March	3 -10 July 2016
• Chemical Cleanout	July 2016- dates TBA
• Fisher's Ghost Festival	4 – 13 November 2016
• Hollylea Road Festival	13 November 2016
• Christmas Carols	3 December 2016
• New Year's Eve Celebrations	31 December 2016

2. That Council undertakes temporary road closures on affected streets as required for these events.

3. That Council provides on-street advance notice signs of the road closures at least one week prior to the event and liaise with various stakeholders.

4. Council advertise road closure 28 days prior to the event on its website and in local Newspapers.

5. That Council prepare and submit Special Event Traffic Management Plan for the events mentioned within the body of the report to RMS for endorsement.

CTC 16/2 School Zone Flashing Lights

That the information be noted.

Late Items

CTC 16/3 Rose Payten Drive, Minto - Removal of Time Restriction for Qube Logistics A-Double Vehicles

1. That Council approves the removal of the existing time restrictions for a trial period of six months, subject to recommendation 2.

2. That Council advise the applicant that approval is firstly required by Roads and Maritime Services as the Road Manager for state road network.

Officer's Recommendation

That the recommendations of the Local Traffic Committee and Campbelltown Traffic Committee as detailed in the Minutes of the meeting held on 11 February 2016 be adopted.

Committee's Recommendation: (Borg/Brticevic)

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 (Dobson/Borg)

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 32

That the Officer's Recommendation be adopted.

ATTACHMENT 1

LOCAL TRAFFIC COMMITTEE MINUTES

11 February 2016

LOCAL TRAFFIC COMMITTEE

Traffic matters related to the functions delegated to councils under the *Transport Administration Act 1988*.

Minutes Summary

ITEM	TITLE
LOCAL TRAFFIC COMMITTEE MINUTES	
1.	ATTENDANCE
2.	APOLOGIES
3.	CONFIRMATION OF MINUTES
4.	BUSINESS ARISING FROM MINUTES
5.	REPORTS LISTED FOR CONSIDERATION
LTC 16/1	Farrow Road, Campbelltown - additional pedestrian facility
LTC 16/2	Plough Inn Road, Leumeah - additional accessible parking
6.	LATE ITEMS
	No reports this round
7.	GENERAL BUSINESS
LTC 16/3	Badgally Road - Road Widening Update
LTC 16/4	Narellan Road - Lack of Line markings
LTC 16/5	Anthony Drive, Rosemeadow - Speeding Vehicles
LTC 16/6	Increased Traffic Volume - Raby Road and Thunderbolt Drive, Raby
LTC 16/7	Delegation of Local Traffic Committee
8.	DEFERRED ITEMS
	No reports this round

LOCAL TRAFFIC COMMITTEE MINUTES

Traffic matters related to the functions delegated to Councils under the *Transport Administration Act 1988*.

Minutes of the Local Traffic Committee held on 11 February 2016

1. ATTENDANCE

Campbelltown City Council
Councillor Paul Lake (Chairperson)
Manager Technical Services - Mr Kevin Lynch
Coordinator Traffic and Road Design - Mr Ajay Arora
Team Leader Traffic Investigation - Mr Frank Sirc
Administrative Assistant - Mrs Sue Lambert

Roads and Maritime Services
Ms Kaye Russell

Police Representatives
Senior Constable Maree Davies
Sergeant Marcus Cotton

Bus Companies
Interline - Mr Joe Oliveri
Busabout - Mr Stephen Burridge

Representatives of Local Members of Parliament
Mr Ray James

Representatives of Campbelltown Chamber of Commerce
Ms Anne Parnham

Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson Councillor Lake.

2. APOLOGIES

Nil at time of print.

3. CONFIRMATION OF MINUTES

The Minutes of the previous meeting held on 10 December 2015 were recommended by the City Works Committee on 9 February 2016 and adopted by Council on 16 February 2016.

4. BUSINESS ARISING FROM MINUTES

No reports this round

5. REPORTS LISTED FOR CONSIDERATION

LTC 16/1 Farrow Road, Campbelltown - additional pedestrian facility

Previous Report:	LTC 12/54
Electorate:	Campbelltown
Author Location:	Traffic and Road Design Unit

Attachments

Plan 12795 Concept Plan Farrow Road proposed pedestrian facility

Background (11/2/2016)

Council has received representations regarding safety concerns with pedestrian movements across Farrow Road, between Council's Farrow Road western commuter car park and Campbelltown Railway Station. As such, an investigation has been initiated into providing an additional pedestrian crossing and an assessment undertaken on sight distance of pedestrians for motorists using Farrow Road caused by buses parked near to the existing pedestrian crossing.

The commuter parking area, which holds approximately 800 spaces, generates significant pedestrian movements across Farrow Road.

In August 2012, the Farrow Road extension was opened to traffic. This project included an additional car park, footpath connections, on-road accessible parking, maintenance gate/property access to Lot 2 and the removal of informal pedestrian crossing point (pram ramps) across Farrow Road at the northern end of the car park.

In Council's investigations, Council Officers made numerous site visits and installed a CCTV camera to carry out pedestrian observation surveys. The investigations identified the following issues:

a. Despite Council providing a new footpath on the western side of Farrow Road, it was observed that during the morning period, the majority of the pedestrians crossed Farrow Road diagonally over a 50 metre stretch from the northern exit of the car park, not using the western footpath and the marked crossing.

b. In the afternoon period, the majority of pedestrians heading back to the car park did use the footpath on the western side of Farrow Road but crossed diagonally from the bottom of the station stairs (southern). The majority of the commuters did not use the pedestrian crossing.

c. Buses heading north, stopped quite close to the existing pedestrian crossing making it difficult for pedestrians to sight oncoming traffic and traffic to sight pedestrians.

d. Vehicles are using the bus zones on both sides of the road as a drop-off and pick-up point. Many of these vehicles are then performing U-turns, adding to the safety concerns.

As per Australian Standards and Roads and Maritime Services (RMS) Technical Directions, certain criteria have to be met for the installation of a pedestrian crossing in regards to pedestrians and traffic volume. Council Officers carried out a survey observing that in one hour the pedestrian volume (P) was approximately 198 and vehicle volume (V) 537 south of the existing pedestrian crossing in Farrow Road

Council Officers have developed a concept plan (refer attached Plan 12795) which provides for a second formal pedestrian crossing with 2.5m kerb extensions in Farrow Road approximately 50m south of the existing crossing.

The main features of the concept plan are as follows;

1. Installation of an additional formal pedestrian crossing near the southern stairs to the railway station. The reasons in support of this proposal are as follows:

   (a) it is located on the pedestrian desire line observed in the afternoon period.

   (b) it reduces conflict between pedestrians and through traffic activity at the existing bus stop.

   (c) it allows better utilisation of the footpath on the western side of Farrow Road for safe passage.

   (d) it provides a closer pedestrian link with the on-street accessible parking (8 spaces)

   (e) it utilises the carriageway space without the loss of parking spaces

   (f) the use of 2.5m kerb extensions enhances the sight distance for both pedestrians and oncoming traffic.

   (g) it reduces the length of crossing for pedestrians and generates increased crossing opportunities.

2. Reduction in bus zone lengths on both sides of Farrow Road catering for single bus operations. The northbound bus zone is proposed to be shortened from 43m to 30m and the southbound bus zone from 70m to 25m. The reduction in the length of the bus zone provides opportunity for the provision of a drop-off and pick up area.

3. Provision of 2.5m kerb returns to the existing pedestrian crossing to deter parking and improve sight line.

4. Extension of double barrier BB lines between the pedestrian crossings and the driveway to the western commuter car park.

5. Provision of new pick-up and drop-off zone (five spaces) adjacent to the relocated taxi zone utilising the available carriageway width.

6. Relocation of the existing taxi zone (two car spaces) closer to the train station adjacent to the proposed pedestrian crossing. This proposal is supported by the Taxi Council.

It is recommended that Council approve the concept plan for Farrow Road, Campbelltown, and continue with the design of the pedestrian crossing and associated amendments to the parking restrictions as described in the body of the report in accordance with Australian Standards and Roads and Maritime Services guidelines.

Officer's Recommendation

That Council endorse concept Plan 12795 for the provision of an additional pedestrian crossing and amendments to associated bus, taxi and drop-off/pick-up facilities in Farrow Road and proceed to detailed design and installation.

Discussion (11/2/2016)

The Manager Technical Services advised that following a number of concerns raised regarding pedestrian safety movements across Farrow Road as outlined in the report, it is suggested than an additional pedestrian crossing be installed.

The Manager Technical Services advised that the additional pedestrian crossing would encourage commuters to cross the road when leaving the railway station rather than crossing the road at multi locations between the station and the car park. A percentage of the commuters are also jaywalking instead of crossing the road at 90 degrees to the kerb.

The Roads and Maritime Services representative suggested that the installation of a second pedestrian crossing may not meet the RMS warrant criteria and requested that Council forward pedestrian counts and traffic volume data to RMS for consideration.

Recommendation of Local Traffic Committee

That Council forward pedestrian counts and traffic volume data to RMS for consideration in order to meet the warrant criteria for an additional pedestrian facility in Farrow Road, Campbelltown.

LTC 16/2	Plough Inn Road, Leumeah - additional accessible parking
Previous Report:	Nil
Electorate:	Campbelltown
Author Location:	Traffic and Road Design Unit

Attachments

Plan 12494 amendment sheet 1A, Plough Inn Road Leumeah.

Background (11/2/2016)

Council has received a number of requests from the community to increase the number of accessible parking spaces in the commuter car park located on the western side of Leumeah Rail Station.

At present there are 6 accessible parking spaces in the car park south of Plough Inn Road. These spaces are within 25m of the lifts giving access to the railway platforms. On a number of occasions Council staff has noted that all 6 accessible parking spaces have been occupied and all 244 spaces in the southern car park also occupied. At the same time there are usually up to 300 spaces still vacant at the far end of the northern car park, north side of Plough Inn Road.

In the case of non-availability of accessible parking closer to the station, people with accessibility issues have to park their cars in vacant spots of the northern car park and have to walk about 400m to the station.

Understanding the difficulties being faced by the people with accessibility issues, it is proposed to increase the number of existing accessibility parking spaces in the southern car park to 10 by converting 6 standard spaces (2.5m wide) to 4 additional accessible parking spaces (3.75m wide). A plan 12494 sheet 1A showing the layout of the additional accessible spaces, signs and markings is attached.

Officer's Recommendation

That Council increase the number of accessibility parking spaces from 6 to 10 spaces in the southern Plough Inn Road commuter car park as shown on Plan 12494 Sheet 1A.

Discussion (11/2/2016)

The Committee discussed the matter and supported the recommendation as presented.

Recommendation of Local Traffic Committee

That Council increase the number of accessibility parking spaces from 6 to 10 spaces in the southern Plough Inn Road commuter car park as shown on Plan 12494 Sheet 1A.

6. LATE ITEMS

No reports this round

7. GENERAL BUSINESS

LTC 16/3 Badgally Road - Road Widening Update

Previous Report: Nil

Electorate: Campbelltown

Author Location: Traffic and Road Design Unit

Attachments

Nil.

Discussion (11/2/2016)

The representative from the Campbelltown Chamber of Commerce advised that she had attended a meeting which had included representatives from the Roads and Maritime Services regarding the widening of Badgally Road, and enquired as to when it is anticipated this work will take place.

The Roads and Maritime Services representative advised that she was not aware of any programmed works by RMS.

The Manager Technical Services advised that Council had applied for grant funding through the Federal Government Western Sydney Infrastructure Program but had just been advised that the grant was unsuccessful.

Officer's Recommendation

That the information be noted.

LTC 16/4 Narellan Road - Lack of Line markings

Previous Report: Nil

Electorate: All Electorates

Author Location: Traffic and Road Design Unit

Attachments

Nil.

Discussion (11/2/2016)

The NSW Police representative advised that on Narellan Road at the off ramp to the freeway, the line markings are not visible.

The Manager Technical Services advised that this matter was discussed at the Council meeting last Tuesday along with signage.

The Manager Technical Services advised that he had met with the contractor and has been advised that the traffic lights at the hospital will be switched on in the next two days, also within the next two weeks the traffic lights at the intersection of Narellan Road and the M31 will be activated.

Officer's Recommendation

That the information be noted.

LTC 16/5 Anthony Drive, Rosemeadow - Speeding Vehicles

Previous Report: Nil

Electorate: Campbelltown

Author Location: Traffic and Road Design Unit

Attachments

Nil.

Discussion (11/2/2016)

The NSW Police representative advised that he had received a complaint from a resident regarding vehicles speeding in Anthony Drive, Rosemeadow and requested that Council consider installing a traffic counter.

The Manager Technical Services advised that a traffic counter had been installed in March 2015 and the Highway Patrol had also policed the area and had advised that some high speeds have been recorded but generally drivers are obeying the speed limit.

Officer's Recommendation

1. That the information be noted.

2. That the NSW Police representative advise the resident of the findings of the Highway Patrol.

LTC 16/6 Increased Traffic Volume - Raby Road and Thunderbolt Drive, Raby

Previous Report: Nil

Electorate: All Electorates

Author Location: Traffic and Road Design Unit

Attachments

Nil.

Discussion (11/2/2016)

The representative of the Local Member of Parliament raised concerns regarding the increased volume of traffic on Raby Road and Thunderbolt Drive, Raby in the mornings and afternoons.

The Manager Technical Services advised that at the moment the increase in traffic is probably as a result of the roadworks on Narellan Road.

The Committee were advised that Council has received funding for the next financial year and will undertake a detailed traffic assessment between Spitfire Drive and Campbelltown Road.

Officer's Recommendation

That the information be noted.

LTC 16/7	Delegation of Local Traffic Committee
Previous Report:	LTC 15/22
Electorate:	All Electorates
Author Location:	Traffic and Road Design Unit

Attachments

Nil.

Discussion (11/2/2016)

The Manager Technical Services advised that as previously discussed at the December 2015 meeting it is proposed that a report be prepared for the Traffic Committee meeting in March on the Agenda format for the 2016 meetings.

The Committee members agreed with the proposal and the Manager Technical Services advised the Agenda format guidelines will be discussed at the next meeting.

Officer's Recommendation

That the information be noted.

8. DEFERRED ITEMS

No reports this round

There being no further business the meeting closed at 9.15am.

P Lake
CHAIRPERSON

ATTACHMENT 2

CAMPBELLTOWN TRAFFIC COMMITTEE MINUTES

11 February 2016

CAMPBELLTOWN TRAFFIC COMMITTEE

Traffic related items to Council requiring technical advice and are outside of the Delegation functions issued to councils by the Road and Maritime Services.

Minutes Summary

ITEM TITLE

CAMPBELLTOWN TRAFFIC COMMITTEE MINUTES

1. ATTENDANCE

2. APOLOGIES

3. CONFIRMATION OF MINUTES
4. BUSINESS ARISING FROM MINUTES
5. REPORTS LISTED FOR CONSIDERATION

CTC 16/1 **Proposed Events for 2016 - TMP's for Community Events in 2016**

CTC 16/2 **School Zone Flashing Lights**

6. LATE ITEMS

CTC 16/3 **Rose Payten Drive, Minto - Removal of time restriction for Qube Logistics A-Double vehicles**

7. GENERAL BUSINESS

No reports this round

8. DEFERRED ITEMS

No reports this round

CAMPBELLTOWN TRAFFIC COMMITTEE MINUTES

Traffic related items to Council requiring technical advice and are outside of the Delegation functions issued to Councils by the Road and Maritime Services.

Minutes of the Campbelltown Traffic Committee held on 11 February 2016

1. ATTENDANCE

Campbelltown City Council
Councillor Paul Lake (Chairperson)
Manager Technical Services - Mr Kevin Lynch
Coordinator Traffic and Road Design - Mr Ajay Arora
Team Leader Traffic Investigation - Mr Frank Sirc
Administrative Assistant - Mrs Sue Lambert

Roads and Maritime Services
Ms Kaye Russell

Police Representatives
Senior Constable Maree Davies
Sergeant Marcus Cotton

Bus Companies
Interline - Mr Joe Oliveri
Busabout - Mr Stephen Burridge

Representatives of Local Members of Parliament
Mr Ray James

Representatives of Campbelltown Chamber of Commerce
Ms Anne Parnham

Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson Councillor Lake.

2. APOLOGIES

Nil at time of print.

3. CONFIRMATION OF MINUTES

The Minutes of the previous meeting held on 10 December 2015 were recommended by the City Works Committee on 9 February 2016 and adopted by Council on 16 February 2016.

4. BUSINESS ARISING FROM MINUTES

No reports this round

5. REPORTS LISTED FOR CONSIDERATION

CTC 16/1 **Proposed Events for 2016 - Traffic Management Plan's for Community Events in 2016**

Previous Report: CTC 15/2

Electorate: Campbelltown

Author Location: Traffic and Road Design Unit

Attachments

1. Traffic management plan for 2016 Ingleburn Alive Festival
2. Mahamakut Buddhist Foundation Songkran New Year Fete for 10 April 2016
3. ANZAC Day March for 25 April 2016
4. NAIDOC Week Street March 4 July parade route
5. Road closure plan for Chemical Cleanout July 2016
6. Road closure plan for Fisher's Ghost Festival 5 November to 13 November 2016
7. Traffic control plan for Hollylea Road Festival
8. Christmas Carols - Campbelltown Show Grounds, Campbelltown
9. Road closure plan for New Year's Eve celebration 31 December 2016

Background (11/2/2016)

The following community events are generally held on an annual basis which requires road occupancy for holding the event.

1. Ingleburn Alive Festival

Council in association with the representatives of Ingleburn Chamber of Commerce and the local community have been organising Ingleburn Alive Festival in Oxford Road, Ingleburn, for a number of years. Council proposes to hold the 2016 Ingleburn Alive Festival within the Ingleburn Central Business District on Saturday, 5 March 2016. The festival activities will commence at 10.00am and conclude by 9.30pm.

It is proposed to close the following roads between 6.00am and 12.00am to enable the festival to proceed:

- Oxford Road between Cumberland Road and Ingleburn Road.
- Carlisle Street between Boots Lane and Norfolk Street. Access to the parking areas will remain unaffected.
- Nardoo Street between Oxford Road and the Car park between Nardoo St and Norfolk Street. Access to the car park will remain unaffected.

- Macquarie Road between Oxford Road and Boots Lane. Access to Boots Lane will remain unaffected.

In accordance with the Special Event Guidelines and Roads and Maritime Services (RMS) event Matrix, the event is categorised as a Class 2 event which requires submission of a Special Event Traffic Management (SETMP) to RMS for endorsement (refer attachment 1).

The following traffic management measures are proposed at the road closure locations;

- road closure will be barricaded and managed by accredited traffic controllers
- intersections and/or access points in the vicinity of the barricades will be operational
- access for emergency vehicles will be maintained at selected locations
- access to public parking areas in the Ingleburn CBD will be available

In the case of an unforeseen emergency, the road closure will be suitably adjusted to meet the emergency requirements on advice from the New South Wales Police Force.

This is an alcohol free event and will be enforced by Council Rangers and the Police.

2. Mahamakut Buddhist Foundation Songkran New Year Fete, 39 Junction Road, Leumeah

The Buddhist Foundation has been organising this Fete annually within their grounds. Off street parking is provided in Leumeah High School and Biehler Reserve and traffic control is used to allow the pedestrians to cross Junction Road. The date for the 2016 event is 10 April 2016 from 9.00am to 4.30pm.

The event is classified as Class 2 and requires Council to submit a Special Event Transport Management Plan (SETMP) to Roads and Maritime Services (RMS) for endorsement. There is no change to the traffic management plan of the previous year. Updated SETMP for 2016 is attached (refer attachment 2).Full submission of the traffic management plan will be available at the meeting upon request.

3. ANZAC Day March - Queen Street, Campbelltown

The ANZAC Day parade will be held on Monday 25 April 2016 in Queen Street, Campbelltown. This is an annual event and is categorised as Class 2 requiring submission of a Special Event Traffic Management (SETMP) to the Roads and Maritime Services (RMS) for endorsement (refer attachment 3).

The parade involves the following temporary road closures which are in line with last year's event:

a. Closures between 8.00am and 9.00am

- Queen Street - between Town Hall Theatre and the southern alignment of Cordeaux Street.
- Allman Street - between Queen Street and the Allman Street car park (known as Carberry Lane).

b. Closures between 8.00am and 9.00am

- Queen Street between Cordeaux and Broughton Street Westbound traffic in Cordeaux Street will be turned around at the Carberry Lane roundabout or redirected south down Carberry Lane.

Road closures are proposed at the following intersections:

- Cordeaux Street- West of Carberry Lane
- Railway Street- East of Short Street
- Queen Street- South of Broughton Street
- Howe Street- South of Broughton Street

Bus companies will be required to reroute their services in the same way as was done in the previous years.

4. NAIDOC Week Street March

Campbelltown City Council with the assistance of NSW Police manages a mobile pedestrian march along Queen Street every year for National Aboriginal and Torres Strait Islanders Day observance Committee (NAIDOC). This year the celebration week will commence from 3 July 2016 to 10 July 2016 and the pedestrian march will be held on Monday, 4 July 2016. The march is a celebration of Aboriginal and Torres Strait Island cultural heritage, identity and survival and is an integral part of the National NAIDOC Week celebrations.

The details of NAIDOC march are as follows:

- approximately 100 to 200 people will be involved.
- the march will commence approximately at 10.30am on Monday 4 July, departing from Campbelltown City Council`s Civic Centre and will conclude at Bradbury Park approximately at 11.00am.
- there will be several vehicles utilised to ensure Aboriginal Elders are able to participate in the march.

In 2015 the destination of the march changed from Koshigaya Park to Bradbury Park with the parade turning left at the end of Queen Street into Camden Road and proceeding across Moore Oxley Bypass by the underpass (refer attachment 4). To ensure a successful start to the NAIDOC 2016 Week celebrations, the NSW Police and Council will assist with traffic control during the march.

In accordance with Special Event Guidelines, Council has determined that the event is a Class 4 event as it falls under the control of the Police. Council will assist the Police by providing traffic control resources where required. Side streets are closed by the Police to continue the progress of the parade. The Police will control road closures as the parade proceeds with the lead escort vehicle providing point duty at critical intersections.

It is required to close Queen Street, from Browne Street to Camden Road, between 10.15am to 11.00am to facilitate the pedestrian march. No other vehicular floats are allowed in the march other than the vehicles used to transport the Elders.

This section of Queen Street will be reopened as the parade progresses down Queen Street.

5. Chemical Cleanout - Junction Road, Ruse

Council in association with the Office of Environment and Heritage (OEH) has been organising this event at the Council's Effluent Disposal Facility (EDF) in Junction Road, Leumeah for a number of years. Event is taking place in July 2016 from 9.00am to 3.30pm, actual dates to be advised (TBA).

Council undertakes traffic management during the event and normal traffic is restored at the end of each day. The event is classified as Class 2. This requires Council to submit SETMP to RMS for endorsement. There is no change to the traffic management plan of the previous year. Updated SETMP for 2016 is attached (refer attachment 5).

6. Fisher's Ghost Festival - Campbelltown

This is an iconic event of the Campbelltown LGA which has been happening for more than 50 years. The one week 2016 event will commence on 4 November and conclude on 13 November. During this period a number of events will take place at different venues. The following three events require road closures as two are on-road events and the third is to provide safe access and exit from the off-street venue.

Street Parade: 5 November 2016
Street Fair: 12 November 2016
Carnival: 4 November to 6 November and 11 to 13 November 2016

This is a Class 2 event which requires submission of SETMP to the RMS for endorsement.

Street Parade - Queen Street, Campbelltown

Street Parade commences from Broughton Street and travel southward in Queen Street to terminate in Camden Road. This event is scheduled for Saturday 5 November 2016 and will commence at 1.00pm to conclude by 4.30pm. Proposed road closure, traffic management and time of operation will be in line with the 2015 event. Roads affected by closures are indicated in attachment 6a.

Council will be seeking NSW Police assistance for traffic management at the Hurley Street and Camden Road intersection same as it was in previous years.

Street Fair - Queen Street, Campbelltown

Activities of the Street Fair will be around Mawson Park precinct. Cultural events will be held in the park and stalls will be located on the adjoining streets. The 2016 event is scheduled for Saturday 12 November 2016. The activities will commence at 7.00am and conclude by 4.00pm. Roads affected by the closures are indicated in attachment 6b. No changes are proposed to the previous year's traffic management plan for the 2015 event.

Carnival - Bradbury Oval, Bradbury

This is an off-street event which includes Fisher's Gig, rides, live entertainment and fireworks. The event will happen on both weekends. The event timings are:

Saturday 2.00pm to 11.00pm
Sunday 2.00pm to 9.30pm

Access to Bradbury Oval will be via The Parkway. There will be some traffic management in Bland Street as additional exit from the Oval will be provided through this street. Traffic Management measures restrict on-street parking (refer attachment 6c).

In addition, temporary 'No Stopping' restrictions will be provided at the Lawn Avenue and The Parkway intersection. Additional accessible parking will be provided in Bradbury Oval.

To enforce parking restrictions, assistance from Council Rangers and NSW Police will be required as in previous years.

7. Hollylea Road Festival

Hollylea Road Festival is a charity event organised every year by Fight Against Cancer Macarthur Inc. on a section of Hollylea Road south of Plough Inn Road, Leumeah. The following dates and times apply:

Event Date:	Sunday, 13 November 2015 (tentative)
Event Time:	7.00am to 3.00pm
Road Closed:	6.00am to 4.00pm
Affected Section:	Property 10 to the end of cul-de-sac.

The event will showcase vintage and modified cars, motorbikes and four wheel drive vehicles in support of the 24hr-Fight Against Cancer Macarthur Inc.

The proposed road closure is categorised as a **Class 3** event in accordance with the RMS event matrix. The event is being organised in a commercial cul-de-sac street and most of the businesses are closed on Sundays. Only two businesses located at the end of the cul-de-sac open and for which an alternative route is available through a back access way located adjacent to Campbelltown Road. The proposed traffic management measures, closed road sections and businesses not operating on Sunday's are indicated in the attached sketch, Attachment 7.

This event was first organised in 2010 and no adverse comments have been received. Council will require the organisers to discuss with the NSW Police Force regarding their independent approval for the event.

The event organisers will carry out the following:

- advise all businesses in Hollylea Road, south of Plough Inn Road.
- ensure that the event patrons do not park in the parking areas of operating businesses.
- advance road closure signs be installed along Hollylea Road, south of Plough Inn Road.
- notify Emergency Services and maintain clear access at all times for emergency vehicles.
- advertise traffic management measures on their website.

8. Christmas Carols - Campbelltown Sports Stadium, Campbelltown

Council proposes its annual Christmas Carols event on 3 December 2016 at the Campbelltown Sports Stadium.

The proposed event is categorised as Class 3 as the event does not impact on local or major traffic and transport systems or disrupt non-event community in the immediate vicinity. A SETMP for this event is not required to be submitted to the RMS.

9. New Year's Eve Celebrations - Koshigaya Park, Campbelltown

The 2016 New Year's Eve celebrations will be held on Saturday 31 December 2016 in Koshigaya Park, Campbelltown. This is an annual event and is categorised as Class 2 requiring submission of SETMP to the RMS for endorsement, refer attachment 8.

The event involves following road closures which is similar to the last year's event:

- Camden Road - from the roundabout at the Catholic Club up to Hurley Street.
- Hurley Street - from Camden Road to the Campbelltown Mall roundabout
- Kellicar Road- from Camden Road to Narellan Road

The road closures are planned to commence from 6.00pm and continue until 12.30am. The event is proposed to commence at 7.00pm with the fireworks at 9.00pm and midnight.

Officer's Recommendation

1. That Council approve the traffic management plans for the following events:

• Ingleburn Alive Festival	5 March 2016
• Songkran New year Fete	10 April 2016
• ANZAC Day March	25 April 2016
• NAIDOC Week Street March	3 -10 July 2016
• Chemical Cleanout	July 2016 - dates TBA
• Fisher's Ghost Festival	4 – 13 November 2016
• Hollylea Road Festival	13 November 2016
• Christmas Carols	3 December 2016
• New Year's Eve Celebrations	31 December 2016

2. That Council undertakes temporary road closures on affected streets as required for these events.

3. That Council provides on-street advance notice signs of the road closures at least one week prior to the event and liaise with various stakeholders.

4. Council advertise road closure 28 days prior to the event on its website and in local Newspapers.

5. That Council prepare and submit Special Event Traffic Management Plan for the events mentioned within the body of the report to RMS for endorsement.

Discussion (11/2/2016)

The Committee discussed the matter and supported the recommendation as presented.

Recommendation of Campbelltown Traffic Committee

1. That Council approve the traffic management plans for the following events:

• Ingleburn Alive Festival	5 March 2016
• Songkran New year Fete	10 April 2016
• ANZAC Day March	25 April 2016
• NAIDOC Week Street March	3 -10 July 2016
• Chemical Cleanout	July 2016 - dates TBA
• Fisher's Ghost Festival	4 – 13 November 2016
• Hollylea Road Festival	13 November 2016
• Christmas Carols	3 December 2016
• New Year's Eve Celebrations	31 December 2016

2. That Council undertakes temporary road closures on affected streets as required for these events.

3. That Council provides on-street advance notice signs of the road closures at least one week prior to the event and liaise with various stakeholders.

4. Council advertise road closure 28 days prior to the event on its website and in local Newspapers.

5. That Council prepare and submit Special Event Traffic Management Plan for the events mentioned within the body of the report to RMS for endorsement.

CTC 16/2 School Zone Flashing Lights

Previous Report: CTC 13/37, 15/16

Electorate: All Electorates

Author Location: Traffic and Road Design Unit

Attachments

Roads and Maritime Services letter to Council

Background (11/2/2016)

Following the State Government announcement in February 2015 to provide a $5m commitment for a second set of flashing lights outside at least 400 schools in NSW, the Roads and Maritime Services (RMS) has advised Council that the program is expected to commence in early 2016. These works are to be completed by December 2017.

The schools which have multiple entrances and have only one set of flashing lights are eligible for a second set of flashing lights.

A second set of flashing lights is intended to cover the second busiest entrance point in the school zone. RMS will contact all schools to submit their nominations which will be assessed and prioritised into an implementation schedule. Once the schedule is finalised, Council and schools will be advised on the location and timeframe of the second set of flashing lights.

Officer's Recommendation

That the information be noted.

Discussion (11/2/2016)

The Committee discussed the matter and supported the recommendation as presented.

Recommendation of Campbelltown Traffic Committee

That the information be noted.

6. LATE ITEMS

CTC 16/3 **Rose Payten Drive, Minto - Removal of time restriction for Qube Logistics A-Double vehicles**

Previous Report:	CTC 15/6 and 15/12
Electorate:	Macquarie Fields
Author Location:	Traffic and Road Design Unit

Attachments

Extract NHVR Journey ID route Qube Logistics

Background (11/2/2016)

Council has received a request on 28 January 2016 from Qube Logistics through the National Heavy Vehicle Regulator (NHVR) for the removal of an existing time restriction on the movement of A-Double vehicles for the period from 28 January 2016 to 23 June 2016 as a trial.

Council at its meeting of 9 June 2015 adopted the Traffic Committee's recommendation to approve the movement of A-Double vehicles on Stonny Batter Road and Rose Payten Drive subject to the following conditions;

1. That A-Double vehicles travel between the times of 7.00pm-6.00am and 10.00am-3.00pm
2. That the PBS (Performance Based Standards) permit for the A-Doubles be reviewed after the period ending 5 August 2017 (as per the application via NHVR)
3. Each A-Double must not exceed a gross vehicle mass of 62.5 tonne and a length of 30 metres.
4. That Council reserves the right to withdraw its approval subject to any adverse safety impact on local community and road network.

Qube Logistics currently has a Heavy Vehicle PBS Authorisation Permit to run A-Doubles between Minto and Eastern Creek/Erskine Park. The permit is valid for 6 nominated prime movers in the fleet.

Council has since sought advice from the Roads and Maritime Services who confirmed that road freight movements for container transport for the South Western Motorway (M5) has curfew restrictions for Eastbound movements between 6.00am to 10.00am and Westbound movements 3.00pm to 7.00pm, which are set by Transport for NSW Freight and Ports Strategy. These restrictions are placed due to road congestion along the M5 and peak hour traffic surrounding southern Sydney. These freight curfew hours are currently being reviewed by Transport for NSW.

Since Council's approval in June 2015 Council staff has not received any concerns from the community regarding the movement of A-Double vehicles through its area.

Although Council has not received any information about the lifting of curfew hours on the State Road network it is recommended that the Committee discuss the possible removal of the time restriction. The application also needs to be considered by RMS being the Road Manager for state road network.

Officer's Recommendation

Item for discussion.

Discussion (11/2/2016)

The Manager Technical Services advised that following Council's approval in June 2015 to the movement of A-Double vehicles on Stonny Batter Road and Rose Payten Drive, a further request has been received from Qube Logistics through the National Heavy Vehicle Regulator for a period of six months from 28 January 2016 to 23 June 2016 for the removal of the existing time restrictions.

The Manager Technical Services advised that Council had received no concerns from the community regarding the movement of A-Double vehicles.

The Traffic Committee representatives advised that they had no concerns regarding the removal of the existing time restrictions, however information would need to be forwarded to RMS for their consideration.

Recommendation of Campbelltown Traffic Committee

1. That Council approves the removal of the existing time restrictions for a trial period of six months subject to recommendation 2 below.

2. That Council advise the applicant that approval is firstly required by Roads and Maritime Services as the Road Manager for state road network.

7. GENERAL BUSINESS

No reports this round

8. DEFERRED ITEMS

No reports this round

There being no further business the meeting closed at 9.40am.

P Lake
CHAIRPERSON

2. OPERATIONAL SERVICES

No reports this round

3. ASSETS AND SUPPLY SERVICES

No reports this round

4. EMERGENCY SERVICES

No reports this round

5. GENERAL BUSINESS

Nil.

22. CONFIDENTIAL ITEMS

No reports this round

There being no further business the meeting closed at 7.37pm.

S Dobson
CHAIRPERSON

Reports of the Community Services Committee Meeting held at 5.30pm on Tuesday, 15 March 2016.

APOLOGIES

ACKNOWLEDGEMENT OF LAND

DECLARATIONS OF INTEREST

Pecuniary Interests

Non Pecuniary – Significant Interests

Non Pecuniary – Less than Significant Interests

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Minutes of the Community Services Committee held on 15 March 2016

Present

Councillor T Rowell (Chairperson)
Councillor G Brticevic
Councillor W Glynn
Councillor D Lound
Councillor M Oates
Councillor R Thompson
Acting Director Community Services - Mrs J Uluibau
Director Strategy - Mr J Lawrence
Manager Communications and Marketing - Mrs B Naylor
Manager Community Resources and Development - Mr B McCausland
Acting Manager Customer Service - Ms M James
Acting Manager Education and Care Services - Ms G Vickers
Manager Healthy Lifestyles - Mr M Berriman
Manager Library Services - Mr G White
Manager Technical Services - Mr K Lynch
Policy and Governance Coordinator - Ms J Warner
Executive Assistant - Mrs D Taylor

Apology **(Rowell/Lound)**

That the apology from Councillor Matheson be received and accepted.

CARRIED

Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson Councillor Rowell.

DECLARATIONS OF INTEREST

There were no Declarations of Interest at this meeting.

1. COMMUNICATIONS AND MARKETING

No reports this round

2. COMMUNITY RESOURCES AND DEVELOPMENT

2.1 Indent Event Development Grants Funding

Reporting Officer

Manager Community Resources and Development

Attachments

Nil

Purpose

To seek Council's endorsement of a funding application for $5,000 to MusicNSW for the Indent Event Development Grants Funding to support Fisher's Gig 2016 as part of Council's All Ages Entertainment Program.

History

Indent is a project of MusicNSW that plays an important role in the development of all-ages entertainment and provides development support for youth entertainment across the state.

Indent works directly with young people to empower them and help raise awareness of their needs, opportunities and training connecting them with support organisations in their community. Participants gain valuable experience and are involved in a range of tasks such as booking venues, liaising with police, managing security, organising public liability insurance, advertising and promotion.

Report

Indent Event Development grants are awarded to teams of young people (12-25 years) in NSW to stage their own drug and alcohol free events. Information, resources, advice and support are provided to enable young people to be active in their local music scene and create sustainable youth events.

This year funding is provided through two categories. The Grassroots Grants set at $2,500 are for entry level, small scale local events. The Event Development Grants, which Council proposes to apply under, set at $5,000 and are geared at the larger scale events such as Fisher's Gig.

Officer's Recommendation

1. That Council endorse the funding application for $5,000 to MusicNSW to be used towards Fisher's Gig 2016 and Council's All Ages Entertainment Program.

2. That subject to notification of success, the Funding Agreement from MusicNSW be accepted and signed by the General Manager or delegate on behalf of Council.

Committee's Recommendation: **(Thompson/Lound)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Rowell/Thompson)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 33

That the Officer's Recommendation be adopted.

2.2 2016 Youth Week

Reporting Officer

Manager Community Resources and Development

Attachments

Nil

Purpose

To inform Council of planned 2016 Youth Week activities to be held from 8 - 28 April across the Campbelltown Local Government Area (LGA).

History

National Youth Week is a joint Federal, State, Territory and Local Government initiative and is the largest celebration of young people in Australia. Each year large numbers of young people aged 12-25 years get involved in National Youth Week. National Youth Week is an opportunity for young people to share ideas, attend live events, and have their voices heard on issues that concern them, showcase their talents, celebrate their contribution to the community, take part in competitions and have fun.

Report

The theme for this year's National Youth Week is 'It Starts With Us'. Council staff are currently finalising a comprehensive program of events with the assistance of local young people and youth services.

To help local communities celebrate National Youth Week 2016, Council, with the support of the NSW Government, has provided financial support and assistance for youth services, community groups and organisations to undertake Youth Week projects, events and activities.

Council also offered partnership funding of up to $500 per project to local youth groups and service providers to host a Youth Week event. Applicants needed to demonstrate that they could provide dollar for dollar funding or in-kind support to the same value. Expressions of Interest (EOI) closed on Friday 11 December 2015, with a total of eight EOI applications received by Council.

The following projects are the final 2016 Youth Week projects receiving funding:

Multicultural Forum - Bridging the Gap

Council will partner with Afghan Fajar and multicultural service providers from the Campbelltown LGA to host a Multicultural Forum on 16 April from 10.30am to 1.30pm to provide young people with the opportunity to talk openly about their culture and develop a range of life skills including leadership, communication and teamwork.

Health and Wellbeing Initiatives

Council will partner with Thomas Reddall High School's SRC to plan and implement a Dream Big project on Wednesday 6 April from 8.30am to 3.00pm. Throughout the project, participants will use a journal to record their life journey by reflecting on their dreams and aspirations accompanied by a vision board to demonstrate their goals, dreams and career aspirations.

Diversity and Equality Initiatives

Council will partner with Ambarvale High School to host a series of workshops on 8 April from 8.30am to 2.50pm exploring diversity and equality, health and wellbeing, participation and engagement through live performances, information stalls, community involvement and a sausage sizzle.

Outreach Youth Sport and Fitness

Council will partner with PCYC Campbelltown to deliver five Outreach Sport and Fitness sessions across the Campbelltown Local Government Area. PCYC will provide staff to deliver the fitness sessions, giveaways and free memberships to participants.

Skate, Scoot and BMX Showcase

Council will partner with Totem Skate School and local youth services on Saturday 16 April from 3.30pm to 5.30pm to encourage young people to participate in a free jam session at St Helens Park Skate Park. On the day there will be a showcase of skate, scooter and BMX demonstrations by sponsored riders. The day also includes a free BBQ, music and giveaways.

Launch of 30 Things to Do in Macarthur for Young People

Macarthur Youth Services Network will launch a regional resource of 30 Things for Young People to do in Macarthur for under $15 on 8 April.

Campbelltown, Camden and Wollondilly Council Youth volunteer teams are working in partnership to plan a regional Amazing Race activity to launch the resource on Friday 8 April from 9.00am to 3.30pm

The resource will provide an outline of affordable related activities for young people across Campbelltown, Camden and Wollondilly LGAs.

The Amazing Race will see teams of young people from across the three LGAs visit a number of locations found in the resource educating them about them about the types of activities and opportunities that are available to them in their local area.

All Ages Gig

Council will work with high schools, youth services and young people to host a Youth Week All Ages Show at Eagle Vale High School.

Youth Volunteers from Campbelltown Youth Entertainment Reference Group will mentor and support young people from Claymore Youth Advisory Group and Eagle Vale High School Entertainment students to plan and organise the All Ages Gig.

All events will be promoted across the Campbelltown LGA on the National Youth Week Website, social media and Council's National Youth Week calendar of events, which will be distributed through the High Schools and Youth Networks.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: (Oates/Glynn)

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 (Rowell/Thompson)

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 33

That the Officer's Recommendation be adopted.

2.3 Seniors Week 2016

Reporting Officer

Manager Community Resources and Development

Attachments

Nil

Purpose

To provide Council with information on the 2016 Seniors Week celebrations to be held from 1 - 10 April across the Campbelltown Local Government Area (LGA).

Report

Seniors Week is an annual state wide community event that celebrates the valuable contribution seniors make to our community.

This year's state wide Seniors Week theme 'Grow Young' celebrates our seniors for their energy and unique ability to know who they are together with a focus on health and well-being. Council in partnership with local community organisations, clubs and businesses, will coordinate a diverse range of activities that encourage the active involvement of older residents within the Campbelltown community to participate in accessible and affordable local events.

Council will once again coordinate two Seniors Concerts at clubs across the Campbelltown LGA. A concert for people with dementia and their carers will be held at Western Suburbs Leagues Club on Tuesday 30 March and the other for general admission and frail aged groups, to be held at the Campbelltown RSL Club on Wednesday 6 April.

HJ Daley Library in partnership with Macarthur Legal Centre will be hosting an information session for seniors discussing wills, financial management and guardianship on Tuesday 5 April, from 2.00pm to 3.30pm.

Council will also offer free passes for all local seniors to Council's Leisure Centres across Seniors Week.

The Campbelltown Arts Centre Seniors Week program will include a Seniors Dance on Sunday 3 April, Seniors Soiree Sunday 10 April, Exhibition Talk for Seniors Tuesday 12 April and Art and Memory Tours throughout April.

On Friday 8 April, Council will hold an Engaging Seniors Forum at the Civic Hall to inform seniors on the use of the new My Aged Care System and interactive workshops on a variety of activities seniors can take part in to assist in their wellbeing.

A Seniors Week Calendar of Events has been developed, which details events and activities for local seniors across the month of April with 2,500 copies distributed throughout the local community.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: (Glynn/Thompson)

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 (Rowell/Thompson)

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 33

That the Officer's Recommendation be adopted.

3. CULTURAL SERVICES

3.1 Catalyst - Australian Arts and Culture Fund through the Australian Government Department of Communications and the Arts

Reporting Officer

Manager Cultural Services

Attachments

Nil

Purpose

To seek Council's endorsement of a submission to the Australian Government Department of Communications and the Arts for the Catalyst Grant for the following projects; 'The Last Picture Show' for $50,000, 'David Griggs Survey' for $100,000, 'One the Bear' for $20,000 and 'Eko Suprinyanto with Ahil Ratnamohan' for $20,000.

History

'Catalyst' is the Australian Government's new funding program for the arts which will provide $12m each year in innovative projects and initiatives from arts and cultural organisations. 'Catalyst' will assist organisations to forge new creative and financial partnerships and stimulate innovative ways to build participation by Australians in our cultural life. It will enable access to high quality arts experiences in regional communities and international activities that achieve cultural diplomacy objectives. Projects by, or that involve, small to medium organisations will be given priority. The fund may also support some gallery, library, archive, museum, arts education and infrastructure projects.

Report

Campbelltown Arts Centre has a selection of upcoming projects proposed in 2016 and 2017 across the artistic program.

As part of the visual arts program, 'The Last Picture Show' 2016 and 'David Griggs Survey' 2017 present major retrospective exhibitions from two Australian established artists whose practice is informed by the society we live in.

'The Last Picture Show' includes works by Mike Parr. Parr predominantly works in performance and video and has pioneered both practices within an Australian and international context. The exhibition will include an immersive major commission artwork that will take the form of a maze within the gallery space. 'The Last Picture Show' will officially launch on 26 August 2016 from 6.00pm, with exhibition dates 13 August - 16 October 2016.

'David Griggs Survey' will include a suite of paintings by Griggs and premiere a major feature film. This grant will directly fund the exhibition costs, a publication and education and public programs. Following the exhibition, Museum & Galleries NSW will orchestrate a long-term tour throughout 2018 and 2019 of the exhibition to venues in regional NSW, Queensland and Victoria. 'David Griggs Survey' will officially launch on Friday 24 March 2017 from 6.00pm, with exhibition dates 25 March - 28 May 2017.

As part of the performance program, 'One the Bear' is a hip hop theatre piece for high school aged young people written and performed by Candy Bowers. Bowers is a passionate writer/performer and has worked for theatre companies and festivals across the country. 'One the Bear' will have a strong socially engaged aspect; Bowers will work directly with local high schools to develop the project. Stage one development dates are 18 - 31 July 2016 and Stage 2 development dates are 10 October - 6 November 2016.

As part of the dance program, Eko Suprinyanto, based in Indonesia and Ahil Ratnamohan, based in Sydney will together create a new work with young males in Campbelltown. Eko Suprinyanto is the founder and artistic director for Solo Dance Studio in Surakarta Indonesia since 1996 and has an established dance practice. Ahil Ratnamohan is a theatre-maker creating physical performance inspired by sport, film, language and unorthodox forms. This project will have a strong socially-led approach whereby a series of workshops will be presented to schools by the artists and the outcome of these engagements will be transformed into a dance performance to be presented in 2017.

Officer's Recommendation

1. That Council endorse the submission to the Australian Government Department of Communications and the Arts requesting $190,000 funding support for the delivery of the projects - 'The Last Picture Show' for $50,000, 'David Griggs Survey' for $100,000, 'One the Bear' for $20,000 and 'Eko Suprinyanto with Ahil Ratnamohan' for $20,000.

2. That subject to notification of success, the funding agreement from the Australian Government Department of Communications and the Arts be accepted and signed by the General Manager on behalf of Council.

Committee's Recommendation: **(Thompson/Lound)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Rowell/Thompson)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 33

That the Officer's Recommendation be adopted.

4. CUSTOMER SERVICE

No reports this round

5. EDUCATION AND CARE SERVICES

No reports this round

6. HEALTHY LIFESTYLES

No reports this round

7. LIBRARY SERVICES

No reports this round

8. GENERAL BUSINESS

Nil.

23. CONFIDENTIAL ITEMS

No reports this round

There being no further business the meeting closed at 5.38pm.

T Rowell
CHAIRPERSON

Reports of the Corporate Governance Committee Meeting held at 5.30pm on Tuesday, 15 March 2016.

APOLOGIES

ACKNOWLEDGEMENT OF LAND

DECLARATIONS OF INTEREST

Pecuniary Interests

Non Pecuniary – Significant Interests

Non Pecuniary – Less than Significant Interests

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Minutes of the Corporate Governance Committee held on 15 March 2016

Present

His Worship the Mayor, Councillor P Hawker
Councillor C Mead (Chairperson)
Councillor F Borg
Councillor S Dobson
Councillor G Greiss
Councillor R Kolkman
Councillor P Lake
General Manager – Ms L Deitz
Director Business Services - Mr M Sewell
Director City Works - Mr W Rylands
Manager Emergency Management and Facility Services - Mr R Blair
Manager Executive Services - Mr N Smolonogov
Manager Financial Services - Mrs C Mears
Manager Governance and Risk - Mrs M Dunlop
Manager Human Resources - Mr B Clarence
Manager Information Management and Technology - Mrs S Peroumal
Manager Operational Services - Mr A Davies
Manager Property Services - Mr J Milicic
Executive Assistant - Mrs K Peters

Apology

(Mead/Kolkman)

That the apology from Councillor Chanthivong be received and accepted.

CARRIED

Acknowledgement of Land

An Acknowledgement of Land was presented by the Chairperson Councillor Mead.

DECLARATIONS OF INTEREST

Declarations of Interest were made in respect of the following items:

Pecuniary Interests - nil

Non Pecuniary – Significant Interests

Councillor Kolkman - Confidential Item 24.1 - Licence Agreement for Campbelltown Camden District Band Incorporated - Councillor Kolkman advised that he is a patron member of the Campbelltown Camden District Band Incorporated and that he will leave the room and not take part in debate nor vote on the matter.

Non Pecuniary – Less than Significant Interests - nil

Other Disclosures - nil

1. GOVERNANCE AND RISK

1.1 Towards New Local Government Legislation - Proposed Phase One Amendments to the *Local Government Act 1993*

Reporting Officer

Manager Governance and Risk

Attachments

1. Towards New Local Government Legislation Explanatory Paper: proposed Phase 1 amendments (contained within this report)
2. Campbelltown City Council assessment of the proposed Phase 1 amendments to the *Local Government Act 1993* (contained within this report)

Purpose

This report provides an update on the NSW Government's Local Government reform program.

Report

Towards New Local Government Legislation is a NSW local government reform initiative to remake the *Local Government Act 1993* with a number of significant changes. It follows on from work completed in recent years by the Independent Local Government Review Panel and the Local Government Acts Task Force. It has also been influenced by broader industry discussions and other current local government review and reform initiatives. All of these initiatives are now being collectively considered as part of the Fit for the Future program of local government reform.

The introduction of more streamlined legislation has been phased. The Phase 1 amendments to the *Local Government Act 1993* were recently published with the proposed changes focused on civic governance and strategic planning processes of councils. It is currently anticipated that amending legislation could be introduced into and passed by NSW Parliament in 2016.

In particular, the Phase 1 amendments aim to:

- clarify roles and responsibilities of councillors, mayors, administrators and general managers
- introduce new guiding principles for local government
- improve governance of councils and professional development for councillors
- expand on the framework for strategic business planning and reporting
- prioritise community engagement and financial accountability
- streamline council administrative processes

Attached to this report contains details of 37 sets of change proposals grouped under eight themes that appeared in the explanatory paper issued by the NSW Office of Local Government.

The eight themes covered in the Phase 1 amendment proposals are:

1. Guiding principles for the Act and local government
2. Structural framework of local government
3. The governing body of councils
4. Elections
5. Council's workforce
6. Ethical standards
7. Council's strategic framework
8. Council performance

The nature of the proposals varies considerably. Some proposals set out prescriptive changes to legislative clauses while others are expressed more as statements of principle and intent.

Each proposal serves one or more of the following purposes:

- eliminate redundant or superfluous content
- make certain matters the subject of subordinate legislation (via Regulation)
- clarify existing provisions
- address a perceived policy gap
- signal a change in policy direction

The Office of Local Government has chosen to adopt a survey approach for this stage of consultation. Respondents only have the option of completing an online web form choosing from "Yes - support", "No - do not support" or "Neutral" options. There is provision for the addition of comments below each response. This means that a consolidated submission cannot be made as a single document and there is no provision for adding any sort of covering letter. Attachment 2 to this report has been prepared with these constraints in mind.

A webinar briefing on the proposed Phase 1 amendments was held on 8 March 2016, and responses are due on Tuesday 15 March 2016. Due to the timing of the webinar briefing and deadline for submissions, Council officers propose to submit the responses contained in attachment 2 and are seeking Council's endorsement.

Officers reviewing the proposals support the vast majority of proposals and assess them as having merit. However, it is difficult to make a fully informed assessment on some of the proposals until Parliamentary Counsel drafts a Bill to reflect the policy positions.

A point of disagreement has been flagged for 8.1 - Annual Reports, where it is proposed to require the information reported in Council's annual reports to be endorsed as factually accurate by an internal audit committee. Council's will be required (8.4) to establish internal audit committee with a majority of independent members and an independent Chair.

The annual reports include information about the status of Delivery Program and Operational Plan actions and, as such, the proposal fundamentally broadens the role and responsibilities of internal audit committees. It is questionable whether this is reasonably within the remit of

Council's internal audit committee or practicably possible for the Committee to undertake. The details of this proposed amendment should be subjected to closer scrutiny in line with recommendations emerging from the current IPART *Review of reporting and compliance burdens on Local Government.*

Further phases of amendments have been foreshadowed with advice that future amendments will focus on the way in which councils raise revenue and exercise their regulatory functions and will address recommendations arising from reviews being undertaken by the IPART about the regulatory burden imposed on councils and the revenue-raising powers of councils.

Officer's Recommendation

That Council endorse the responses to the "New Local Government Act Development Consultation – Phase 1" under the Fit for the Future local government reform program.

Committee's Recommendation: **(Hawker/Lake)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Mead/Lake)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

That the Officer's Recommendation be adopted.

Councillors Dobson, Mead and Thompson asked for their names to be recorded in opposition to the resolution for Item 1.1 – Towards New Local Government Legislation - Proposed Phase One Amendments to the *Local Government Act 1993*.

ATTACHMENT 1

Fit for the Future

Towards New Local Government Legislation
Explanatory Paper: proposed Phase 1 amendments

NSW GOVERNMENT Office of Local Government

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

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Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

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Fit for the Future

Foreword

The journey towards stronger, more sustainable local government began in late 2011. Councils from throughout NSW came together for Destination 2036 to discuss their long-term future. The gathering considered how communities, economies and technologies might change over the next 25 years and how the local government sector might change to meet these challenges. This led to the appointment of the *Independent Local Government Review Panel* (the Panel) and *Local Government Acts Taskforce* (the Taskforce).

While the fundamentals of the *Local Government Act 1993* remain sound, both the Panel and the Taskforce recommended change. The Government's response to the Taskforce and Panel reports was released in 2014 and supported many important recommendations that had been made for legislative reform – including the development of modern, principles-based local government legislation.

The proposed phase 1 reforms are the first step in the process of modernising the Local Government Act, to ensure that it meets the future needs of councils and communities. Phase 1 of the reform program focuses mainly on changes to the governance and strategic business planning processes of councils. Later phases will focus on how councils raise revenue and how they exercise their regulatory functions, as well as a program of restructuring and updating the local government legislation.

I would like to invite councils and communities to provide your input and co-operation on this critical phase of the Fit for the Future reforms and I look forward to working with you as we continue the process of reform.

Paul Toole

The Hon. Paul Toole
Minister for Local Government

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

Overview

We are seeking your feedback

The Office of Local Government is seeking input on important proposals by the NSW Government for legislative reform. The views of councils and their communities, and other stakeholders, are now being sought on phase 1 of the development of new Local Government legislation.

Phase 1 is designed to:

- embed strategic business planning principles across the range of council functions and practices;
- promote independent and sustainable councils engaged with and accountable to their local communities that have the capacity to deliver on local and regional needs; and
- support a culture of continuous improvement in councils to ensure the effective and efficient delivery of the strategic goals agreed to with their local communities.

How to give your feedback

Each of the amendments that is being proposed for phase 1 is described briefly in this explanatory paper and a cross-reference to any relevant recommendation of the Panel and/or the Taskforce is given. Most of these proposals have been the subject of stakeholder consultation in developing the Government's response to the Panel and Taskforce reports, so the paper is as streamlined as possible. The aim of this consultation is to use feedback received about the phase 1 amendments to inform the legislative drafting process.

The first stage of consultation is therefore an invitation to provide your feedback on each of these proposals through an online survey on the Fit for the Future website at www.fitforthefuture.nsw.gov.au. There will also be a link through the NSW Government's Have Your Say website at www.haveyoursay.nsw.gov.au.

Following consultation, it is anticipated that amending legislation could be introduced into and passed by the NSW Parliament in 2016.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

1. Guiding principles for the Act and local government

1.1 Purposes of the Local Government Act

Proposed Amendment
The purposes of the *Local Government Act 1993* should be:

- to establish a legal framework for the NSW system of local government, in accordance with section 51 of the *Constitution Act 1902* (NSW);
- to describe the nature and extent of the responsibilities and powers of local government; and
- to create a system of local government that is democratically elected, engages with and is accountable to the community, is sustainable, flexible, effective and maximises value for money.

Current provision:
Section 7

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.1.1 Purposes of the Local Government Act

Background
The current purposes of the Act will be updated and streamlined by the proposal.

1.2 Role of local government

Proposed Amendment
The council charter in section 8 should be replaced by provisions that:

- describe the role of local government; and
- establish guiding principles for local government.

The role of local government should be to enable local communities to be healthy and prosperous by:

- providing strong and effective elected representation, leadership, planning and decision making;
- working cooperatively with other bodies, including other levels of government, to pursue better community outcomes;
- effective stewardship of lands and other assets to affordably meet current and future needs;
- endeavouring to provide the best possible value for money for residents and ratepayers;
- strategically planning for and securing effective and efficient services, including regulatory services, to meet the diverse needs of members of local communities; and
- following the guiding principles of local government.

Current provision:
Section 8

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.1.2 Role and Guiding Principles of Local Government

Background:
The Taskforce's proposed role of local government was similar but has been modified in this proposal to:

- more closely reflect the vision for Local Government in NSW agreed to at Destination 2036, including a focus on achieving outcomes and working together within and outside local government;
- adopt clear and simple language and remove duplication;
- reflect the role of councils in enabling outcomes and shaping its local government area through external relationships; and
- focus on the context in which councils operate, rather than prescribe outcomes.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

1.3 The guiding principles of local government

Proposed amendment:
The council charter in section 8 should be replaced by provisions that:

- describe the role of local government; and
- establish guiding principles for local government.

The new guiding principles to be observed in local government should enable councils to:

- actively engage local communities, including through integrated planning & reporting;
- be transparent and accountable;
- recognise diverse needs and interests;
- have regard to social justice principles;
- have regard to the long term and cumulative effects of its actions on future generations;
- foster ecologically sustainable development;
- effectively manage risk;
- have regard to long term sustainability;
- work with others to secure services that are appropriate to meet local needs;
- foster continuous improvement and innovation;
- act fairly, ethically and without bias in the public interest; and
- endeavour to involve and support its staff.

Current provisions:
Section 8

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.1.2 Role and Guiding Principles of Local Government

Background:
The Taskforce's proposed role of local government was similar but has been modified in this proposal to:

- more closely reflect the vision for Local Government in NSW agreed to at Destination 2036, including a focus on achieving outcomes and working together within and outside local government;
- adopt clear and simple language and remove duplication;
- reflect the role of councils in enabling outcomes and shaping its local government area through external relationships; and
- focus on the context in which councils operate, rather than prescribe outcomes.

Towards New Local Government Legislation
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Fit for the Future

2. Structural framework of local government

2.1 The role of the governing body

Proposed Amendment
It is proposed to replace the current prescribed role of the governing body under section 223 which is focussed only on the board-like function of the body. The governing body is the elected representatives of the council (the councillors).

It is proposed to use the Panel's more expansive list as a basis for describing the functions of the governing body:

- to provide effective civic leadership to the community;
- to consult regularly with community organisations and other key stakeholders and keep them informed of council's activities and decisions;
- to direct and control the affairs of the council in consultation with the general manager and in accordance with the Act;
- to ensure as far as possible the financial sustainability of the council;
- to determine and adopt the community strategic plan, delivery program and other strategic plans and policies;
- to determine and adopt a rating and revenue policy and operational plans that ensure the optimum allocation of the council's resources to implement the community strategic plan and for the benefit of the area;
- to make decisions in accordance with those plans and policies;
- to make decisions necessary for the proper exercise of the council's regulatory functions;
- to keep under review the performance of the council and its delivery of services;
- to determine the process for appointment of the general manager and monitor his/her performance; and
- to ensure that the council acts honestly, efficiently and appropriately in carrying out its statutory responsibilities.

Current provision:
Section 223

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 26 Political Leadership and Good Governance (Box 19)
T: 3.1.4 Roles and Responsibilities of Council Officials
T: 3.3.18(7)d Other Matters

Background:
The proposed amendments are intended to:

- provide greater clarity to the roles of councillors by describing their collective role as members of the governing body, as distinct from their individual role as elected representatives; and
- embed strategic principles and practices within the prescribed role of the governing body.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

2.2 The number of councillors

Proposed Amendment:
Section 224 prescribes the numbers of councillors a council may have (between 5 and 15) and the manner in which that number is to be determined.

It is proposed to amend section 224 to require that councils must have an odd number of councillors and mayor.

Current provisions:
Section 224 and 224A

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 26 Political Leadership and Good Governance (Box 22)

Background:
The proposed amendment would give effect to the Government's response to the Panel's recommendation that councils comprise an odd number of councillors. This change will reduce the risk of the mayoralty being determined by lot and decisions being made on the casting vote of the mayor.

2.3 Rural councils

Proposed Amendment
It is proposed to allow for small rural councils to apply to the Minister for Local Government for one-off approval to:

- reduce councillor numbers and abolish wards without the need for a constitutional referendum;
- omit the current restriction that prevents councils from making an application for a decrease in the number of councillors that would result in the number of councillors for each ward being fewer than 3; and
- reduce the number of council meetings to be held in a year to below the minimum of 10 currently required under section 365.

Current provisions:
Sections 224A and 365

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 12 Rural Councils (Box 33)

Background:
The Panel recommended that consideration be given to supporting the streamlining of some small rural councils' governance arrangements to allow efficiencies and savings. These councils are in rural-remote areas with small populations. It is proposed to provide a one-off voluntary process to allow the Minister to approve small rural council proposals to abolish wards, change councillor numbers and allow numbers of meetings that are less than the thresholds set out in the Act where proposed by some small rural councils in their Fit for the Future submissions.

This proposal is intended to facilitate a flexible response to the needs and circumstances of different regions.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

3. The governing body of councils

3.1 The role of the mayor

Proposed Amendment
It is proposed to describe the role of the mayor differently.

The mayor should have all the prescribed responsibilities of a councillor in addition to the following additional responsibilities:

- to be the leader of the council and the community of the local government area, and advance community cohesion;
- to promote civic awareness and, in conjunction with the general manager, ensure adequate opportunities and mechanisms for engagement between the council and the local community;
- to be the principal member and spokesperson of the governing body and to preside at its meetings;
- to ensure that the business of meetings of the governing body is conducted efficiently, effectively and properly in accordance with provisions of the Act;
- to lead the councillors in the exercise of their responsibilities and in ensuring good governance;
- to ensure the timely development of the governing body's strategic plans and policies, and to promote their effective and consistent implementation, including by promoting partnerships between the council and key stakeholders;
- to exercise, in cases of necessity, the policy-making functions of the governing body between meetings of the council;
- to represent the governing body on regional organisations and in inter-government forums at regional, State and federal levels;
- to advise, manage and provide strategic direction to the general manager in accordance with the council's strategic plans and policies;
- to lead performance appraisals of the general manager;
- to carry out the civic and ceremonial functions of the mayoral office; and
- to exercise such other functions as the governing body determines.

Current provision:
Section 226

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 26 Political Leadership and Good Governance (Box 21)
T: 3.1.4 Roles and Responsibilities of Council Officials
T: 3.3.18(7)d Other Matters

Background
Some aspects of the prescribed role of the mayor recommended by the Panel have not been included in this proposal as a result of previous stakeholder consultation.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

3.2 The mayor's term of office

Proposed Amendment
The current length of term for a mayor is either:

- one year for mayors elected by councillors; or
- four years for mayors popularly elected by the electors.

This would be changed so that mayors elected by councillors are to hold office for a minimum of two years, as recommended by the Panel, with the option of electing a person to the office for the whole four year term.

Also in accordance with the Panel's recommendation, and the Government's response, it proposed that it be compulsory for councillors to vote in a mayoral election.

Section 230 will also be amended to clarify that the office of mayor becomes vacant upon the person holding the office ceasing to hold civic office or on the occurrence of a casual vacancy.

Current provision:
Section 230

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 26 Political Leadership and Good Governance (Box 22)
T: 3.3.1(8) Elections

Background
The proposed amendments will

- enhance political leadership and stable governance of council to give effect to the Government's commitment to extend the term of mayors elected by councillors to a minimum of two years, as well as make voting in mayoral elections compulsory; and
- address an existing ambiguity in the Act that has allowed some Mayors to purport to exercise the role of mayor after they cease to hold office as a councillor after an election.

Although the Panel and Taskforce did not describe a four year mayoral term option – just proposing a *minimum* of two years – this extension is being explored as a way to further support stable local government.

Compulsory voting by councillors for a mayoral election (as recommended by the Panel) may also address community concern that too many mayors are chosen by pulling lots out of a hat. However, it is important that a positive statutory obligation to vote does not undermine the democratic process (such as by excluding a person who has a genuine reason for being absent) or be too easy to avoid for reasons that are not bona fide. To meet those policy ends, the Act could provide:

- councillors may cast a vote in a mayoral election by proxy;
- councillors may cast a vote by telephone, video-conference, or electronic means;
- if a councillor is absent from the meeting at the time of the vote so that the number of remaining councillors voting is even-numbered, and has not cast a vote by proxy or electronic means, then another councillor must be excluded from voting by way of a 'draw from a hat'; and
- a regulation-making power in relation to process of electing mayors by councillors.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

3.3 The role of councillors

Proposed Amendment
It is proposed to recast section 232 so that it focuses on individual responsibilities of councillors, rather than their responsibilities as members of the governing body of a council. The role and responsibilities of an individual councillor, (including the mayor), should be:

- to be an active and contributing member of the governing body;
- to make considered and well informed decisions;
- to represent the collective interests of residents, ratepayers and the wider community of the local government area;
- to facilitate communication between the community and the governing body;
- to be accountable to the community for the local government's performance; and
- to uphold and represent accurately the policies and decisions of the governing body.

Current provision:
Section 232

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 26 Political Leadership and Good Governance (Box 19)
T: 3.1.4 Roles and Responsibilities of Council Officials
T: 3.3.18(7)d Other Matters

Background
Section 232 currently sets out a "dual role" for councillors as members of the governing body and as elected representatives and has been a source of confusion.

The proposed amendments are intended to provide greater clarity for councillors and communities by prescribing councillors individual roles as elected representatives separately from their collective roles as members of the governing body, as recommended by the Panel.

3.4 Councillors' term of office

Proposed Amendment
Section 234 prescribes the circumstances in which a civic office becomes vacant. Section 234 will be amended to clarify that a vacancy will occur in the civic office of a councillor where they are elected to another civic office in the council, (ie the office of a popularly elected Mayor) something that is currently not clear.

Current provisions:
Sections 233 and 234

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
None

3.5 Oath or affirmation of office

Proposed Amendment
It is proposed to require all councillors, including the Mayor to take an oath or affirmation of office in the prescribed form before commencing duties.

The oath or affirmation of office is to be taken within 1 month of election to office and councillors are not to undertake their duties until they do so. Where a councillor fails to take an oath or affirmation, his or her office will be declared vacant.

Current provision:
None

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.18(2) Other Matters

Background
An oath or affirmation of office operates as a mechanism for inducting councillors into their role and reinforcing the serious nature of the role and the chief responsibilities and duties the role entails. Both Victoria and Queensland require their councillors to take an oath of office. It is proposed that the NSW law should operate in a similar way to Victoria and Queensland.

Towards New Local Government Legislation
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Fit for the Future

3.6 Councillors' expenses and facilities

Proposed Amendment
Sections 252 to 254 relate to the payment of expenses and provision of facilities to councillors and the adoption of policies governing this. It is proposed to amend sections 252 and 253 to:

- replace the requirement under section 252 for councils to annually adopt an expenses and facilities policy with one simply requiring councils to adopt a policy within the first 12 months of their terms; and
- remove the requirement under section 253 for councils to provide the Office of Local Government annually with a copy of their adopted policies and an assessment of public submissions made in relation to their adoption.

Current provisions:
Sections 235 – 254A and Schedule 1

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.18(3) Other Matters

Background
The proposed amendments are designed to reduce the compliance burden on councils of being required to annually exhibit, consult and adopt their councillor expenses and facilities policies even where no change is made to them and to provide copies to the Office of Local Government. It is also noted that open access obligations apply now to councils under the *Government Information (Public Access) Act 2009*.

3.7 Mayor/councillor professional development

Proposed Amendment
New provisions are proposed to require the following:

- Councils are to develop an induction program for newly elected and returning councillors and a specialist supplementary program for the mayor to assist them in the performance of their functions. The induction program is to be available for delivery within 4 months of the election.
- Each year, councils are to develop an ongoing professional development program for the mayor and each councillor to assist them in the performance of their functions to be delivered over the coming year.
- In determining the content of the induction and ongoing professional development programs, the council is to have regard to the specific needs of each individual councillor (including the mayor) and of the governing body as a whole and the requirements of any guidelines issued by the Office of Local Government.
- The content of the induction and ongoing professional development program is to be determined in consultation with the mayor, the council as a whole and individually with each of the councillors.
- Councils are to include details of the content of the induction and ongoing professional development offered to the mayor and each councillor and whether or not they participated in the training or development offered in the council's annual report.

Current provisions:
None

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 26 Political Leadership and Good Governance (requirement for mandatory professional development)
P: 27 Political Leadership and Good Governance (linking remuneration with completion of professional development program).

Background
Some aspects of the Panel recommendation have not been included in this proposal as a result of previous stakeholder consultation. The proposed approach has the following benefits:

- it places a responsibility on all councils to offer an induction and ongoing professional development programs to their councillors;
- it allows councils the freedom to determine the content of those programs based on local and individual needs at the same time as allowing the Office of Local Government to have input into content through guidelines; and
- it places responsibility for participation on councillors and makes them accountable to the community that elected them for any failure to do so.

Towards New Local Government Legislation
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Fit for the Future

3.8 Role and functions of administrators

Proposed Amendment
Several provisions of the Act provide that the administrator is to exercise the functions of the council without articulating what the nature of their role is within a council.

It is proposed to address this ambiguity and align the role of the administrator with the proposed prescribed role of the mayor and councillors by amending these sections to provide that:

- Where a sole administrator is appointed to a council, they are to exercise the role and responsibilities of the mayor and a councillor as prescribed under the Act.
- Where more than one administrator is appointed, all administrators are to exercise the role and responsibilities of councillors as prescribed under the Act and one, as specified by the relevant instrument of appointment, is to exercise the role and responsibilities of the mayor as prescribed under the Act in addition to those of a councillor.

Current provisions:
Sections 255-259, 438I, 438M and 438Y

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
None

Background
The proposed amendments are designed to address an existing ambiguity in the legislation that has been unhelpful in councils under administration. Providing greater clarity in relation to the roles of administrators aligns with the new descriptions that are being proposed for mayors and councillors.

3.9 Financial controllers

Proposed Amendment
A financial controller is responsible for implementing financial controls and related duties. Where a financial controller is appointed, a council may only make payments that are authorised or countersigned by the financial controller.

It is proposed to allow the Minister for Local Government to appoint a financial controller to a council that is performing poorly with respect to its financial responsibilities and/or is at high financial sustainability risk, in conjunction with issuing a performance improvement order.

A financial controller would only be appointed through the existing performance improvement order process after information is gathered or an investigation undertaken that shows the council is not performing, a notice of the proposed remedial action has been issued to a council and the Minister has considered the council's submissions with respect to the notice.

Current provision:
None

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
None

Background:
The Minister has an existing power to issue a performance improvement order against poorly performing councils to compel them to take steps to improve their performance. Before issuing a performance improvement order, the Minister must first give the council notice of his intention to do so and consider submissions by the council.

As part of the exercise of these powers, the Minister may appoint a temporary adviser to the council. If a temporary adviser is appointed, the council, councillors and members of the staff of the council are required to co-operate with the temporary adviser and to provide any information or assistance the temporary adviser reasonably requires to exercise his or her functions.

It is proposed to complement these powers with a new power for the Minister to appoint a financial controller to a council. These powers will be modelled on those that exist in Queensland.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

3.10 Meetings

Proposed Amendment
In relation to conduct of meetings, amendments consistent with the following are proposed :

- provide that the Regulation may prescribe a Model Code of Meeting Practice (a Model Meeting Code);
- provide that the Model Meeting Code may include mandated and non-mandatory "best practice" provisions;
- require councils to adopt a Code of Meeting Practice (an adopted meeting code) that at a minimum incorporates the mandated provisions of the Model Meeting Code;
- allow a council's adopted meeting code to supplement the provisions contained in the Model Meeting Code;
- provide that a provision of a council's adopted meeting code will be invalid to the extent of any inconsistency with the mandated provisions of Model Meeting Code;
- require council and committee meetings to be conducted in accordance with the council's adopted meeting code;
- require councils to review and adopt a meeting code within 12 months of each ordinary election; and
- retain the existing requirements under sections 361 - 363 in relation to the adoption and amendment of a meeting code and public consultation in relation to this.

Aspects of the current meetings provisions in the Act and the Regulation will be updated and incorporated into a new Model Meeting Code.

Current provisions:
Sections 9-11, and 360-376
Clauses 231-273

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.2 Meetings

Background
The Model Meeting Code will comprise mandatory provisions and non-mandatory best practice provisions. Councils will be required to adopt meetings codes that incorporate the mandatory provisions but will not be obliged to adopt the non-mandatory best practice provisions in order to respond to local requirements. The mandatory provisions will largely incorporate the existing meetings provisions, which will be updated to:

- address existing procedural ambiguities; and
- modernise procedural requirements.

It is expected that the new Code will initially include the provisions relating to meeting processes now found in the Act and Regulation, but be reordered to reflect the order in which events usually occur in meetings.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

3.11 Delegation of functions

Proposed Amendment
It is proposed to include amendments to section 377, which were introduced into Parliament previously but lapsed prior to the 2015 election, to remove the restriction on the delegation of the acceptance of tenders.

It is also proposed to allow councils to delegate the provision of community financial assistance for the purpose of exercising its functions where:

- the financial assistance is part of a specific program;
- the program's details have been included in the council's draft operational plan for the year in which the financial assistance is proposed to be given;
- the program's proposed budget for that year does not exceed 5 per cent of the council's proposed income from the ordinary rates levied for that year; and
- the program applies uniformly to all persons within the council's area or to a significant proportion of all persons within the area.

Amendments may be required facilitate the proposal to allow councils to delegate a regulatory function to another council or a joint organisation of councils, to support future collaboration and resource sharing.

Current provisions:
Sections 377-381

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.8 Delegations
T: 3.3.10 Procurement

Background
The amendments are designed to:

- Reduce red tape
- Remove impediments to collaboration, and
- Suport the use of Integrated Planning and Reporting to guide council decisions on financial assistance.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

4. Elections

4.1 Extension of the option of universal postal voting to all councils

Proposed Amendment
It is proposed to amend section 310B to provide that the option of universal postal voting is available to *all* councils after the next ordinary election.

Current provisions:
Sections 310B
Clauses 313 and 321

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.1(1) Elections

Background
The Taskforce's election-related recommendations have largely been implemented through the *Local Government Amendment (Elections) Act 2014* which was legislated to give effect to the recommendations of the Joint Standing Committee on Electoral Matters' inquiry into the 2012 Local Government elections.

The one outstanding action arising from the Government response to the Committee's recommendations is the extension of the option of universal postal voting to all councils. Currently this is only available to the City of Sydney. In its response to the Committee's recommendation to give councils the option of universal postal voting, the Government indicated that this option would be made available to all councils following the 2016 elections. For councils that do not choose universal postal voting, the existing postal and pre-poll voting qualifications will remain.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

5. Council's workforce

5.1 Determination of the organisation structure

Proposed Amendment
It is proposed to amend the Act to provide that:

- the organisation structure is to be determined on the advice of the general manager;
- the adopted structure must accord with the priorities set out in the council's community strategic plan and delivery program;
- the adopted structure may only specify the roles and relationships of the general manager, designated senior staff and other staff reporting directly to the general manager; and
- the general manager is to be responsible for determining the balance of the organisation structure but must do so in consultation with the governing body.

Current provisions:
Sections 332-333

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 29
T: 3.3.3 (1)

Background
The current provisions are unclear about the respective roles of general managers and councils in determining the organisation structure. This has been the source of conflict within councils.

The proposed approach has the benefit of:

- addressing this ambiguity making it clear what the respective responsibilities of the council and the general manager are;
- making it clear that the organisation structure has to be determined on the advice of the general manager (ie councils cannot unilaterally restructure without the input of the general manager); and
- clearly aligning the determination of the organisation structure with the delivery of a council's Integrated Planning and Reporting objectives.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

5.2 The role of general managers

Proposed Amendment
It is proposed to describe the role and responsibilities of the general manager in the Act consistent with the following:

- to conduct the day-to-day management of the council in accordance with the governing body's strategic plans and policies;
- to advise the mayor and the governing body on the development and implementation of policies and programs, including the appropriate form and scope of community consultation;
- to prepare, in consultation with the mayor and governing body, the community strategic plan and the council's resourcing strategy, delivery program and operational plan, annual report and community engagement strategy;
- to certify that Integrated Planning and Reporting requirements have been met in full, and that council's annual financial statements have been prepared correctly;
- to ensure that the mayor and councillors receive timely information, advice and administrative and professional support necessary for the effective discharge of their responsibilities;
- to implement lawful decisions of the governing body in a timely manner;
- to exercise such of the functions of the governing body as are delegated by the governing body to the general manager;
- to appoint staff in accordance with an organisation structure and resources approved by the governing body
- to direct and dismiss staff;
- to implement the council's workforce management strategy; and
- to undertake such other functions as may be conferred or imposed on the general manager by or under the Act or any other Act.

Current provision:
Section 335

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 28: Political Leadership and Good Governance (Boxes 23 and 24)
T: 3.1.4 Roles and Responsibilities of Council Officials
T: 3.3.3 Appointment and Management of Staff
T: 3.3.18(7)d Other Matters

Background
The current provisions are unclear about the respective roles of general managers and councils in determining the organisation structure. This has been the source of conflict within councils.

The proposed approach has the benefit of:

- addressing this ambiguity making it clear what the respective responsibilities of the council and the general manager are;
- making it clear that the organisation structure has to be determined on the advice of the general manager (ie councils cannot unilaterally restructure without the input of the general manager); and
- clearly aligning the determination of the organisation structure with the delivery of a council's Integrated Planning and Reporting objectives.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

5.3 The requirement to report annually to the council on senior staff contractual conditions

Proposed Amendment
It is proposed to omit the requirement under section 339 for general managers to report annually to the council on the contractual conditions of senior staff.

Current provision:
Section 339

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
None

Background
Senior staff are now all employed under the approved standard contract for senior staff rendering this requirement redundant.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

6. Ethical standards

6.1 Consolidation of the prescription of ethical standards

Proposed Amendment
Provisions in the Act and the Regulation relating to the disclosure of pecuniary interests and the management of pecuniary conflicts of interests will be replicated in the Model Code of Conduct.

Current provisions:
Sections 441 – 459
Clauses 180 - 192

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.6 Code of Conduct
T: 3.3.7 Pecuniary Interest

Background
The proposed amendments are designed to consolidate the imposition, administration and regulation of the ethical obligations of council officials into a single instrument, the *Model Code of Conduct for Local Councils in NSW* (the Model Code).

Currently council officials need to be familiar with their obligations under both the Model Code and the pecuniary interest provisions of the Act. The separate regulation of the obligation of council officials to disclose and appropriately manage pecuniary conflicts of interests is a historical anomaly that arose from the fact that these provisions predated the prescription of a Model Code of Conduct and the provision for a disciplinary regime with respect to councillor misconduct. Replication will allow the consolidation of ethical standards into a single instrument.

The current misconduct investigative provisions in the Act will apply to pecuniary interest matters and replace the pecuniary interest investigative procedures (see [6.2] below). The prescribed *Procedures for the Administration of the Model Code of Conduct for Local Councils in NSW* (the Model Code Procedures) will continue to require the referral of pecuniary interest breaches to the Office of Local Government and these will be dealt with under the misconduct provisions of the Act.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

6.2 Investigation of pecuniary interest breaches

Proposed Amendment
It is proposed to omit the provisions relating specifically to the investigation of complaints alleging breaches of the pecuniary interest provisions. These will instead be dealt with under the existing misconduct provisions.

General managers (and mayors in the case of allegations concerning general managers) will continue to be obliged to refer pecuniary interest breaches to the Office of Local Government under the prescribed Model Code Procedures. These will continue to be investigated by the Office and referred to the NSW Civil and Administrative Tribunal (NCAT) under the misconduct provisions where appropriate. As is currently the case with respect to misconduct matters, it will also be open to the Chief Executive to take disciplinary action with respect to less serious pecuniary interest breaches instead of referring them to the Tribunal.

The Tribunal's powers to take disciplinary action against council staff, committee members and advisors with respect to pecuniary interest breaches are to be retained. The provisions that apply to proceedings before the NCAT generally and the NCAT's consideration of misconduct matters will also be retained.

Current provisions:
Sections 440F – 440P
Sections 460 – 486A

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.0.0 Approach and Principles for the Development of the New Act
T: 3.2.1 Integrated Planning and Reporting

Background
The proposed amendments are required to give effect to the amendments that will see the prescription of all ethical standards under the Model Code of Conduct for Local Councils. All breaches (including in relation to the obligation to disclose and appropriately manage pecuniary conflicts of interests) will be dealt with under the existing misconduct provisions of the Act.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

7. Councils' strategic framework

7.1 Integrated planning and reporting principles

Proposed Amendment
New provisions will be included to establish overarching Integrated Planning and Reporting principles and require councils to undertake strategic business planning in accordance with those principles.

The proposed Integrated Planning and Reporting principles will provide that councils (together with their communities, other councils and stakeholders) are proposed to include:

- lead and inspire residents, businesses and others to engage with their council;
- identify and prioritise key community needs and aspirations;
- develop strategic goals to meet these needs and aspirations;
- identify activities and prioritise actions to work towards these strategic goals;
- plan holistically to deliver on strategic goals within their resources;
- foster community participation to better inform local and state decision making;
- manage council's current and future financial sustainability;
- appropriately adapt to changing circumstances, evidence and priorities;
- proactively manage risks to the community and its council;
- be transparent and accountable for decisions and omissions;
- maintain an integrated approach to planning, delivery, monitoring and reporting;
- collaborate to maximise achievement of key community outcomes; and
- honestly review and evaluate progress on a regular basis.

Current provisions:
Sections 402 – 406 (Note there are mandatory guidelines)

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.0.0 Approach and Principles for the Development of the New Act
T: 3.2.1 Integrated Planning and Reporting

Background
The proposed amendments will ensure that the purpose and principles of Integrated Planning and Reporting as a strategic business planning tool are clearly reflected in the Act. These provisions will:

- set out the overarching principles of Integrated Planning and Reporting;
- require strategic business planning to be undertaken by councils in accordance with the prescribed Integrated Planning and Reporting principles and provisions;
- guide how Integrated Planning and Reporting documents are to be adopted/endorsed and reviewed; and
- require integrated planning to be directed to achieving better outcomes through continuous improvement.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

7.2 Streamlining the existing integrated planning and reporting provisions

Proposed Amendment
The current Integrated Planning and Reporting provisions are contained in sections 402 to 406. These provisions will be amended so that they are confined to setting out the purpose of each document and when they must be delivered. Detailed process requirements for how this must be done will be moved to the Regulation.

Current provisions:
Sections 402 – 406

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.0.0 Approach and Principles for the Development of the New Act
T: 3.2.1 Integrated Planning and Reporting

Background
These amendments are designed to give effect to the Taskforce's recommendations that the existing Integrated and Planning and Reporting provisions be simplified with prescriptive detail contained in the Regulation.

7.3 Council's integrated planning and reporting to reflect regional priorities

Proposed Amendment
Amendments are proposed to ensure that regional priorities are reflected in individual councils' strategic business planning. In particular, amendments are proposed to:

- require council's community strategic plans to identify key regional priorities and strategies for the council, developed with adjoining councils and agencies; and
- require delivery programs to address key regional strategies including council actions and any proposed joint programs agreed regionally.

Current provisions:
Sections 402 and 404

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.0.0 Approach and Principles for the Development of the New Act
T: 3.2.1 Integrated Planning and Reporting

7.4 Expanded scope of delivery programs

Proposed Amendment
Section 404 will be amended to clarify that delivery programs are to capture all council activities.

Current provisions:
Section 404 and 406

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.0.0 Approach and Principles for the Development of the New Act
T: 3.2.1 Integrated Planning and Reporting

Background
This amendment is designed to embed in the Act a requirement that is currently reflected in the mandatory Integrated Planning and Reporting Guidelines.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

7.5 Fiscal sustainability

Proposed Amendment
The *Local Government (General) Regulation 2005*, which provides for an annual statement of revenue policy in each operational plan, will be amended to require councils to:

- establish revenue policies with a view to ensuring fiscal sustainability; and
- provide a clear rationale for how rating systems are structured and what they are designed to achieve.

The Regulation will also set out in more detail what is required of councils' resourcing strategy to clarify the purpose and objectives of workforce, asset and long term financial planning. This will draw on the essential elements in the current Integrated Planning and Reporting guidelines to help councils produce more robust and useful strategies in these key areas.

Current provision:
Clause 201

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 2 Fiscal Responsibility (Box 9)
P: 5 Strengthening Revenues

Background
The amendments will give effect to the Panel's recommendations to embed the principle of fiscal sustainability through Integrated Planning and Reporting.

7.6 Expanded scope of councils' community engagement strategies

Proposed Amendment
It is proposed to broaden the existing requirement that a council must adopt a community engagement strategy to inform the development of its community strategic plan. If amended, the Act would require the adoption of a community engagement strategy to inform *all* council activities (other than routine business-as-usual operations), not only those directly associated with development of the council's Integrated Planning and Reporting framework.

This would be done by making the adoption of a community engagement strategy a general legislative obligation.

A council's community engagement strategy would need to meet minimum prescribed requirements. It is anticipated, for example, that guidelines would prescribe minimum public consultation requirements for specific activities including the development of the components of a council's Integrated Planning and Reporting framework, and include a requirement to periodically evaluate the efficacy of consultation methodologies.

It is proposed to accommodate the existing provisions relating to community polls within the proposed standalone community engagement provisions.

Current provisions:
Sections 14, 18 – 20, 402

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.0.0 Approach and Principles for the Development of the New Act
T: 3.2.2 Community Engagement
T: 3.3.18(7)b Other Matters

Background
The requirement for a single overarching community engagement strategy provides a framework for councils to engage with their communities in a strategic, ongoing, flexible and locally appropriate way. It also provides a single, consistent point of reference in the Act for other provisions requiring councils to undertake consultation for specified activities.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

8. Council performance

8.1 Annual reports

Proposed Amendment
It is proposed to require the information reported in councils' annual reports to be endorsed as factually accurate by an internal audit committee. As noted below (at [8.4]), councils will be required to establish internal audit committees with a majority of independent members and an independent Chair.

Current provisions:
Sections 428-428A

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 22 Improvement, Productivity and Accountability (Box 17)
T: 3.2.3 Performance of Local Government

Background
The proposed amendment is designed to provide an assurance mechanism and to give communities confidence in the integrity of the information their councils report about their council's performance through its annual report.

8.2 State of the environment reports

Proposed Amendment
It is proposed to remove the requirement under section 428A for a council to include a State of the environment report in its annual report every 4 years. Councils would instead be required to report on environmental issues relevant to the objectives established by the community strategic plan in the same way they are currently required to report on the achievement of other objectives set in their community strategic plans (that is, through their annual reports and the 4-yearly end of term report).

Current provision:
Section 428A

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.2.1 Integrated Planning and Reporting

Background
This amendment is designed to:

- reduce the compliance burden on councils arising from the preparation of a separate state of the environment report every 4 years; and
- help councils achieve their environmental objectives by consolidating the reporting of those objectives into their Integrated Planning and Reporting frameworks.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

8.3 Performance measurement

Proposed Amendment
It is proposed to allow for the introduction of a performance management and reporting framework that should:

- provide a statutory basis to establish new indicators and benchmarks for reporting purposes;
- expressly require councils to collect and report against these indicators in accordance with guidelines;
- establish annual performance statements as part of council annual reports, which will be subject to oversight and attestation requirements;
- align performance reporting to the Integrated Planning and Reporting cycle; and
- provide the capacity to establish a state-wide community satisfaction survey.

Current provision:
Section 429

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 2 Fiscal Responsibility
P: 18 Improvement, Productivity and Accountability
T: 3.2.3 Performance of Local Government

Background
The proposed framework is a modified version of the one recently adopted by Victoria. Further work will be undertaken with the local government sector to develop the performance management framework in the coming months.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

8.4 Internal audit

Proposed Amendment
It is proposed to introduce a mandatory requirement for councils to have an internal audit function. To this end, it is proposed that new provisions will require all councils to have an internal audit function:

- with broad terms of reference covering compliance, risk, fraud control, financial management, good governance, performance in implementing their community strategic plan and delivery program, service reviews, collection of required indicator data, continuous improvement and long term sustainability; and
- that focuses on councils adding value to, and continuous improvement in, the performance of their functions.

All councils will be required to comply with guidelines issued by the Chief Executive of the Office of Local Government with respect to the implementation of their internal audit functions. All councils will appoint an audit, risk and improvement committee that meets the following requirements:

- audit committees must have a majority of independent members and an independent chair;
- general managers may not be members of audit committees (but may attend meetings unless excluded by the committee); and
- the Chair of the audit committee must report at least biannually to a council meeting on the organisation's performance in financial management, good governance and continuous improvement.

Councils will be permitted to have joint arrangements for internal audit and share audit committees.

Current provisions:
Discretionary guidelines issued under section 23A

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 22 Improvement, Productivity and Accountability (Box 17)

Background
Mandating internal audit will:

- entrench within each council an internal assurance mechanism that offers an alternative to prescription and external oversight as a means of addressing risk, ensuring compliance and promoting best practice;
- drive and inform a culture of continuous improvement;
- facilitate reporting; and
- promote increased accountability.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

8.5 Sector-wide performance audits by the Auditor-General

Proposed Amendment
To identify trends and opportunities for improvement across the sector as a whole, it is proposed to compliment the mandated requirement for internal audit by empowering the Auditor-General to conduct issue-based performance audits in key areas of local government activity.

Current provision:
None

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 22 Improvement, Productivity and Accountability (Box 17)

Background
As noted by the Panel, such audits have been conducted by the Victorian Auditor-General for many years. Topics are selected in consultation with the sector, and recent audits have covered important issues such as rating practices, sustainability of small councils, business planning, fees and charges, and use of development contributions. They usually involve a small sample of representative councils. The audits do not question the merits of councils' policy objectives. Rather, the purpose of the audit is to assess whether councils are achieving their objectives and operating economically, efficiently and effectively.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

8.6 Financial management

Proposed Amendment
It is proposed to adopt a more 'principles-based' approach to the management of council funds by moving detailed requirements to the Regulation and the *Local Government Code of Accounting Practice and Financial Reporting*, which is prescribed under the Act.

New provisions in the Act will set out objectives and principles that are to inform councils' financial management practices and that align them with the objectives set through councils' Integrated Planning and Reporting frameworks. These provisions will ensure that the financial targets for councils are to be those reflected in their long term financial plans, delivery programs and operational plans.

They will also establish the following principles of sound financial management:

- responsible and sustainable spending, aligning general revenue and expenses as per the councils' planning documents.
- responsible and sustainable infrastructure investment for the benefit of its community.
- effective financial and asset management, including sound policies and processes for:
    - performance management and reporting, and
    - asset maintenance and enhancement, and
    - funding decisions, and
    - risk management practices.
- achieving intergenerational equity, including ensuring that:
    - policy decisions are made having regard to their financial effects on future generations, and
    - the current generation funds the cost of its services.

Current provisions:
Sections 408 – 411

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.9 Financial Governance

Background
The proposed amendments are designed to start to give effect to the Taskforce's recommendations for a more "principles-based" approach to the regulation of councils' financial governance in the Act, with prescriptive detail moved to the Regulation and other subordinate instruments wherever practical.

The proposed principles of sound financial management are modelled on those contained in the *Fiscal Responsibility Act 2012*.

Towards New Local Government Legislation
Explanatory Paper: proposed *Phase 1* amendments

Fit for the Future

8.7 Financial reporting

Proposed Amendment
Consistent with the proposal that councils' financial obligations be recast to establish a "principles-based" approach in the Act detailed reporting requirements should be specified instead in the Regulation and the *Local Government Code of Accounting Practice and Financial Reporting*.

Current provisions:
Sections 412-421

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
T: 3.3.9 Financial Governance

Background
The proposed amendments are designed to give effect to the Taskforce's recommendations for a more "principles-based" approach to the regulation of councils' financial governance in the Act, with prescriptive detail moved to the Regulation and other subordinate instruments.

8.8 External audit

Proposed Amendment
It is proposed to place Local Government audits under the aegis of the NSW Auditor-General.

There will also need to be transitional arrangements in the Bill to ensure that existing auditor appointments can be brought to an orderly conclusion, with minimal disruption to councils, current auditors and the Audit Office of New South Wales.

Current provisions:
Sections 422-427

Independent Local Government Review Panel (P)/Local Government Acts Taskforce (T) recommendation:
P: 3 Fiscal Responsibility

Background
As noted in the Government response to the Panel and Taskforce, giving the Auditor-General oversight of council financial audit will improve quality, consistency and timeliness and financial management.

The Office of Local Government is currently working with the Audit Office on the development and implementation of the proposed amendments, including transitional arrangements.

ATTACHMENT 2

Campbelltown City Council Assessment of the proposed Phase 1 Amendments to the Local Government Act 1993	
Proposed Phase 1 Amendment	**Council position on change**
1. Guiding Principles for the Act and local government	
1.1 Purposes of the Local Government Act	Support
1.2 Role of local government	Support
1.3 The guiding principles of local government	Support
2. Structural framework of local government	
2.1 The role of the governing body	Support
2.2 The number of councillors	Support
2.3 Rural councils	Neutral Stakeholders residing in and serving small rural areas are better placed to offer feedback on this proposal
3. The governing body of councils	
3.1 The role of the mayor	Support
3.2 The mayor's term of office	Support
3.3 The role of councillors	Support
3.4 Councillor's term of office	Support
3.5 Oath or affirmation of office	Support
3.6 Councillor's expenses and facilities	Support Council notes that 4 yearly review cycles may be satisfactory as a minimum requirement, but notes that more frequent review of such a policy to take account, for example, of changes in the nature and level of demands on Councillors and changes in technology, may be required. Council supports removing the requirement to send the policy to the OLG, as this information is publicly accessible on councils websites
3.7 Mayor/councillor professional development	Support
3.8 Role and functions of administrators	Support
3.9 Financial controllers	Support
3.10 Meetings	Support
3.11 Delegations of functions	Support
4. Elections	
4.1 Extensions of the option of universal postal voting to all councils	Support

Campbelltown City Council Assessment of the proposed Phase 1 Amendments to the Local Government Act 1993	
Proposed Phase 1 Amendment	**Council position on change**
5. Council's workforce	
5.1 Determination of the organisation structure	Support
5.2 The role of general managers	Support
5.3 The requirement to report annually to the council on senior staff contractual conditions	Support
6. Ethical Standards	
6.1 Consolidation of the prescription of ethical standards	Support
6.2 Investigation of pecuniary interest breaches	Support
7. Council's strategic framework	
7.1 Integrated planning and reporting principles	Support
7.2 Streamlining the existing integrated planning and reporting provisions	Support
7.3 Council's integrated planning and reporting to reflect regional priorities	Support
7.4 Expanded scope of delivery programs	Support
7.5 Fiscal sustainability	Support
7.6 Expanded scope of council's community engagement strategies	Support
8. Council Performance	
8.1 Annual Reports	**Disagree** The annual reports include information about the status of Delivery Program and Operational Plan actions and, as such, the proposal fundamentally broadens the role and responsibilities of internal audit committees. It is questionable whether this is reasonably within the remit of Council's internal audit committee or practicably possible for the Committee to undertake. The details of this proposed amendment should be subjected to closer scrutiny in line with recommendations emerging from the current IPART *Review of reporting and compliance burdens on Local Government.*
8.2 State of the environment reports	Support

Campbelltown City Council Assessment of the proposed Phase 1 Amendments to the Local Government Act 1993	
Proposed Phase 1 Amendment	**Council position on change**
8.3 Performance measurement	Support
8.4 Internal audit	Support
8.5 Sector-wide performance audits by the Auditor-General	Support
8.6 Financial management	Support
8.7 Financial reporting	Support
8.8 External audit	Support

1.2 National General Assembly of Local Government 2016

Reporting Officer

Manager Governance and Risk

Attachments

1. Letter from Australian Local Government Association regarding the 2016 National General Assembly of Local Government (contained within this report)
2. Discussion Paper 2016 Call for Motions (contained within this report)

Purpose

To advise Council that the 2016 National General Assembly (NGA) of Local Government will be held on 19 - 22 June 2016.

History

The National General Assembly (NGA) of Local Government is the major event on the annual Local Government events calendar. The NGA typically attracts more than 800 mayors, councillors and senior officers from councils across Australia and is an opportunity to contribute to the development of national local government policy and receive updates on the major policy issues facing local government nationally.

Report

The Australian Local Government Association (ALGA) is holding the 2016 National General Assembly at the National Convention Centre in Canberra on 19 - 22 June 2016. Council is also advised of the scheduling conflict with the June Council meeting to be held on Tuesday 21 June 2016.

Invitations have been extended to the Prime Minister, the Leader of the Opposition, the Leader of the Australian Greens and relevant Ministers to attend the conference to provide key note addresses.

The theme of the conference is ‘Partners in an Innovative and Prosperous Australia’. This theme reflects the renewed focus across all levels of government on the roles and responsibilities of the public sector and the challenge of meeting communities' needs.

To assist Councils in submitting motions for debate, the ALGA has put together a discussion paper providing guidelines for motions and background information (attachment 2).

To be eligible for inclusion in the NGA Business Papers, motions must follow the following principles:

1. be relevant to the work of local government nationally
2. be consistent with the themes of the Assembly
3. complement or build on the policy objectives of your state and territory local government association
4. propose a clear action and outcome
5. not be advanced on behalf of external third parties which may seek to use the NGA to apply pressure to Board members, to gain national political exposure for positions that are not directly relevant to the work of, or in the national interests of local government.

Motions should generally be in a form that seeks the NGA's support for a particular action or policy change at the Federal level, which will assist local governments to meet local community needs. Councillors are asked to draft their motions in the format prescribed by the ALGA (see below) and to submit as a Notice of Motion for consideration by the Council at the meeting to be held on 22 March 2016.

Motion

National Objective
Why is this a national issue and why should this be debated at the NGA? (Maximum 100 words)

Summary of Key Arguments
Background information and supporting arguments (maximum 300 words).

Council staff will coordinate the online lodgement of motions endorsed by Council.

Officer's Recommendation

1. That the General Manager or their nominee and the Director Business Services be authorised to attend the 2016 National General Assembly of Local Government together with any interested Councillors, with expenses to be met in accordance with Council's policy.

2. That Council determine any motions that are to be submitted.

Committee's Recommendation: **(Kolkman/Hawker)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Mead/Lake)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

That the Officer's Recommendation be adopted.

ATTACHMENT 1

AUSTRALIAN LOCAL GOVERNMENT ASSOCIATION

18 February 2016

FEB23'16 07:45:16 RCVD

Campbelltown City Council
PO Box 57
CAMPBELLTOWN NSW 2560

To the Mayor, Councillors and CEO

2016 National General Assembly of Local Government – Call for Motions

The 2016 National General Assembly of Local Government (NGA), to be held at the National Convention Centre in Canberra between 19th and 22nd June, is an opportunity for councils to identify and discuss national issues of priority for the sector and to agree on possible steps which could be taken to address these issues. Every council has the opportunity to raise relevant issues for debate at the NGA and I invite your council to participate in the 2016 NGA by submitting a motion for consideration.

The Australian Local Government Association (ALGA) Board is calling for motions for the 2016 NGA under the theme of '*Partners in an Innovative and Prosperous Australia*'. This theme reflects the renewed focus across all levels of government on the roles and responsibilities of the public sector and the challenge of meeting our communities' needs.

To be eligible for inclusion in the NGA Business Papers, motions must follow the principles set out by the ALGA Board, namely:

1. Be relevant to the work of local government nationally;
2. Be consistent with the theme of the NGA;
3. Complement or build on the policy objectives of your state and territory local government association;
4. Propose a clear action and outcome; and
5. Not be advanced on behalf of external third parties which may seek to use the NGA to apply pressure to Board members, to gain national political exposure for positions that are not directly relevant to the work of, or in the national interests of, the local government sector.

Please be aware that ALGA reserves the right to reject motions which do not meet these conditions. To assist councils in preparing motions, a Discussion Paper has been prepared and is enclosed with this letter. It is also available on the ALGA website at www.alga.asn.au.

Motions should be submitted via the online form on the website at www.alga.asn.au and should be received by ALGA no later than 22 April 2016. Any administrative inquiries can be directed to ALGA by calling 02 6122 9400.

I encourage you to ensure the views of your Council and your community are represented at the 2016 NGA and accordingly look forward to receiving your Council's motion.

Yours sincerely

Mayor Troy Pickard
President

Geils Court Deakin ACT 2600 ABN 31 008 613 876 PHONE 02 6122 9400 FAX 02 6122 9401 EMAIL alga@alga.asn.au WEB www.alga.asn.au

Call for Motions Guidelines and Background Information

The theme for this year's National General Assembly of Local Government (NGA) is *'Partners in an Innovative and Prosperous Australia'*. The NGA theme reflects current issues being debated nationally and priority issues facing local government and is your opportunity to contribute to the development of national local government policy.

The ALGA Board is now calling for motions for the 2016 NGA.

To assist councils in preparing motions, a Discussion Paper has been prepared and is available at www.alga.asn.au.

To be eligible for inclusion in the NGA Business Papers, motions must meet the following conditions:

1. be relevant to the work of local government nationally
2. be consistent with the themes of the Assembly
3. complement or build on the policy objectives of your state or territory local government association
4. propose a clear action and outcome, and
5. not be advanced on behalf of external third parties that may seek to use the NGA to apply pressure to Board members or to gain national political exposure for positions that are not directly relevant to the work of, or in the national interests of, local government.

Once submitted, motions will be reviewed by the ALGA Board's NGA Sub-Committee as well as by state and territory local government associations to determine their eligibility for inclusion in the NGA Business Papers. When reviewing motions, the sub-committee considers the importance and relevance of the issue to local government. Please note that motions should not be prescriptive in directing how the matter should be pursued. Any motion deemed to be primarily concerned with local or state issues will be referred to the relevant state or territory local government association, and will not be included in the Business Papers. The sub-committee reserves the right to reject any motions which are not consistent with the conditions set out above, or to allocate these motions to the reserve section of the debate business papers to be dealt with only if time permits.

Through the review process, minor edits may be made to motions to ensure they can be included in the Business Papers. These edits will change the motion to call for action (for example to 'call on the Australian Government' to do something) to ensure relevance to local government nationally by removing state-specific references, or to ensure the wording is consistent with current conventions such as referring to the Australian Government instead of the Federal Government.

To assist in facilitating an efficient and effective debate, motions that cover similar matters will appear grouped together in the Business Papers and the matter will be debated only once with the lead or strategic motion being the one debated.

Motions that are agreed to at the NGA become Resolutions of the NGA. These Resolutions are then considered by the ALGA Board when setting national local government policy,

when the Board is making representations to the Federal Government at Ministerial Councils, during meetings and in ALGA publications. The ALGA Board is not bound by any Resolution passed at the NGA.

Motions are to be submitted online at www.alga.asn.au and should be received by **ALGA no later than 11.59pm Friday 22 April 2016**.

The following information will be required when you submit a motion using the online form.

Motion

- Text of the Motion

National Objective

- Why is this a national issue and why should this be debated at the NGA?
- Maximum 100 words

Summary of Key Arguments

- Background information
- Supporting arguments
- Maximum of 300 words (additional information should be provided as speaking notes to the council representative who will move the motion at the NGA)

Declaration

You will need to declare that the motion has been endorsed by your council.

ATTACHMENT 2

AUSTRALIAN LOCAL GOVERNMENT ASSOCIATION

National General Assembly of Local Government

19 - 22 June 2016

Call for Motions Discussion Paper

'Partners in an Innovative and Prosperous Future'

Motions should be lodged electronically at www.alga.asn.au no later than 11:59pm on Friday 22 April 2016.

Submitting Motions

The National General Assembly of Local Government is an important opportunity for you and your council to influence the national policy agenda.

To assist you and your council to identify motions that address the theme of the NGA, the ALGA Secretariat has prepared this short discussion paper. You are encouraged to read all of the sections of the Paper, but are not expected to respond to every question in each section. Your motion/s can address one or all of the issues identified in the discussion paper.

To be eligible for inclusion in the NGA Business Papers, and then debate on the floor of the NGA, motions must be consistent with the following principles:

1. be relevant to the work of local government nationally
2. be consistent with the themes of the Assembly
3. complement or build on the policy objectives of your state and territory local government association
4. propose a clear action and outcome, and
5. not be advanced on behalf of external third parties that may seek to use the NGA to apply pressure to Board members or to gain national political exposure for positions that are not directly relevant to the work of, or in the national interests of, local government.

Motions should generally be in a form that seeks the NGA's support for a particular action or policy change at the Federal level which will assist local governments to meet local community needs. For example: *That this National General Assembly call on the Federal Government to restore indexation to local government financial assistance grants.*

Motions should be lodged electronically using the online form available on the NGA Website at: www.alga.asn.au. All motions require, among other things, a contact officer, a clear national objective, a summary of the key arguments in support of the motion, and endorsement of your council. Motions should be received by ALGA no later than 11:59pm on Friday 22 April 2016, electronically in the prescribed format.

Please note that for every motion it is important to complete the background section on the form. Submitters of motions should not assume knowledge. The background section helps all delegates, including those with no previous knowledge of the issue, in their consideration of the motion.

All motions submitted will be reviewed by the ALGA Board's NGA Sub-Committee as well as by state and territory local government associations to determine their eligibility for inclusion in the NGA Business Papers. When reviewing motions, the sub-committee considers the importance and relevance of the issue to local government. Please note that motions should not be prescriptive in directing how the matter should be pursued. Motions may be edited before inclusion in the Business Papers to ensure consistency. If there are any questions about the substance or intent of a motion, ALGA will raise these this with the nominated contact officer. Any motion deemed to be primarily concerned with local or state issues will be referred to the relevant state or territory local government association, and will not be included in the Business Papers.

For more information, please contact Clare Hogan at ALGA on (02) 6122 9400.

Preamble

The 2016 National General Assembly (NGA) is most likely to be held in the lead up to the next Federal election. During this time, all national political parties focus on leadership, key messages, marginal seats and political campaigning. National policy initiatives enter the public domain and all Australians are asked to engage in the political process and choose between competing ideas, election promises and the numerous candidates across the nation.

Last year's NGA theme was *'Closest to the People - Local government in the Federation'*. The theme reinforced the vital role of local government in Australia's system of government. It built on the Government's Federation White Paper process, which sought to clarify roles and responsibilities of the levels of government and potentially better align funding with respective responsibilities. It also acknowledged the development of a Green Paper on Taxation. The NGA greatly assisted ALGA in its advocacy and participation in the reform process.

Since then there has been much debate on taxation reform, which will culminate at the 2016 Federal election.

In December 2015 the Council of Australian Governments (COAG) reset the national political dialogue. COAG committed to:

> '... close collaboration in areas of shared responsibility, including competition, tax, innovation, infrastructure, cities and regulation, as well as in health and education. '

COAG leaders agreed the principles for a new national economic reform agenda should be:

> '…to deliver for all Australians no matter where they live:
>
> - a stronger, more productive and more innovative Australian economy, with more jobs, more opportunities and higher living standards
> - fairness and equity, with protection for disadvantaged and lower income Australians, and
> - more efficient and high quality services.'

The theme of the 2016 NGA – *'Partners in an Innovative and Prosperous Future'* – invites councils from across Australia to consider the role of local government in this agenda, and how councils can play their role in the delivery of these objectives.

Many of the services and infrastructure provided by councils are not only critical to the social, cultural and environmental well-being of their communities, but also to the economic prosperity of their regions and the nation more broadly.

The NGA debate on motions and associated discussions will seek to highlight how local government can be more agile in delivering those services to communities, as well as send a strong and unified message to the Commonwealth.

Introduction

The 2016 NGA theme is *'Partners in an Innovative and Prosperous Future'*.

This year, the NGA debate on motions and associated discussions will seek to highlight how local government can be more efficient and effective. The discussions will look at how local government, working in partnership with other levels of government, the private sector and the not-for-profit sector, can innovate and create a prosperous future for the community it serves.

This year's theme builds on the work of the 2015 NGA which focused on local government's role in the Federation. The Commonwealth Federation Discussion Paper 2015 sets a context in which motions for this year's NGA should be developed.

The theme *'Partners in an Innovative and Prosperous Future'* seeks to focus attention on the role that local government can play in creating a prosperous Australia. The Federation Discussion Paper notes that Australia today is very different from the country it was at the time of Federation and poses the fundamental question: '... does [the Federation] provide the system of national governance that Australians need right now, and will it help or hinder efforts to adapt and thrive in the vastly different economic, political and social realities of the 21st century?'

To put this question in a local government context:

Are the government systems (including our own), processes and priorities, in many cases set up decades ago, still appropriate today?

Are they delivering accessible and fair systems and are they a help or hindrance? Do they facilitate business activity and contribute to higher living standards, or are they a drag on the local economy? Are they necessary or do they duplicate effort?

Technological change has created opportunities, making many traditional models of business and government obsolete. Have these opportunities be taken up?

Participatory democracy is being enhanced through empowering individuals and local communities with new knowledge and new ways of engaging with each other and with governments. Are these opportunities been captured?

Australian productivity and living standards are comparatively high by world standards. However, the current national productivity and reform debate recognises that without reform, Australia risks being left behind on the world stage—meaning fewer jobs, lower economic growth, and reduced living standards.

COAG has responded positively to this challenge. All governments have committed to collaborate particularly in areas of shared responsibility, including competition, tax, innovation, infrastructure, cities and regulation, as well as health and education.

The 2016 NGA seeks motions that suggest reform, innovation in government operations and opportunities to partner with local government that will support Australia's prosperity.

Local government role in national productivity

Over several decades, the NGA has called on the Australian Government to recognise the importance of greater levels of investment in local and regional infrastructure. This advocacy has been, in part, built on equity considerations as well as productivity considerations.

The NGA has called on the Australian Government to increase Financial Assistance Grants and Roads to Recovery (R2R) funding. These calls have been predominantly based on the need for the Commonwealth to help achieve horizontal equity (i.e. an equitable level of municipal services across the country) and the need to assist local councils to rebuild and maintain local infrastructure, particularly roads.

The rationale for permanent R2R funding and additional freight investment is that essentially the purpose of R2R is to restore the capacity of local roads to a standard able to sustain social and economic services, whereas additional funding through freight investment would be required to improve the standard of roads to meet the higher service levels required to handle higher productivity vehicles and significantly higher volumes of freight traffic.

The NGA's calls to the Australian Government have also sought recognition that local infrastructure provides important economic services. Local roads, for example, are an essential component of the national road network and therefore add to local and regional productivity and, in aggregate, make a significant contribution to state and national productivity.

Community infrastructure also plays an important role in local and regional economic development by enhancing the quality of life for residents as well as helping to attract and retain population, skilled workers and a local and regional workforce. The State of the Regions Report in 2015, commissioned by ALGA and written by National Economics, showed that there is a strong economic rationale for ensuring that all regions in Australia prosper. The report confirmed OECD findings that regional inequality reduces national productivity.

Local government's objectives in local economic development are diverse. They recognise local circumstances, availability of resources and the impact of external factors such as privatisation, technological change, globalisation and structural industry changes. For some councils, particularly in rural and regional areas, the focus is on stemming the decline in population, loss of businesses and local employment. For others, it is a focus on working with local businesses and the local community to optimise economic development and opportunities for the area.

Local government can facilitate and support economic development but it is frequently criticised for impeding economic development by imposing additional costs on business including through regulation, creating red-tape, providing unsuitable infrastructure etc.

Australian councils contribute significantly to the productivity and economy of their regions by focusing their efforts in three key strategic areas:

- creating and maintaining the investment environment – ensuring the availability of appropriate physical and social infrastructure, striving to deliver a quality public domain, and ensuring sufficient housing diversity and lobbying on behalf of local and regional communities for sufficient community services such as education and training, health and well-being, community safety and emergency services

- facilitating new local investment – actively promoting business development through facilitating local economic development, strategic planning, working with business

associations/main street organisations, and active involvement with tourism or other business activities, and

- attracting external investment through the creation of new business and capital – working with regional bodies such as RDA, Austrade and developers to attract and create new businesses and investment.

Local government has a key role to play in the provision of support services and infrastructure that underpins local and regional economic development, and therefore local government plays an essential part in achieving higher productivity. In broad terms, actions geared to creating and maintaining the investment environment in local and regional communities are considered to be of prime importance to a majority of local councils and it is this area that ALGA has focused its greatest attention.

Local government is a natural leader in local economic development because councils know their local business communities, workforce and comparative advantages better than anyone else. Local people and businesses are the key to economic growth and development and councils are perfectly positioned to work with local stakeholders to drive a bottom-up, place-based approach to achieve prosperity. Every council's economic development activity will be different according to the unique structures and needs of their local economies, as well as the capacity of the council and community.

Questions

Given the importance of local and regional infrastructure are there any national initiatives that could further assist local government to support local and regional productivity?

Are there areas of reform that local government can explore to enhance economic development and productivity?

Partnering

The term *partner* as a noun is defined as '... a person who takes part in an undertaking with another or others, especially in a business or firm with shared risks and profits.' In the context of the 2016 NGA, it can be interpreted as '.... how councils can take part in an undertaking with others, including sharing the risk, for the benefit of the community'.

Local government provides a vast array of services and local infrastructure, often in partnership with others including other governments, the private sector, the community and not-for-profit sector.

Example of partnerships include:

- the provision of a local swimming pool in partnership with the private sector, or a not-for-profit organisation, that provides the management service of that facility
- the provision of Meals on Wheels in partnership with the community not-for-profit sector delivering meals to residents at their homes, and
- the provision of Home and Community Care (HACC) to targeted groups of clients in the municipality, in partnership with the federal and state governments which provide funding.

Other examples include:

- councils partnering with a university to provide locally-relevant research to inform decisions on issues such as development applications in areas that could be effected by sea level change
- partnering with other councils to share resources and skills, and
- partnering with the private sector to develop new and innovative ways of delivering services, such as electronic planning or apps to report pot holes.

A key feature of each of these examples is that each party brings different expertise, skills, resources and experiences to the specific undertaking. The combination of these skills, expertise and resources frequently results in innovation and the provision of a service in a way that would not be possible by either party separately.

An alliance between local government and other partners creates new opportunities for business as well as innovative services, increased efficiency, cost savings and more accessible service to the benefit of the community.

Questions

Please note, where local government is mentioned in the following questions it refers to local government as a whole, not specific proposals for partnerships at a single council level. Questions are designed to draw out new ideas that could transform the delivery of services and infrastructure at a systemic level.

Are there new opportunities for the Australian Government to partner with local government to deliver Commonwealth services at the local level? What would be the role of the Commonwealth in such a partnership? How would this benefit the community?

Are there partnerships that could be developed to maximise the opportunities to innovate and provide simpler, smarter and more reliable services and infrastructure at the local level? If so, what are these opportunities and what would be the role of the Commonwealth in supporting these partnerships?

Are there opportunities for the private sector to partner with local government to speed up and improve a local government service or function? What role could the Commonwealth play in facilitating these opportunities?

Innovation

The Australian Government has declared its strong support for innovation. The Government's National Innovation and Science Agenda says innovation is:

> '... at the heart of a strong economy—from IT to healthcare, defence and transport—it keeps us competitive, at the cutting edge, creates jobs and maintains our high standard of living. It's not just about new ideas, products and business models; innovation is also about creating a culture where we embrace risk, move quickly to back good ideas and learn from mistakes.'

The statement has a focus on a range of objectives including:

- entrepreneurship and leveraging our public research
- increasing collaboration between industry and researchers to find solutions to real world problems and to create jobs and growth
- developing and attracting world-class talent for the jobs of the future, and
- government leading by example by embracing innovation and agility in the way we do business.

Questions

What is the role of local government in this innovation agenda?

Are these objectives relevant to local government itself? For example, is its role in increasing collaboration between industry and researchers to find solutions to real-world problems and to create jobs and growth? If so, how can these solutions be shared to the benefit of all councils and their communities. How could the Australian Government help this to occur?

What can local government bring to the table as a partner? For example, does local government hold data that, having regard to privacy issues, could be shared with the private sector which could put it to innovative uses? How could the Australian Government support this?

Are there digital innovations that could be introduced to local government that would increase the efficiency of businesses working with local government and vice-versa. How could the Australian Government support this?

Is there a role for local government to help innovative start-ups to rapidly transform their ideas into globally competitive businesses by giving them mentorship, funding, resources, knowledge and access to business networks? If so, how could the Australian Government support this?

Resourcing

In the 2014-15 Federal Budget, the Government committed to provide $2.2867 billion in Local Government Financial Assistance Grants (FAGs). However, the Government also announced it would pause the indexation of FAGs for the three years following that budget.

FAGs are a Commonwealth Specific Purpose Payment to local government paid through the State and Territory Governments. Payments are made to councils by jurisdictional Treasurers on the advice of state and territory Local Government Grants Commissions under the provisions of *the Local Government (Financial Assistance) Act 1995*.

The objects of the *Local Government (Financial Assistance) Act 1995* enable the Commonwealth Parliament to provide assistance to the states for the purposes of improving:

(a) the financial capacity of local governing bodies

(b) the capacity of local governing bodies to provide their residents with an equitable level of services

(c) the certainty of funding for local governing bodies

(d) the efficiency and effectiveness of local governing bodies, and

(e) the provision by local governing bodies of services to Aboriginal and Torres Strait Islander communities.

Freezing the indexation of FAG's will reduce Commonwealth expenditures (and grants to councils) by more than $925 million over the forward estimates. The freeze also means that the aggregate level of FAGs will be permanently reduced by almost 13 per cent, unless there is a future government decision to restore this base with a catch-up payment.

Councils are invited to submit motions to address this issue.

2. PROPERTY SERVICES

2.1 Lot 52 DP 1028174 Minto Walk (Request for Release of Easement for Support)

Reporting Officer

Manager Property Services

Attachments

Locality Plan (contained within this report)

Purpose

To seek Council approval to remove a beneficiary interest (easement for support) for walkway over land being Lot 52 DP 1028174 (corner Edward Edgar Street and Ben Lomond Road, Minto) which is currently owned by UrbanGrowth NSW (Landcom).

History

The subject lot was created as part of the original residential subdivision of the area (Lot 9 DP 730994) and was proposed to be dedicated to Council by Landcom along with two other parcels which were dedicated as public reserve. Lot 52 was not dedicated to Council as advice provided by Council to Landcom in 2003 was that dedication should be placed on hold in view of the One Minto Redevelopment Project.

The subject section of land provided northern access to an existing overpass on Ben Lomond Road. Council deferred the dedication of this Lot as it was required as access to the bridge. As the pedestrian overpass bridge over Ben Lomond Road was removed some years ago as part of the One Minto Redevelopment Project the land was no longer required to provide pedestrian access.

Landcom subsequently approached Council seeking to transfer the land Lot 52 DP 1028174 at nil cost to Council and a report was presented to Council at its meeting of 21 September 2010 recommending that Council accept the transfer for nil cost.

In subsequent dealings with Landcom it was advised that Council required that the rear and side boundaries be fenced by Landcom due to the steep fall at these boundaries prior to the land being transferred to Council.

Report

Landcom subsequently approached Council in 2014 advising that they were close to selling the parcel of land being Lot 52 DP 1028174 to the adjoining owner and requesting Council approval to release the easement for support which benefits Minto Walk.

The easement for support has been identified by Landcom as being an obsolete easement given that the pedestrian overhead bridge was removed.

Although the easement for support on title for Lot 9 DP 730994 from which Lot 52 DP 1028174 was created identified that the authority and power to release, vary or modify this interest was the Housing Commission of NSW, Council has been advised that Land and Property Information require Council approval to release this interest as Council is nominated as a party with a beneficial interest in the easement description.

The easement for support which Landcom are seeking Council to release has a variable width (approximately 123 metres long and 6 metres wide) with an area of approximately 738 square metres, which traverses Lot 52 DP 1028174 having an area of 1,560 square metres.

A response was provided to Landcom that it was Council's standard procedure to charge an administration fee and seek payment of compensation for the removal/release of any interest on title and that a report to Council was required with a resolution in support of the recommendation.

UrbanGrowth NSW have requested that Council waive its administration fee and compensation for release of the easement on the basis that the alternative would be that UrbanGrowth would transfer the land to Council which would create a continuous maintenance liability to Council.

It is advised that the subject land is zoned 2(b) Residential under Council LEP 2002 and under CLEP 2015 the land is to be zoned R3 Medium Density Residential.

Officer's Recommendation

1. That Council provide approval to waive its standard procedure to seek an administration fee and compensation fee for the release of easement for support (walkway) from the title of Lot 52 DP 1028174.

2. That all documentation associated with the release of easement for support be executed under the Common Seal of Council if required.

Committee's Recommendation: **(Hawker/Mead)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Mead/Lake)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

That the Officer's Recommendation be adopted.

ATTACHMENT 1

3. FINANCIAL SERVICES

3.1 Rescinded Revenue Pricing Policy

Reporting Officer

Manager Financial Services

Attachments

Revenue Pricing Policy (contained within this report)

Purpose

To obtain Council approval to rescind the Revenue Pricing Policy that is not required as it is disclosed in Council's Operational Plan.

History

The abovementioned policy was adopted by Council on 19 June 2012. The policy is now due for review in accordance with Council's Records and Document Management Policy.

Report

The abovementioned policy is proposed to be rescinded in accordance with Council's Record Management Policy and the adopted procedure for Policy Development and Review.

The Revenue Pricing Policy currently forms part of the Operational Plan which is adopted by Council once a year as part of the budget process.

Officer's Recommendation

That the Revenue Pricing Policy be rescinded.

Committee's Recommendation: **(Lake/Kolkman)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Mead/Lake)**

That the Officer's Recommendation be adopted.

Council Minute Resolution Number 34

That the Officer's Recommendation be adopted.

ATTACHMENT 1

campbelltown city council	**POLICY**

Policy Title	Revenue Pricing
Related Documentation	Operational Plan Fees and Charges
Relevant Legislation/ Corporate Plan	Local Government Act
Responsible Officer	Manager Financial Services

Policy details may change prior to review date due to legislative changes, therefore this document is uncontrolled when printed.

Statement

A Council must have an Operational Plan that is adopted before the beginning of each year. The Plan is to detail the activities to be engaged in by the Council during the year as part of the delivery program covering that year.

The Operational Plan must include a statement of Council's Revenue Policy for the year covered by the Operational Plan. The statement of revenue policy must include the statements and particulars require by the regulations.

A copy of the Revenue Pricing Policy can be found in the Operational Plan detailed on Council's website at:

Council - Administration - Financial Information - Related Links - Operational Plan

END OF POLICY STATEMENT

3.2 Revised Accounting Practices Policy

Reporting Officer

Manager Financial Services

Attachments

Revised Accounting Practices Policy (contained within this report)

Purpose

To seek Council's endorsement of the revised Accounting Practices Policy.

History

The abovementioned policy was adopted by Council on 15 July 2003 and was reviewed on 16 October 2012. The policy is now due for review in accordance with the Record Management Policy.

Report

The abovementioned policy has been developed in accordance with Council's Record Management Policy and the adopted procedure for Policy Development and Review.

The Accounting Practices Policy has been reviewed and found minor changes are required to update the terminology from Balance Sheet to Statement of Financial Position and to amend a typographical error under Principles. Both changes are highlighted in the attachment. It is recommended that the policy be adopted and a new review date identified.

Officer's Recommendation

1. That the revised Accounting Practices Policy as attached to this report be adopted.

2. That the Policy review date be set at 30 March 2018.

Committee's Recommendation: **(Kolkman/Lake)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Mead/Lake)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

That the Officer's Recommendation be adopted.

ATTACHMENT 1

campbelltown city council	**POLICY**
Policy Title	Accounting Practices
Related Documentation	Significant Accounting Policy
Relevant Legislation	*Local Government Act 1993* The Australian Accounting Standards Board Local Government Code of Accounting Practices and Financial Reporting *Local Government (General) Regulations 2005*
Responsible Officer	Manager Financial Services

Policy details may change prior to review date due to legislative changes, therefore this document is uncontrolled when printed.

Objectives

The purpose of this policy is to document the accounting practices by Campbelltown City Council. These accounting practices are in addition to the 'significant accounting policies' listed in the annual financial statements and refer to matters which are of less significance or considered immaterial.

Policy Statement

This policy has been developed in conjunction with Council's external Auditor to develop a process for the dealing of various transactions affecting Council's end of year financial position. The policy has been developed taking into account all relevant legislation.

Scope
The scope of this policy is to formalise the accounting treatment for transactions affecting Council's end of year financial position.

Definitions
Contingent Asset - is recognised in the Notes to the end of year financial reports. This is reliant on a set of events and does not affect the Income Statement or the Statement of Financial Position as presented in Council's end of year financial reports.

Immaterial - relates to the quantum of the amount of a transaction and where this amount is of a minor nature, it is considered to be immaterial.

Legislative Context
This policy is in accordance with the *Local Government Act 1993*, *the Local Government (General) Regulations 2005*, the Local Government Code of Accounting Practice and Financial Reporting and the Accounting Standards as released by the Australian Accounting Standards Board.

Principles

Childcare Income, Childcare Fees in advance and Childcare Debtors

Council's policy is to only recognise childcare income on a cash basis. The extent of any childcare fees in advance or childcare debtors is considered immaterial and the cost of gathering the information on a monthly basis is prohibitive.

The recoverability of childcare debtors is also considered doubtful so any debtors would need to be provided for by way of a doubtful debts provision liability.

Library Fines

Library fines are brought to account as income on a cash received basis. Outstanding fines are accrued as a debtor with an offsetting provision to enable Council to monitor the balance. The Library system is used as the subsidiary ledger. Due to the minor nature and likelihood recoverability, no contingent asset is recognised.

Prepayments

Although Council prepares its accounts on an accrual basis, prepayments will only be recognised if the prepayment exceeds $1,000 per month.

Issues such as prepaid motor vehicle registration or telephone services in advance are considered immaterial and not recorded as prepayments.

Income In Advance

Although Council prepares its accounts on an accruals basis, income in advance will only be recognised if the advance exceeds $1,000 per month.

Specific issues such as prepaid childcare fees or leisure centre membership fees are considered immaterial and not recorded as income in advance.

Stock on Hand

Stock on hand at Council's Central Store is accounted for by the Council's Inventory Module within the Financial Management Information System and an annual stocktake is performed to reconcile the physical stock to the expected stock levels.

Other stock owned by Council such as stationery, kiosk supplies and clothing and equipment at leisure centres is expensed when purchased and not recorded as an asset of the Council.

Parking Fines

Fines are referred to the Infringement Processing Bureau for monitoring and recovery. The Infringement Processing Bureau maintains the controls and checks to monitor outstanding fines. Fines are subject to appeal and negotiation. Therefore it is Council's policy only to recognise the income on a cash received basis.

Additionally, Council also chooses not to recognise these debtors as a contingent asset as Council has no control over the recovery process.

Section 94

Section 94 Contributions are brought to account on a cash received basis. This accounting approach is consistent with the funding of Section 94 works, ie: the funds are received before the works can commence.

Although a contingent asset exists, this asset is matched with an obligation of Council to perform tasks documented in the Section 94 plan. Therefore, no contingent asset or liability is recognised in the accounts in relation to Section 94.

Developer Contributions

Developer contributions are brought to account as soon as Council has a legal claim to the contribution. The allocation of the subsequent receivable between current and non-current will be determined by the conditions of the approval where an agreement is executed.

Responsibility

The Manager Financial Services shall ensure that all transactions are treated in accordance with this policy at the end of each financial year and reflected consistently in Council's end of year financial reports.

Effectiveness of this Policy

This policy will be reviewed on a three year basis or where alterations in legislation will require a review of the treatment of transaction associated within this policy.

END OF POLICY STATEMENT

3.3 Revised Investment Policy

Reporting Officer

Manager Financial Services

Attachments

Revised Investment Policy (contained within this report)

Purpose

To seek Council's endorsement of the revised Investment Policy.

History

The abovementioned policy was adopted by Council on 3 August 1984 and was reviewed on 21 April 2015. The policy is now due for review in accordance with the Record Management Policy.

Report

The abovementioned policy has been developed in accordance with Council's Record Management Policy and the adopted procedure for Policy Development and Review.

Council's external financial advisors, Spectra Financial Services were consulted and have advised that, in their view, the policy is consistent with the conservative approach required for the stewardship of the restricted and unrestricted reserve monies Council is responsible for.

The Investment Policy has been reviewed and found that no changes were required. It is recommended that the policy be adopted and a new review date identified.

Officer's Recommendation

1. That the revised Investment Policy as attached to this report be adopted.

2. That the Policy review date be set at 30 March 2018.

Committee's Recommendation: **(Lake/Kolkman)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Mead/Lake)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

That the Officer's Recommendation be adopted.

ATTACHMENT 1

campbelltown city council	**POLICY**
Policy Title	Investment Policy
Related Documentation	Accounting Practices Statement
Relevant Legislation/ Corporate Plan	*Local Government Act 1993* *Local Government General Regulation 2005* Ministerial Investment Order Local Government Code of Accounting Practice and Financial Reporting Australian Accounting Standards Division of Local Government Circulars
Responsible Officer	Manager Financial Services

Policy details may change prior to review date due to legislative changes, therefore this document is uncontrolled when printed.

Objectives

To maximise earnings through a diversified portfolio invested in approved investments that recognise Council's planning and cash flow forecasts.

To minimise the risk of loss of principal through a policy based on high credit levels (counterparty risk) and diversification.

To seek to ensure earnings are positive over the life of the investment.

To minimise the risk of loss (both principal and interest) through clear management procedures and investment discretions.

To provide a planning framework for ongoing monitoring and review of Council's investments and its policy.

To consider investment management in the wider context of Treasury Risk Management.

Policy Statement

Interest on these investments represents a significant contribution to the total income of Council and it is essential that Council has clear policy guidelines as to how funds can be invested. While the *Local Government Act 1993* – Order (relating to investments by Councils) is quite explicit as to the types of institutions with which Council can invest, there are nevertheless variations in the financial ratings of these institutions and the types of investments that can be purchased, which are not explained. This policy aims to clearly state the institutions with which Council can invest the maximum proportion of funds that may be placed with individual organisations and the types of investments entered into.

Scope

This policy applies to Investment monies built up through:

- General unrestricted reserves created through rate income and other revenue sources exceeding (re)current expenditure, sale of properties and other assets
- Restricted reserves that accrue through contributions under Section 94 of the *EPA Act*
- Internally restricted reserves
- Restricted reserves accruing through special purpose grants, donations etc
- Loan proceeds drawn down awaiting expenditure
- Timing differences within the year between rate receipts and expenditures.

Definitions

Working Funds	Maturities up to 180 days
Contingent Reserves	Maturities 6 months to 24 months
Core Holdings	Maturities beyond 24 months.

Legislative Context
Council's power to invest is derived from Section 625 of the *Local Government Act 1993*, as amended by the *Statute Law (Miscellaneous Provisions) Act 2000* – which limits investments to only those that the Minister approves.

The Local Government Act
Section 625 (2) of the Act provides that:

"Money may be invested only in a form of investment notified by order of the Minister published in the Gazette".

Investments previously authorised under the *Trustee Act* are no longer available to Council.

The current Ministerial order – 12 January 2011.

Principles

Authority for Investment
Investment of Council funds is limited to those allowed by the most current Ministerial Investment Order that has been issued by the NSW Minister for Local Government in accordance with the following guidelines:

Guidelines

a) Authorised Investments
   i) Public funds or securities issued by or guaranteed by the Commonwealth, State of the Commonwealth or a Territory
   ii) Debentures or securities issued by a Council (within the meaning of the *Local Government Act 1993* (NSW)
   iii) Interest bearing deposits with, or any debentures or bonds issued by, an authorised deposit taking institutions (as defined by the *Banking Act 1959 (Cwlth)*), but excluding subordinated debt obligations
   iv) Bills of exchange which have maturity dates of not more than 200 days; and if purchased for value confers on the holder in due course the right of recourse against a bank which has been designated as an authorised deposit taking institution by the Australian Prudential Regulation Authority (APRA)
   v) Deposits with the New South Wales Treasury Corporation or investments in an Hour-Glass investment facility of the New South Wales Treasury Corporation.

All investment instruments (excluding short term discount instruments) referred to above include both principal and investment income.

b) Council's Own Direct Investments
   Council's policy is to only invest with the four major tier one Australian trading banks and their subsidiaries, as well as other tier two publicly listed Australian banks, in term deposits and senior debt instruments in accordance with the Ministerial order.

   Investments in other tier two Australian banks are not to exceed twelve months in duration, be limited to 5% of the portfolio per institution to a maximum of 20% of the portfolio for this group and each institution must have a short term Standard & Poor's rating of not less than A-1 or A-2.

Council may take the opportunity to allocate core funds in longer term investments such as floating rate notes and fixed rate bank bonds. This will depend on the interest rate outlook and be based on Council's cash flow forecast and the need to hold contingent reserves.

Short Term Rating (0-365 days) means the institution's capacity to repay debt in the short term. Example of short term paper are:
i) Commercial Bills
ii) Certificate of Deposits
iii) Term Deposits
iv) Bill Lines and
v) 11am Deposits etc.

The Short Term Rating Order (as defined by S&P Australian Ratings) is:
A1+ extremely strong degree of safety regarding timely payment
A1 a strong degree of safety
A2 a satisfactory capacity for timely payment

Long Term Paper is usually Bonds, Government and Semi-Government Securities etc. The rating order is:
AAA } an extremely strong capacity to repay debt
AAA- }

AA+ }
to } a very strong capacity to repay debt
AA- }

A+ }
to } a strong capacity to repay debt
A- }

BBB+}
to } an adequate capacity to repay debt
BBB- }

Quotations on Investments
Not less than three quotations shall be obtained from authorised institutions whenever an investment is proposed. The best quote on the day will be successful after allowing for administrative and banking costs, as well as having regard to the limits set above.

General Policy Guidelines

Diversification

Diversification is used to spread risk through utilisation of maximum percentage investment limits to the following:

- Individual Institutions (varies per credit rating)
- Credit Rating Bands (eg, AAA v A) - these are Standard & Poors Long Term ratings (or Moody's or Fitch equivalents).

These limits are as per the following schedule:

Credit Rating of Institution (Standard & Poors)	Maximum % of Total Investments	Maximum % with one Institution	Maximum Term
AAA An extremely strong capacity to pay	100%	45%	5 yrs
AA+, AA, AA- A very strong capacity to pay	100%	45%	5 yrs
A+, A, A- A strong capacity to pay	60%	20%	1 yr
Standard & Poor's Short Term Rating A-1 strong capacity to pay A-2 satisfactory capacity to pay	20%	5%	1 yr

Authorised Investments

Major trading banks (MTB's) refer only to ANZ Banking Group Ltd, Commonwealth Bank of Australia, National Australia Bank and Westpac Banking Corporation.

Wholly-owned bank subsidiaries of MTB's refer to Bankwest (CBA) and St George Bank (Westpac). Both bank subsidiaries carry the same short and long term credit ratings as their parent (A1+ / AA) but neither is guaranteed by their parent.

Other ADI's refer to those intermediaries listed at any time on APRA's website, http://www.apra.gov.au/adi/pages/adilist.aspx. Listed Australian banking entities include Bank of Queensland, Suncorp Metway, Bendigo and Adelaide Bank and Macquarie Bank.

Maturities

Working funds representing Council's liquidity requirements are managed so as to minimise the use of expensive overdraft to meet Council's day to day trading needs. An amount of at least $3m or 5% of the value of the total investment portfolio must be accessible within seven days.

Funds may be invested for a period up to five years. Investments exceeding a term of 12 months will only be placed with tier one institutions or wholly owned subsidiaries thereof, provided the institution is authorised under the current Ministerial Investment Order, and the subsidiary's rating from Standard and Poors, Moody's or Fitch is at least equivalent to it's parent tier one institution rating.

The maturity allocation of core funds, and whether fixed or floating rates, will be determined by the interest rate outlook and be apportioned based on Council's cash flow forecast in conjunction with Council's Financial Advisor, Spectra Financial Services.

Independent Financial Advice

New Investment instruments that are promoted by an appropriately rated Financial Institution must be the subject of a review by Council's independent financial advisor. Funds may not be placed in any new financial product before this review has been completed.

Review of Investment Portfolio Performance
Council is presented with a monthly report on the performance of each fund/product that makes up Council's Investment portfolio. In conjunction with Spectra Financial Services, the Investment Policy will be reviewed at least annually or as required in the event of legislative changes.

Benchmarks

Cash	Reserve Bank Cash Reference Rate
Direct Investments	Bloomberg 90 Day Bank Bill Index

Responsibility
Manager Financial Services, Finance & Tax Accountant, and other authorised signatories.

Effectiveness of this Policy
This policy will be reviewed annually in accordance with Regulations and Departmental Guidelines to ensure its continuing suitability and effectiveness. Records of reviews shall be maintained.

END OF POLICY STATEMENT

3.4 Sundry Debtors Report - January 2016

Reporting Officer

Manager Financial Services

Attachments

1. Debtors summary to 31 January 2016 (contained within this report)
2. Ageing of sundry debts to 31 January 2016 (contained within this report)

Purpose

To provide a report detailing the amount outstanding by type and age for sundry and miscellaneous debts for the period ending 31 January 2016.

Report

Debts outstanding to Council as at 31 January 2016 are $2,119,277 reflecting an increase of $5,005 since December 2015. The ratio of outstanding debts to current invoices has increased from 11.3% in December to the current level of 14%. This debtor management ratio is a measure of the effectiveness of recovery efforts, however is impacted by Council policies as well as economic and social conditions.

Invoices raised – January 2016

During the month, 1086 invoices were raised totalling $1,772,362. The majority of these are paid within a 30 day period. The most significant invoices raised during the month have been in the following areas:

Government and other Grant -$1,303,293 – The main invoices relate to:

Roads & Maritime Services - WBS Project - Eagle Vale Drive	$1,056,547 (paid)
Department of Infrastructure and Regional Development – Lynwood Park Artificial Turf Upgrade - second payment	$150,000 (paid)
NSW Department of Justice - Rosemeadow Sports Complex, floodlight and fencing upgrade - second payment	$66,000 (paid)
Greater Sydney Local Land Services - mitigating key threats to Campbelltown Koalas	$27,362 (paid)

Land and Building Rentals – $125,681 – the main invoices relate to:

Aldi Foods Pty Ltd - monthly rental Macquarie Fields	$25,214
Caltex Oil Australia Pty Ltd – monthly rental Macquarie Fields	$15,974
Mycorp Group Pty Ltd - monthly rental Macquarie Fields	$13,878

Sundry – $95,111 – The main invoices relate to:

Joyland Amusements Pty Ltd - Fisher's Ghost 2015 - Commission payment	$89,514 (paid)

Sportsground and Field Hire – $54,003 – the main invoices relate to:

Campbelltown UWS Collegians Athletics - Hire of Campbelltown Athletics Centre	$13,844 (paid)

Pool Hire - $29,703– the main invoices relate to:

Swimming NSW – Learn to Swim Program	$8,705
Mary Immaculate Parish Primary School - Learn to Swim Program	$9,030
Good Shepherd Primary School – Learn to Swim Program	$11,230

Receipts to the value of $1,767,357 have been received during the period, the most notable in the following areas:

Government and other Grants	$1,210,020
Road and Restorations	$121,554
Waste Services	$112,053
Land and Building Rentals	$107,858
Sports Ground and Field Hire	$40,835

Sundry debts outstanding – 31 January 2016

Debts exceeding 90 days of age totalled $214,051 as at 31 January 2016. The major invoices relating to this balance include:

Description	**Date Invoiced**	**Balance at 31 January 2016**
Debtor 10068316.8 - retaining wall between Lot 1451 DP 703487, 2 and 4 Brownlow Place, Ambarvale. Debtor is maintaining arrangement to pay $450 per month as approved by Council	09/06/10	$4,700
Casper's Baseball Club - electricity charges. Club is experiencing financial difficulty, however have been making irregular payments to reduce the debt. Council continues to communicate with club and Macarthur Baseball to resolve debt	17/12/12 to 17/06/15	$6,946
Insight Mercantile Pty Ltd - abandoned motor vehicle, unable to locate owner of the vehicle. Vehicle held at auction house preparing for sale. Auction house is obtaining legal advice in regard to encumbrance laws delaying sale of vehicles	18/07/14	$2,799
GE Automotive - abandoned motor vehicle, unable to locate owner of the vehicle. Vehicle held at auction house preparing for sale. Auction house is obtaining legal advice in regard to encumbrance laws delaying sale of vehicles	05/07/12	$5,709

Debtor 10074366.5 - motor vehicle accident at the Animal Care Facility. Insurance company has agreed to pay debt and legal costs. Paid 5 February 2016	05/06/14	$1,981 (paid)
Master Woodturning - land value associated with walkway closure adjoining 37 Lancaster Street, Ingleburn. Funds in trust to be released early March	20/11/14	$54,129
Bastow Civil Constructions - road restoration - various locations The Parkway, Bradbury, sent to Council's debt recovery agents. No contact made from debtor - Statement of claim has been issued	19/08/15	$13,058
Campbelltown City Kangaroos RLFC – various invoices relating to hire of Campbelltown Football Stadium, field hire and electricity charges. Seven day letter has been issued and contact made with the club who advised that payment would be made, expected end of January 2016. Part payment made, balance to be paid end February 2016	30/08/15	$1,725
Debtor 10074441.6 – child care fees – contact made with Family and Community Services, change of office and caseworker has delayed payment but is expected to be finalised by end of January 2016	07/05/15	$1,826
Debtor 10075795.4 – road restoration - 13 Bensbach Road, Glenfield. Paid 18 February 2016	31/07/15	$2,600 (paid)
Debtor 10073212.2 – shop licence inspection fees and legal recovery costs, examination order filed by Council's debt recovery agents. Attended court and arrangement made by debtor $200 per fortnight. Defaulted on arrangement, bank garnishee ordered December 2015. Account closed with financial institution, awaiting instructions from Council's debt recovery agents	24/09/13	$3,042
Networx Constructions - road restoration - Hurley and Patrick Streets, Campbelltown	16/10/15	$8,942 (paid)
Crown Resorts Foundation - WS Arts Funding Initiative - Campbelltown Arts Centre School Education Program 2016	02/11/15	$55,000 (paid)
Decadance Dance Studio - Permanent hall hirer of Ron Moore Community Centre, hire has been cancelled due to defaulting agreement and 7 day letter issued February 2016, awaiting response	03/11/15	$2,971

Debt recovery action is undertaken in accordance with Council's Sundry Debtors Recovery Procedures Policy and commences with the issue of a tax invoice. A person or entity may be issued any number of invoices during the calendar month for any business, services or activities provided by Council. At the conclusion of each calendar month, a statement of transactions is provided with details of all invoices due and how payments or credit notes have been apportioned. Once an invoice is paid, it no longer appears on any subsequent statement.

All debts that age by 90 days or more are charged a statement administration fee of $5.50 per statement. Debtors are contacted by telephone, email or in writing to make suitable arrangements for payment of the overdue debt. Where a suitable arrangement is not achieved or not maintained as agreed, a seven day letter is issued referencing referral to Council's debt recovery agents.

Matters referred to Council's recovery agent are conducted in accordance with relevant legislation and the *Civil Procedures Act 2001*. Formal legal recovery commences with a letter of demand (or letter of intent) providing debtors with at least 14 days to respond. In the event that no response is received, instructions are given to proceed to Statement of Claim allowing a further 28 days to pay or defend the action. Failing this, the matter will automatically proceed to judgment and continue through the *Civil Procedures Act 2001* process.

All costs associated with formal legal recovery are payable by the debtor and staff continue to make every effort to assist debtors to resolve their outstanding debt before escalating it through the local court.

During the month 13 accounts were issued a letter of demand on Council's letterhead, advising that if the account was not settled or an appropriate arrangement was not made, the account will escalate to formal legal action through Council's agent.

Council's agents were instructed to issue one letter of demand for unpaid road restoration work.

Council officers continue to provide assistance to debtors experiencing difficulties in paying their accounts. Debtors are encouraged to clear their outstanding debts through regular payments where possible, to avoid any further recovery action.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: **(Lake/Mead)**

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 **(Mead/Lake)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

That the Officer's Recommendation be adopted.

ATTACHMENT 1

DEBTORS SUMMARY 1 January 2016 to 31 January 2016

DEBTOR TYPE/DESCRIPTION	ARREARS AT 31/12/2015	RAISED THIS PERIOD	RECEIVED THIS PERIOD	BALANCE AT 31/01/2016	% DEBT RATIO
Corporate Administration	50,128	24,242	22,424	51,946	29.49%
Abandoned Items	6,662	0	0	6,662	0.35%
Education and Care Services	18,710	13,852	1,804	30,759	0.98%
Community Bus	89	360	0	449	0.01%
Sportsground and Field Hire	30,913	54,003	40,835	44,081	5.46%
Government and other Grants	1,450,488	1,303,293	1,210,020	1,543,761	12.87%
Public Hall Hire	22,354	15,083	13,643	23,794	1.39%
Health Services	350	0	0	350	0.02%
Land and Building Rentals	59,675	125,681	107,858	77,498	5.63%
Healthy Lifestyles	8,934	36,751	30,658	15,028	0.15%
Library Fines and Costs	0	0	0	0	0.00%
Licence Fees	42,175	3,030	15,108	30,098	1.85%
Pool Hire	60,705	29,703	11,891	78,517	0.39%
Private Works	8,984	0	900	8,084	0.52%
Road and Footpath Restoration	152,943	1,412	121,554	32,801	28.17%
Shop and Office Rentals	19,206	42,113	38,231	23,088	2.17%
Various Sundry Items	135,955	95,465	40,379	191,041	6.42%
Waste Collection Services	84,678	27,375	112,053	0	6.17%
	1,501,854	**1,772,362**	**1,767,357**	**2,119,277**	**100%**

ATTACHMENT 2

AGEING OF SUNDRY DEBTOR ACCOUNTS - 31 January 2016

Description	Current Charges	Total 30 Days	Total 60 Days	Total 90+ Days	Balance Due	*Previous Month 90+ days*
Corporate Administration	13,818	13,761	9,494	14,872	51,946	*14,032*
Abandoned Items	0	0	0	6,662	6,662	*6,662*
Education and Care Services	30,759	0	0	0	30,759	*0*
Community Bus	449	0	0	0	449	*0*
Sportsground and Field Hire	23,097	9,501	144	11,340	44,081	*10,568*
Government and other Grants	1,303,293	150,000	55,000	35,468	1,543,761	*35,468*
Public Hall Hire	9,914	6,200	4,460	3,219	23,794	*3,071*
Health Services	0	0	0	350	350	*350*
Land and Building Rentals	58,725	17,708	1,064	0	77,498	*0*
Healthy Lifestyles	8,253	6,219	364	191	15,028	*790*
Licence Fees	1,535	6,025	2,366	20,172	30,098	*18,126*
Pool Hire	29,703	46,941	452	1,421	78,517	*895*
Private Works	0	0	0	8,084	8,084	*7,795*
Road and Footpath Restoration	1,316	0	5,205	26,280	32,801	*17,338*
Shop and Office Rentals	15,046	4,281	3,761	0	23,088	*0*
Various Sundry Items	95,112	8,914	1,023	85,992	191,041	*79,401*
Waste Collection Services	0	0	0	0	0	*0*
	1,552,342	**269,550**	**83,334**	**214,051**	**2,119,277**	*193,784*

3.5 Monthly Rates Summary

Reporting Officer

Manager Financial Services

Attachments

1. Monthly rate summary (contained within this report)
2. Actual to budget result (contained within this report)
3. Rates statistics (contained within this report)

Purpose

This report details the Rates and Charges levy and monthly cash collections result as at 31 January 2016.

Report

Rates and Charges levied to the end of January 2016 were $97,260,711, representing 100% of the budget estimate.

Rates and Charges collected to the end of January totalled $57,288,970. In percentage terms this amount represents 57.7% of all rates and charges due to be paid. In comparison, the amount collected in the same period last year was 57.4%.

The February rate instalment notices were issued on 15 January 2016 to 48,251 ratepayers. This represents a decrease of 519 on the number issued for the same period last year. Ratepayers continue to be encouraged to register to receive their annual and instalment notices via email with 1,685 registered for eRates.

Debt recovery action during the month involved the issue of 262 Statements of Claim to ratepayers who had either failed to maintain arrangements or had not responded to previous correspondence. In addition, 14 Writs were served on ratepayers who failed to respond to the Statement of Claim.

Ratepayers who purchased property since the issuing of the February instalment notices are issued a 'Notice to new owner' letter. This letter advises ratepayers of the annual amount levied and any balance unpaid since settlement occurred. During the month, 47 of these notices were sent to ratepayers.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: (Lake/Mead)

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 (Mead/Lake)

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

That the Officer's Recommendation be adopted.

RATES SUMMARY

STATEMENT OF ALL OUTSTANDING RATES AND EXTRA CHARGES

RATE - CHARGE	NET ARREARS 1/7/2015	NET LEVY FOR YEAR	PENSION REBATES	EXTRA CHARGES	TOTAL RECEIVABLE	CASH COLLECTED	NET AMOUNT DUE	POSTPONED RATES & INTEREST	GROSS AMOUNT DUE
RESIDENTIAL	2,443,224.65	54,430,506.63	1,413,309.12	527,108.26	55,987,530.42	31,897,601.73	24,089,928.69	308,181.59	24,398,109.91
BUSINESS	436,057.49	17,753,686.06		57,078.07	18,246,821.62	10,809,876.75	7,436,944.87		7,436,944.87
BUSINESS - IND	100.30	0.00		0.00	100.30	0.00	100.30		100.30
FARMLAND	0.00	597,545.27	884.79	2,726.10	599,386.58	249,295.38	350,091.20	147,727.43	497,818.63
MINING	0.00	23,937.48		0.00	23,937.48	23,937.48	0.00		0.00
LOAN	75,640.51	2,659.96		1,494.47	79,794.94	9,699.94	70,095.00	27,052.36	97,147.36
INFRASTRUCTURE	206,769.81	5,682,024.66		7,059.34	5,895,853.81	3,356,781.58	2,539,072.23	17,131.00	2,556,203.23
F5 ACCESS RAMPS	379.22	0.00		0.00	379.22	0.00	379.22		379.22
TOTAL	$3,142,670.23	$78,490,360.06	$1,414,193.91	$595,466.24	$80,833,804.37	$46,347,192.86	$34,486,611.51	$500,092.38	$34,986,703.52
GARBAGE	674,774.34	18,308,466.74	833,181.73	24,464.83	18,174,524.18	10,314,541.34	7,859,982.84		7,859,982.84
STORMWATER	49,776.92	1,041,949.95		334.10	1,092,060.97	627,236.30	464,824.67		464,824.67
GRAND TOTAL	$3,867,221.49	$97,840,776.75	$2,247,375.64	$620,265.17	############	$57,288,970.50	$42,811,419.02	$500,092.38	$43,311,511.03

Total from Rates Financial Transaction Summary	42,824,329.92
Overpayments	-487,181.11
Difference	0.00

ANALYSIS OF RECOVERY ACTION

Rate accounts greater than 6 months less than 12 months in arrears	740,542.82
Rate accounts greater than 12 months less than 18 months in arrears	124,978.49
Rate accounts greater than 18 months in arrears	25,821.73
TOTAL rates and charges under instruction with Council's agents	$891,343.04

ATTACHMENT 2

COMPARISON OF BUDGET TO ACTUAL

DESCRIPTION	ORIGINAL BUDGET	REVISED BUDGET	ACTUAL	BALANCE STILL REQD.	% RAISED
RESIDENTIAL	53,878,600	54,278,600	54,430,507	(151,907)	100.28%
BUSINESS	17,935,000	17,585,000	17,753,686	(168,686)	100.96%
FARMLAND	459,900	609,900	617,047	(7,147)	101.17%
MINING	23,900	23,900	23,937	(37)	100.16%
INFRASTRUCTURE	5,631,700	5,631,700	5,682,025	(50,325)	100.89%
SUB TOTAL	77,929,100	78,129,100	78,507,202	(378,102)	100.48%
INTEREST CHARGES	238,000	238,000	155,608	82,392	65.38%
LEGAL COSTS RECOVERED	840,000	840,000	464,658	375,342	55.32%
PENSIONERS - Sec 575	(1,837,700)	(1,837,700)	(1,873,096)	35,396	101.93%
PENSIONERS - Sec 582	(389,800)	(389,800)	(374,280)	(15,520)	0.00%
PENSIONERS SUBSIDY	1,010,735	1,010,735	1,030,203	(19,468)	101.93%
SUB TOTAL	(138,765)	(138,765)	(596,908)	458,143	430.16%
DOMESTIC WASTE CHARGES	17,621,100	17,621,100	17,783,989	(162,889)	100.92%
COMMERCIAL WASTE CHARGES	444,600	444,600	524,477	(79,877)	117.97%
STORMWATER MNGMNT	1,138,000	1,138,000	1,041,950	96,050	91.56%
SUB TOTAL	19,203,700	19,203,700	19,350,417	(146,717)	100.76%
GRAND TOTALS	96,994,035	97,194,035	97,260,711	(66,676)	100.07%

COLLECTIONS AS A % OF:	TOTAL RECEIVABLE	TOTAL LEVIED
RESIDENTIAL	56.97%	58.60%
BUSINESS	59.24%	60.89%
FARMLAND	41.59%	41.72%
INFRASTRUCTURE	56.93%	59.08%
ALL RATES	57.34%	59.05%

	TOTAL RECEIVABLE	TOTAL LEVIED
RATES	57.34%	59.05%
WASTE	56.75%	56.34%
STORMWATER	57.44%	60.20%
TOTAL RATES & CHARGES	57.72%	59.05%

ATTACHMENT 3

RATES STATISTICS

No. of documents Issued	July	August	September	October	November	December	January	February	March	April	May	June	Jan-15
Rate Notices	50,454	56		121			16						165
Electronic - DoH	5,427												
Instalment Notices				43,741			42,834						42,533
Electronic - DoH				5,389			5,417						6,237
Missed Instalment Notices			8,315			7,866							
- Pensioners > $15.00			586			554							
Notice to new owner	105	51	41	21	56	49	47						51
7-day Letters - Council issued			2,073			2,023							
- Pensioners > $500.00			170			181							
7-day Letters - Agent Issued			581				633						553
Statement of Claim	209	29	13	220	18	11	262						229
Judgments	16	40	19	12	64	3	11						18
Writs	11	29	17	9	11	18	14						17
eRates	1,543	1,601	1,611	1,640	1,654	1,660	1,685						1,367
Arrangements	351	298	373	396	471	355	402						381

3.6 Investment report - January 2016

Reporting Officer

Manager Financial Services

Attachments

1. Investment portfolio performance for the month of January 2016 (contained within this report)
2. Investment portfolio comparison between Councils (contained within this report)

Purpose

To provide a report outlining Council's investment portfolio performance for January 2016.

Report

Council holds a number of reserves in order to fund significant future liabilities or future objectives. These liabilities include insurance claims, employee leave entitlements and asset replacement. In addition, Council is also required to hold funds that under the *Local Government Act 1993*, are not permitted to be used for any other purposes than those originally collected for. These include developer contributions, specific purpose grants, domestic waste management, contributions and stormwater management funds.

Council invests funds through the financial instrument designated by the Ministerial Order from the Office of Local Government. The *Local Government Act 1993* and the *Local Government (General) Regulation 2005* require a monthly investment report be presented to Council.

Council's Investment Portfolio as at 31 January 2016 stood at approximately $111m. Funds are currently being managed both by Council staff and Fund Managers and are in accordance with the *Local Government Act 1993*, *Local Government (General) Regulation 2005* and Council's Investment Policy.

Council staff recently undertook an analysis of investment returns for other Councils to assess Council's performance in comparison as shown in Attachment 2 to this report. The results are fairly consistent though some fluctuations occur as a result of different risk profiles, investment length and establishment dates.

Portfolio Performance

Directly managed investments have consistently outperformed the AusBond bank bill index benchmark.

Monthly annualised return	January
Council Managed Funds	3.11%
Benchmark: AusBond Bank Bill Index	2.27%

Investment returns can fluctuate during any one reporting period based on market perceptions, or as in the case of funds under management, changes in asset classes. As such, any measurement of performance is better reflected over a rolling 12 month period to average out any fluctuations in monthly performance. Council's total investment portfolio has outperformed the benchmark on average over the last 12 months.

Rolling year to date return	January
Council Managed Funds	3.29%
Benchmark: AusBond Bank Bill Index	2.24%

Council's portfolio as at 31 January 2016 is diversified with 72% in term deposits of varying lengths of maturity which are managed in accordance with market expectations and Council's investment strategy, 23% in floating rate deposits which gives Council a set margin above either 30 or 90 day bank bills, 4% in fixed rate bonds, 1% in funds in a short term at call account.

Maturity profile	31 January
Short term at call	$1,021,414
0 – 3 months	$50,759,193
3 – 6 months	$43,679,657
6 – 12 months	$10,451,746
12 months +	$5,000,000

All investments are placed with approved deposit taking institutions. No funds are placed with any unrated institutions.

Credit exposure (S&P Long Term Rating)	31 January
AAA to AA-	61%
A+ to A-	32%
BBB+ to BBB-	7%
Other approved deposit taking institutions	0%

Economic outlook

The Board of the Reserve Bank of Australia (RBA) left the cash rate unchanged at the present level of 2% at its 2 February 2016 meeting in line with market expectations.

The statement of monetary policy accompanying the decision was relatively unchanged from recent months with the core message being expected continual improvement in growth, inflation levels are well contained and the scope to provide additional support to the economy through further interest rate cuts if required.

Summary

Council's investment portfolio continues to outperform the benchmark of the AusBond bank bill index. The Local Government Investment Guideline leaves little scope for the enhancement of Council's investment portfolio with the various investment products being offered. However, to enhance the portfolio, advantage is taken on the length of maturity of the investment given the rating of the institution, as well as reviewing any new investment products offered in consultation with Council's financial advisor, Spectra Financial Services.

Regular liaison with Council's external financial advisor assists in monitoring all of the risk factors to maximise Council's return on the investment portfolio, while minimising the risk associated with this strategy.

Officer's Recommendation

That the information be noted.

Committee's Recommendation: (Borg/Lake)

That the Officer's Recommendation be adopted.

CARRIED

Council Meeting 22 March 2016 (Mead/Lake)

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 34

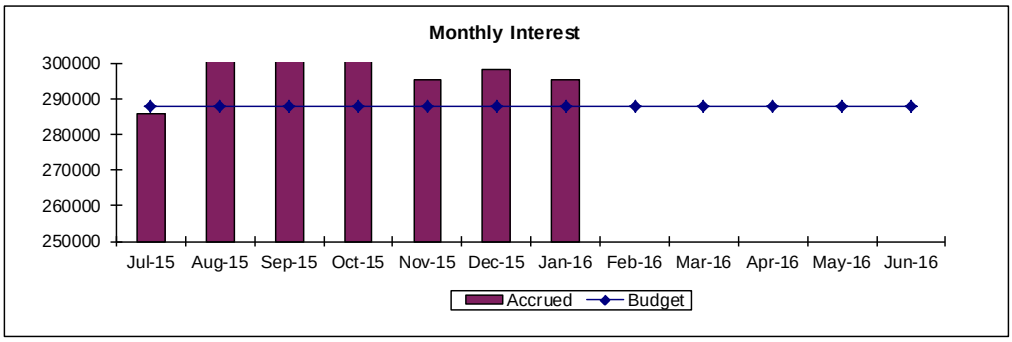
That the Officer's Recommendation be adopted.

ATTACHMENT 1

CAMPBELLTOWN CITY COUNCIL INVESTMENT PORTFOLIO
Summary January 2016

Benchmark	AusBond Bank Bill Index
Portfolio Balance	$110,912,010.55

Monthly Performance	Return (mth)	Return (pa)
AusBond Bank Bill Index	0.19%	2.27%
Total Portfolio	0.26%	3.11%
Performance to Benchmark	+ 0.07%	+ 0.84%
Portfolio - Direct Investments	0.26%	3.11%
Performance to Benchmark	+ 0.07%	+ 0.84%
Short Term Call Account	0.20%	2.40%



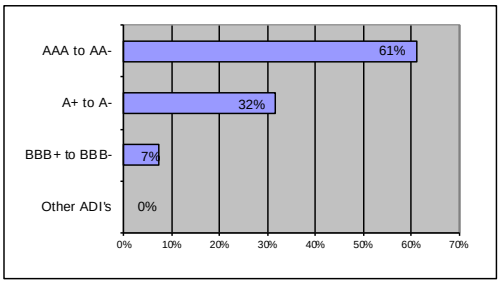
Year to Date Performance

Rolling 12 Month Period
3.29% Council Managed Funds
2.24% Benchmark

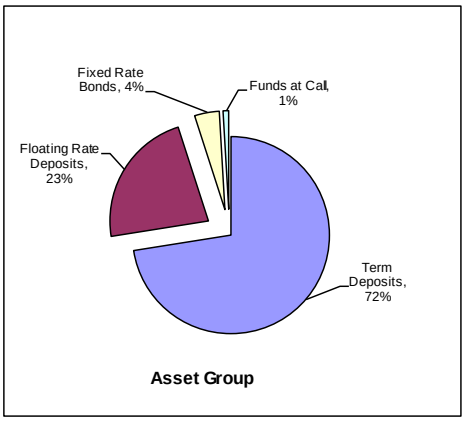
Interest Budget to Actual

Average Budget to Period	$2,014,658
Actual Accrued to Period	$2,095,720

Credit Exposure (S&P Long Term Rating)



Portfolio Diversity



			%
NAB Funds at Call	$ 1,021,413.61	AA-	1%
NSW Treasury	$ 2,810,000.00	AA+	3%
National Australia Bank	$ 39,057,440.34	AA-	35%
ANZ Bank	$ 3,500,000.00	AA-	3%
Westpac Bank	$ 4,000,000.00	AA-	4%
Commonwealth Bank	$ 5,000,000.00	AA-	5%
Bank Western Australia	$ 12,311,757.97	AA-	11%
AMP Bank	$ 4,051,972.60	A+	4%
Suncorp Metway	$ 13,062,849.31	A+	12%
Macquarie Bank	$ 3,000,000.00	A	3%
Rural Bank	$ 6,000,000.00	A-	5%
Bank of Queensland	$ 9,063,710.96	A-	8%
Credit Union Aust	$ 3,000,000.00	BBB+	3%
ME Bank	$ 5,032,865.76	BBB+	5%
	$110,912,010.55		100%

ATTACHMENT 2

Investment Returns Comparison between Councils

Council	Total Portfolio	Risk Profile	Returns / Analysis
Campbelltown 31 Jan 2016	$111m • Cash • Floating Rate Deposits • Fixed Rate Bonds • Term Deposits	S&P Long Term Rating >=A ($103m) <=BBB ($8m)	3.34% annualised yearly (Dec) 3.29% annualised yearly (Jan) 3.11% monthly return (Jan) Conservative policy with 95% of funds having less than twelve months to maturity with low risk institutions with a rating of A or higher. Councils $8m investments held in BBB are for durations of less than 12 months (short term) and therefore are deemed to be rated A-2. Lowest 2.85% Highest 6.75%
Wollondilly 31 Dec 2015	$50m • Bonds • Cash • Floating Rates Notes • Mortgage Backed Securities • Term Deposits	>=A ($47.5m) <=BBB ($2.5m)	3.19% comparable deposits of <=12 months 3.37% total portfolio Annualised returns inflated due to long term bank bonds yielding between 6% and 7.17%. Lowest 2.70% Highest 7.17%
Penrith 30 Nov 2015	$106m • Cash • Floating Rate Notes • Term Deposits	>=A ($106m)	2.95% total portfolio monthly return Annualised return indeterminate as length of maturities not specified, however lower risk term deposits with institutions with a rating of A or higher, account for 77% of total portfolio.
Liverpool 31 Dec 2015	$173m • Cash • Floating Rate Notes • Mortgage Backed Securities • Term Deposits	>=A ($145m) <=BBB ($18m) Unrated ($10m)	2.3%-2.9% comparable deposits of <=12 months 3.45% total portfolio Annualised return indicates over 30% of investments are in floating rate notes and 28% with longer maturity lengths of 1-3 years. Returns are increased due to % of funds held with lower rated or unrated institutions (higher risk).
Holroyd 31 Dec 2015	$73m • Cash • Floating Rate Notes • Fixed Rate Bonds • Term Deposits	>=A ($64.5m) <=BBB ($12.5m)	2-3% comparable deposits of <=12 months 3.24% total portfolio Annualised return increased due to long term fixed and floating rate notes with lengths of maturity up to 5 years.
Camden 31 Dec 2015	$105m • Cash • Term Deposits	>=A ($105m)	3.37% average total portfolio return which is comparable with Campbelltown. 100% of portfolio consists of cash and term deposits with a significant amount held in longer dated maturities with interest rates averaging 4%. Lowest 2.35% to Highest 5.10%

4. HUMAN RESOURCES

No reports this round

5. INFORMATION MANAGEMENT AND TECHNOLOGY

No reports this round

6. INTERNAL AUDIT

No reports this round

7. GENERAL BUSINESS

Nil.

Confidentiality Motion: **(Lake/Greiss)**

That the Committee in accordance with Section 10A of the *Local Government Act 1993,* move to exclude the public from the meeting during discussions on the items in the Confidential Agenda, due to the confidential nature of the business and the Committee's opinion that the public proceedings of the Committee would be prejudicial to the public interest.

CARRIED

24. CONFIDENTIAL ITEMS

24.1 Licence Agreement for Campbelltown Camden District Band Incorporated

Reason for Confidentiality

This report is **CONFIDENTIAL** in accordance with Section 10A(2)(c) of the *Local Government Act 1993*, which permits the meeting to be closed to the public for business relating to the following: -

(c) information that would, if disclosed, confer a commercial advantage on a person with whom the council is conducting (or proposes to conduct) business.

Motion: **(Lake/Mead)**

That the Committee in accordance with Section 10 of the *Local Government Act 1993,* move to re-open the meeting to the public.

CARRIED

There being no further business the meeting closed at 5.40pm.

C Mead
CHAIRPERSON

REPORTS FROM OFFICERS

8. REPORT OF GENERAL MANAGER

No reports this round

9. REPORT OF DIRECTOR BUSINESS SERVICES

9.1 Reports Requested

Attachments

Status list of reports requested (contained within this report)

Report

Attached for the information of Councillors is a status list of reports requested of Council as at 16 February 2016.

Officer's Recommendation

That the information be noted.

Council Meeting 22 March 2016 (Lake/Borg)

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 35

That the Officer's Recommendation be adopted.

ATTACHMENT 1

Reports Requested as at 16 February 2016

*Date of Decision *Mover *DocSet	Item/Comments	Div.Resp	Comp Date
Community Services			
03.06.14 BT 3859092	CS3.5 - That a report be provided examining the feasibility of establishing an 'artist walk' as part of the new street scape in Queen Street, Campbelltown. **Comment:** proposal cannot be undertaken until City Works report on footpath upgrades is completed.	CS	June 2016
29.7.14 PL 3934158	CG3.3 - Report identifying alternative methods for managing the hire of Council's sporting fields. **Comment:** Sport and Recreation plan currently being commissioned.	CS	April 2016
24.04.15 MO 4275729	CS2.1 - That a further report be provided to Council: • outlining the National Disability Insurance Scheme transition process once this information becomes available. • on the Regional Assessment Service once details on the funding and service requirements are available. **Comment:** awaiting further information from the federal government to complete a detailed report back to Council.	CS	April 2016
City Works			
18.08.15 PH 4439247	CW1.4 - That a further report be tabled for Council consideration upon completion of the specialist consultant's investigations on possible large scale reforms to the street lighting network and on the option of converting the complete network to an LED solution and possible Council ownership of the network. **Comment:** Presentation given at Briefing night 1 March 2016. Report being finalized for April 2016 Committee Meeting.	CW	April 2016

*Date of Decision *Mover *DocSet	Item/Comments	Div.Resp	Comp Date
Business Services			
18.6.13 PL 3450946	CG3.1 - Further report following expressions of interest on the ground lease in Blaxland road. **Comment:** Currently reviewing draft lease and obtaining information requested by agents.	BS	June 2016
29.7.14 PL 3934173	CG2.2 - Further report prior to entering into a licence agreement for the provision of a coffee cart operation within the Campbelltown Civic Centre building. **Comment:** Undertaking an amended marketing campaign through an agent for café opportunities on Council land.	BS	April 2016
14.10.14 RK 4033794	CG2.3 - 4. That a further report will be submitted to Council once a draft VPA/Infrastructure Services Delivery Plan (ISDP) have been finalised which will deal with the compulsory acquisition/land transfer issues concerning the whole of the Claymore Urban Renewal Project. **Comment:** Still in the process of finalising the VPA/ISDP with Urban Growth. Currently awaiting response from Urban Growth.	BS	May 2016
17.02.15 PH 4188336	CG2.1 - That Council note the information contained in this report and that a further report be submitted to Council once the Roads and Maritime Services has made an offer for the compulsory acquisition of the land. **Comment:** RMS has indicated it will compulsorily acquire the land. This is a 6-9month process.	BS	June 2016

*Date of Decision *Mover *DocSet	Item/Comments	Div.Resp	Comp Date
Planning and Environment			
13.12.11 BT 3421776	2.4PE - Further Report detailing the outcome of all submissions received as a result of the public exhibition of all Menangle Park documentation. **Comment:** discussions between the General Manager and State Government regarding infrastructure are yet to occur.	PE (EP)	May 2016
13.12.11 RK 3421767	2.5PE - Report following the exhibition period detailing all submissions and the outcomes of the exhibition - Draft Macarthur Precinct DCP. **Comment:** Placed on hold pending the outcome of Glenfield-Macarthur Urban Renewal Corridor. Corridor Strategy delayed due to redesign of Glenfield Town Centre following commencement regarding Hurlstone Agricultural High School.	PE (EP)	June 2016
5.6.12 RK 3068270	PE5.2 - Report outlining the role, procedures and limits of authority of the Land and Environment Court in so far as they affect amendments to development applications made as part of the Court proceedings. **Comment:** further information is being investigated and considered.	PE (DS)	April 2016
18.6.13 RK 3451045	PE2.4 - Report identifying what impact the creation of the Local Land Services will have on the Campbelltown LGA.	PE (EP)	March 2016
16.7.13 RK 3483315	PE4.1 - Further report to review implementation of the draft Swimming Pool Barrier Inspection Program including the cost and resourcing implications after 12 months of the programs implementation. **Comment:** Trial completed mid December 2014, information being collated. Additional time required to assess impact of the implementation of the provisions of the *Swimming Pools Act 1992* requiring pool owners to obtain a Certificate of Compliance before selling or leasing their property commencing on 29 April 2016	PE (CS)	August 2016

*Date of Decision *Mover *DocSet	Item/Comments	Div.Resp	Comp Date
14.10.14 CM 4033787	CG6.1 - 1.That a report be presented on the development application process, particularly as it relates to residential and small business, regarding: (i) DA approval times – including a comparison to Camden and the councils that fall within the Group 7 Metropolitan Fringe category of the Office of Local Government's Comparative Data publication. (ii) The types of developments which require approval in Campbelltown but do not require approval in other similar councils (e.g. Group 7 councils and Camden). 2.That Council contact the NSW Business Chamber and the local Chambers of Commerce and report on their suggestions regarding: (i) How Council could streamline the DA process for small business. (ii) Any developments currently requiring approval which they believe would be appropriate to be made exempt. **Comment:** Investigation continuing into this matter.	PE (DS)	May 2016
27.10.15 GG 4526199	PE5.2 - That Council's Public Notification Policy, in respect to Development Applications, be reviewed and a report provided back to Council recommending options for a more comprehensive community notification process.	PE (EP)	April 2016
15.12.15 RK 4607896	PE5.2 - 1.That a full report be presented to Council outlining the cost of a pet giveaway and the likely implications for sales from the Animal Care Facility in the balance of the year. 2.That the report include information about the potential for pets freely given from the Animal Care Facility to be abandoned by virtue of the fact that they were acquired at no cost. Comment: Investigations still underway.	PE (CS)	April 2016
16.02.16 RT 4676538	PE5.1- That a report be presented investigating waste management strategies for the control of junk mail and newspapers within high density dwellings.	PE (EP)	May 2016

*Date of Decision *Mover *DocSet	Item/Comments	Div.Resp	Comp Date
Strategy			
29.7.14 PL 3934241	CW5.1 - detailed report on the Leumeah Sports Precinct by the Strategic Planner for a new 40,000 seat sporting/entertainment complex with parking facilities to include both the eastern and western side of the railway line. **Comment:** scoping investigations proceeding under direction of the General Manager.	Strategy (DSt)	May 2016
29.7.14 GG 3939939	PE5.3 - Report investigating possible further partnerships with University Western Sydney, Campbelltown and Campbelltown TAFE. **Comment:** Awaiting outcome of further discussions with TAFE and UWS concerning potential economic development initiatives focused on the proposed Campbelltown Health and Education Precinct.	Strategy (DSt)	May 2016
17.02.15 GG 4189107	PE3.3 - 3. That a future report be presented to the Council which investigates options and identifies practical limits for a core Campbelltown CBD precinct, for the purposes of permanently varying the commercial parking rates within that precinct. **Comment:** Campbelltown CBD Parking nearing finalisation by Consultants.	Strategy (DSt)	May 2016
24.04.15 GG 4275787	PE2.6 - The Council receive a further report on a proposal to establish a Business Advisory Board following further consultation with the Campbelltown and Ingleburn Chambers of Commerce. **Comment:** Continues to be under investigation.	Strategy (DSt)	May 2016

9.2 Progress Report: Amounts Expended on Providing Facilities and Payment of Expenses - Mayor, Deputy Mayor and Councillors February 2016

Attachments

Nil

Report

On 15 September 2015, Council reviewed its policy concerning payment of expenses and provision of facilities to the Mayor, Deputy Mayor and Councillors.

Section 217 (a1) of the *Local Government (General) Regulation 2005* requires councils to include additional information for inclusion in annual report:

(a1) details of the total cost during the year of the payment of the expenses of, and the provision of facilities to, councillors in relation to their civic functions (as paid by the council, reimbursed to the councillor or reconciled with the councillor), including separate details on the total cost of each of the following:

(i) the provision during the year of dedicated office equipment allocated to councillors on a personal basis, such as laptop computers, mobile telephones and landline telephones and facsimile machines installed in councillors' homes (including equipment and line rental costs and internet access costs but not including call costs)

(ii) telephone calls made by councillors, including calls made from mobile telephones provided by the council and from landline telephones and facsimile services installed in councillors' homes

(iii) the attendance of councillors at conferences and seminars

(iv) the training of councillors and the provision of skill development for councillors

(v) interstate visits undertaken during the year by councillors while representing the council, including the cost of transport, the cost of accommodation and other out-of-pocket travelling expenses

(vi) overseas visits undertaken during the year by councillors while representing the council, including the cost of transport, the cost of accommodation and other out-of-pocket travelling expenses

(vii) the expenses of any spouse, partner (whether of the same or the opposite sex) or other person who accompanied a councillor in the performance of his or her civic functions, being expenses payable in accordance with the *Guidelines for the payment of expenses and the provision of facilities for Mayors and Councillors for Local Councils in NSW* prepared by the Director-General from time to time

(viii) expenses involved in the provision of care for a child of, or an immediate family member of, a councillor, to allow the councillor to undertake his or her civic functions.

These expenses are calculated on a monthly basis and reported to Council. Expenses for the month of February 2016 were as follows:

Expenses

1.	**Training Seminars and Conferences** Cost for February 2016.	$6,038
2.	**Staff** Personal Secretary for the Mayor on a shared basis with the General Manager, together with Receptionist shared with Corporate Services. Apportioned cost for February 2016.	$5,047
3.	**Stationery and Postage** Cost of Mayoral and Councillors' stationery, business cards and postage expenses. Approximate cost for February 2016.	$3
4.	**Periodicals** Cost of annual subscriptions. Cost for February 2016.	$134
5.	**Meals** Provision of meals in conjunction with Council and Committee Meetings and Inspections. Cost for February 2016.	$1,620
6.	**Refreshments** Provision of refreshments in the Mayor's Suite and Councillors' Lounge and Civic Receptions. Cost for February 2016.	$1,451
7.	**Insignia of Office** Replacement costs Mayoral robes, chain, badge and name plates. Cost for February 2016.	Nil
8.	**Travelling Expenses for Use of Private Vehicle** Reimbursement of travelling expenses on authorised Council business. Claims submitted for February 2016.	$1,052

Provision of Facilities

1.	**Accommodation** Office located on the Third Floor of the Administration Building - costs are included in total maintenance and operating expenses of the Administration Building and apportioned on an area basis (3.5%). Cost for February 2016.	$5,145
2.	**Communication System** Mobile telephone, personal computer or a laptop, personal digital assistant and combined printer, copier, scanner, facsimile machine and telephone answering machine provided for the Mayor and Councillors. Cost of equipment for February 2016 in accordance with Councillors Policy.	$1,437

3. **Office Equipment**
Facsimile machines, photocopier and telephone facilities for the Mayor and Councillors at the Civic Centre. Cost for February 2016. $426

4. **Council Vehicle**
Costs associated with the use of Council vehicles by the Mayor and Councillors on authorised Council business. All usage is subject to the prior approval of the Mayor. Cost for February 2016. $90

5. **Internet Facilities**
Costs associated with the provision of internet facilities in accordance with Council's Policy. Cost for February 2016. $1,607

The total cost for the payment of expenses and provision of facilities to the Mayor, Deputy Mayor and Councillors for February 2016 amounted to $24,050.

Officer's Recommendation

That the information be noted.

Council Meeting 22 March 2016 **(Greiss/Matheson)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 36

That the Officer's Recommendation be adopted.

10. REPORT OF DIRECTOR CITY WORKS

10.1 City Works Activity Report

Attachments

Activity Report (contained within this report)

Report

Works activities are proceeding to program and on demand and are outlined in the Activity Report. Statistics on graffiti are also presented in the Activity Report. It should be noted that the Activity Report continues to be reviewed to better reflect the areas and program/projects being undertaken by Council.

Officer's Recommendation

That the information be noted.

Council Meeting 22 March 2016 **(Lake/Borg)**

That the Officer’s Recommendation be adopted.

Council Resolution Minute Number 37

That the Officer’s Recommendation be adopted.

ATTACHMENT 1

OPERATIONAL SERVICES SECTION (Reporting period 25 January – 28 February 2016)

GRAFFITI

The Graffiti Action Team has for the period undertaken the following graffiti tasks to various Council assets.

Area	July to Sept 2014	Oct to Dec 2014	Jan to Mar 2015	Apr to June 2015	July to Sept 2015	Oct 2015	Nov 2015	Dec/ Jan 2016	Feb 2016
Area 1	3301	2706	2959	2212	2770	777	1087	975	830
Area 2	2228	2309	3285	1534	3260	311	974	559	694
Area 3	848	570	1384	1122	1453	300	463	601	402
Area 4	2368	1852	2730	1888	2429	404	1195	879	1337
Total	8745	7437	10358	6756	9912	1792	3719	3014	3263

During the reporting period 2 Graffiti Removal Kits have been requested by the Community.

July to Sept 2014	Oct to Dec 2014	Jan to Mar 2015	Apr to June 2015	July to Sept 2015	Oct 2015	Nov 2015	Dec/ Jan 2016	Feb 2016
16	12	32	4	22	1	2	9	2

OPEN SPACE

Activity	Area 1	Area 2	Area 3	Area 4	Total
Servicing of Parks and Reserves (Sites)	107	63	79	53	302
Road Verges (Sites)	64	54	32	47	197
Community/Childcare Centre's (Sites)	8	7	11	9	35
Servicing Laneways (Sites)	71	50	63	47	231
Litter/Rubbish Pickup	86	104	88	41	319
Herbicide Spraying (hrs)	17	0	0	6	23
Mulching (m^3)	0	0	0	0	0
Garden Maintenance	0	0	0	0	0
Garden Refurbishment	0	0	0	0	0
Top Dressing (hrs)	0	0	0	0	0
Aeration of Fields	0	0	0	0	0
Sharps Pickup	0	0	0	0	0
Pathway Requests	28	33	13	10	84
Tractor Road Verge (Sites)	28	11	19	35	93
Tractor Servicing Parks and Reserves (Sites)	58	27	37	35	157
Cemetery	0	0	0	0	0
Fire Hazard Reduction	0	0	0	0	0
Road Crews Servicing Parks	0	0	0	0	0
Refilling of Sandpits	0	0	0	0	0

HORTICULTURE

Activity	Area 1	Area 2	Area 3	Area 4	Total
Servicing of Parks and Reserves (Sites)	40	42	39	35	156
Road Verges (Sites)	25	44	21	20	110
Community/Childcare Centre's (Sites)	17	16	12	6	51
Cemetery	0	0	0	0	0
Tractors Servicing Sporting Fields	44	30	47	35	156
Litter/Rubbish Pickups (hrs)	47	49	31	28	155
Herbicide Spraying (hrs)	11	12	31	27	81
Mulching (m^3)	0	0	80	40	120
Garden Maintenance (Sites)	59	44	71	80	254
Garden Refurbishment (Sites)	9	3	0	1	13
Top Dressing (tonne)	11	0	0	0	11
Aeration of Fields (Sites)	0	0	0	0	0
Sharps Pickups	0	0	0	0	0
Miscellaneous Requests	0	0	0	0	0
Refilling of Sandpits	0	0	0	0	0
Plumbing	22	22	30	31	105
Placing of goal posts (Sites)	3	3	10	5	21
Cricket Wicket Maintenance	36	29	55	38	158

HORTICULTURE ACTIVITIES

Mulching

Mulching activities were undertaken at Hallinan Park and Park Central.

Mawson Park

Preparation for planting of the gardens is currently being undertaken.

Additional plants have been ordered.

Coronation Park

Planter boxes being prepared.

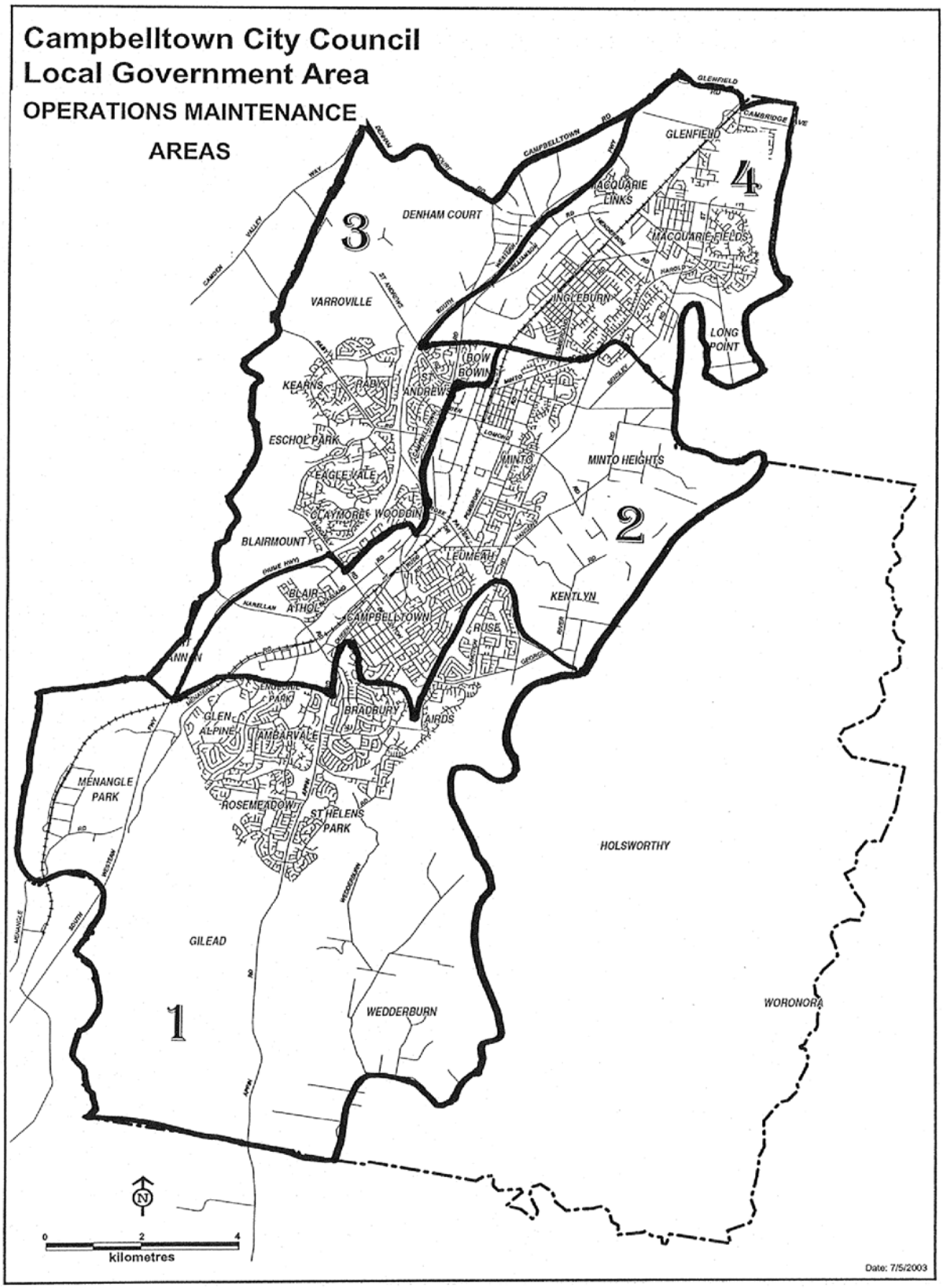
Plants have been ordered and planting is expected to be carried out over the next couple of weeks.

COUNCIL TREE INSPECTIONS

Activity	Area 1	Area 2	Area 3	Area 4	Total
Contract	36	19	32	30	117
Council	100	78	94	121	393
Termites	0	1	1	0	2
Plumber - Sewer Chokes	1	0	0	0	1
N/A	11	13	8	7	39
HOLD	0	1	1	0	2
Total	148	112	136	158	554

PRIVATE PROPERTY TREE INSPECTIONS

Activity	Area 1	Area 2	Area 3	Area 4	Total
Private Trees	26	16	16	40	98


Campbelltown City Council
Local Government Area
OPERATIONS MAINTENANCE
AREAS
1
2
3
4
GLENFIELD
CAMBRIDGE AVE
CAMPBELLTOWN RD
DENHAM COURT
ACQUARIE LINKS
MACQUARIE FIELDS
INGLEBURN
VARROVILLE
LONG POINT
BOW BOWIN
KEARNS
PARK
ST ANDREWS
ESCHOL PARK
MINTO
MINTO HEIGHTS
EAGLE VALE
CLAYMORE
WOODBIN
BLAIRMOUNT
LEUMEAH
BLAIR ATHOL
KENTLYN
CAMPBELLTOWN
RUSE
GLEN ALPINE
AMBARVALE
BRADBURY
AIRDS
MENANGLE PARK
ROSEMEADOW
ST HELENS PARK
HOLSWORTHY
GILEAD
WEDDERBURN
WORONORA
N
0
2
4
kilometres
Date: 7/5/2003

ROADS AND DRAINAGE

A. HEAVY PATCHING - Roads And Footpaths

Activity	Area 1	Area 2	Area 3	Area 4	Total
Road repairs heavy patching (sqm)	264	97	180	64	605
Road restorations (sqm)	21	10	0	8	39
AC Base Course Total (T)	36	25	29	21	111

B. MINOR PATCHING - Roads And Footpaths

Activity	Area 1	Area 2	Area 3	Area 4	Total
Pot holes (no.)	212	108	185	231	736
Edge breaks (LM)	0	34	15	0	49
Restorations (sqm)	74	32	22	45	173
Car parks pot holes (no.)	40	106	6	23	175
Trip Hazard Footpaths (no.)	41	8	15	0	64

C. ROADS RESERVE OPENING & RESTORATIONS

Activity	Area 1	Area 2	Area 3	Area 4	Total
Vehicle crossings constructed	11	14	31	22	78
Telstra Inspections	1	3	4	3	11
Sydney Water inspections	4	4	6	9	23
Endeavour Energy Inspections	2	4	5	7	18
Jemena Gas Inspections	0	2	6	4	12
NBN	1	7	11	5	24
Customer & Road Opening requests	2	5	13	9	29

D. MULTI FUNCTIONAL VERGE

Activity	Area 1	Area 2	Area 3	Area 4	Total
Cleaning of gross pollutant trash	18	0	3	6	27
Pits cleaned by hand or suction	77	24	269	69	439
Tail out drains/headwalls	27	13	4	0	44
Removal of waste matter (m^3)	2	18.9	3	0	23.9
Flushing of stormwater lines (LM)	2350	355.9	950	700	4355.9
Underpass (drainage) cleaning	3	3	0	0	6
Trip hazards/footpath hazards	13	26	15	9	63
Dead animals removed	9	7	5	8	29
Parra webbing drainage	11	11	2	9	33
Sign retrievals and straightening	1	3	1	1	6
Syringes	12	215	6	3	236
Deliver and set up at venues	1	3	0	6	10
Paver repairs (sqm)	0	53	0	0	53
Oil/ paint spill/debris on road	5	4	5	8	22
Median cleaning/poisoning (LM)	438	200	317	882	1837
Guide Posts	14	3	0	0	17

E. STREET ACCESSORIES - Sign Manufacturer

Activity	Area 1	Area 2	Area 3	Area 4	Total
Regulatory signs	7	23	0	12	42
Street signs	9	2	6	0	17
Ordinance signs	7	10	12	0	29
Directional signs	10	7	14	0	31
Warning signs	0	10	0	0	10
Community signs	0	39	0	6	45
Various council signs	6	9	6	6	27
Council special events	0	55	0	0	55
Banners/ Posters	0	0	0	0	0
Various Stickers / Labels	2	158	8	2	170
Total	41	313	46	26	426

Sign Erection

Activity	Area 1	Area 2	Area 3	Area 4	Total
Regulatory signs	40	62	36	27	165
Street signs	2	1	8	9	20
Ordinance signs	12	15	10	5	42
Directional signs	7	10	16	20	53
Warning signs	36	44	1	4	85
Community signs	3	2	11	6	22
Various council signs	0	0	0	0	0
Banner / Bin Installation	5	5	0	3	13
Graffiti Removal (sqm)	4	2	4	0	10
Works orders (traffic)	2	3	2	1	8
Bollard replacement/ repair	15	14	7	6	42
Line Marking/Car Park (sqm)	2	2	0	0	4

F. FOOTPATH RECONSTRUCTION PROGRAM 2015 – 2016

Stage 1B - 50% complete.
Stage 2 - 100% complete.

G. NEW FOOTPATH CONTRUCTION PROGRAM 2015 – 2016

Stage 1B - 90% complete.

H. KERB AND GUTTER RECONSTRUCTION 2015 – 2016

Stage 2 - 96% complete.
Stage 3A - 95% complete.
Stage 3B - 15% complete.

I. FOOTPATH GRINDING PROGRAM 2015 – 2016

20% complete.

J. PAMPS PROGRAM

35% complete.

K. ROADS PROGRAM 2015 – 2016

89% complete.

L. OPERATIONS MINOR WORKS

Animal Facilities Various Works – 60% complete.

Staff Car Park CCTV Works – 100% complete.

Lincoln Street, Minto - Replacement of collapsed stormwater pipe due to storm event - 80% complete.

M. CAPITAL WORKS

Eagle Vale Drive Road Stage 3 (Widening and Roundabout) - 87% complete.

Eagle Vale Drive Road (Wynn Street to Badgally Road) – 60% complete.

Noorumba Fire Trail Drainage Works and Embankment Stabilisation Works – 0% complete. Pending environmental assessment.

Lynwood Park Soccer Synthetic Turf Installation – 100% complete.

Mawson Park ANZAC Memorial – 35% complete.

Menangle Road Cycleway – 50% complete.

Coogan Lane (Additional Car Park) – 15% complete

PLUMBERS ACTIVITIES REPORT

Irrigation Works - Council's irrigation team has been involved in maintenance activities and system checks across the LGA, works have involved changing sprinkler heads, repairing leaks, pump systems, damaged pipes, wiring problems and testing of systems.

WORKSHOP ACTIVITIES REPORT

Vehicles/Plant and Equipment, reported here, are items that have accrued abnormal downtime due to awaiting parts/service from suppliers or priorities.

Plant No	Item	Reason - Area of Repair	Repairer	Down Time Hrs
9767.02	Horticulture Truck	Rust repairs in back tray area	CCC Workshops and Supplier	**80hrs**

The following is a breakdown of the work performed since the last report **25 January – 28 February 2016.**

9973.02	Rust repairs have been completed and the truck is back in service.

All previous reported repairs have been completed and vehicles/plant are back in service.

Tyre Repairs	45
Services carried out	33
Repairs to trucks	62
Repairs to heavy plant	32
Repairs to trailers	28

Tractors/implements	39
SES repairs	0
RFS repairs	12
Small plant repairs	43
Repair to cars	9
Repairs to mowers	42
Repairs to sweepers	14
Pathway requests (completed)	6

Of the reported repairs above 18 were out in the field.

The Workshops Solar panel main power switch was turned off. As a result the total amount remains the same as the previous month at **62,803 kWh** back to the grid.

The Workshop has also carried out the following duties:

- Manufacture and repair of various gates, locks, lock boxes and grates.
- Trailer repairs and modifications.
- Manufacture and repairs of truck bodies.

HAZARD REDUCTION PROGRAM

Hazard Reduction Burning - No hazard reduction burning has been conducted in the reporting period.

Asset Protection Zones Maintenance - 30 hazard reduction treatments were completed in the reporting period, totalling an area of 24.135 hectares with 645 assets protected.

Fire Trails – Construction of a concrete causeway for improved access was undertaken along Smiths Creek fire trail 1.6.

Fire Trail Gates – No fire trail maintenance was undertaken during the reporting period.

Facilities Support Services

Customer Requests	
Sporting Clubs with overdue keys	39 Clubs with 362 keys outstanding
Key access renewals, issues, alarm codes and access	270
Request for access to Council Reserves	6

ASSETS AND SUPPLY SERVICES

Procurement and Contract Management Services

Tenders/Quotes/Expressions of Interest and Agreements:

Tenders/Quotes currently being prepared:

- T15/19 Supply and Construct Recycling Shed at Suez site
- T15/20 Design and Construct Workshop at Suez site
- T16/05 Cleaning of Council Facilities and Depot
- T16/06 Supply and Transport Streetsweeper Waste Bin, Depot Bulk Bin

- T16/07 Processing and Disposal of Waste from Depot Bulk Bin and Casual Skip Bins
- T16/08 Processing and Disposal only of Streetsweeper Waste
- T16/09 Supply and Servicing Front Lift Bins
- T16/11 Sports Grounds Floodlight Installation, Upgrades and Repairs
- T16/13 Concrete Minor Works
- T16/14 Irrigation Services
- T16/15 Fisher's Ghost Festival Carnival Activities
- T16/16 Saw Cutting
- T16/17 HVAC
- T16/18 Concrete Program

Tenders/Quotes currently advertised:

- Q16/01 Road Condition Survey
- Q16/02 Rate Notice Production
- Q16/03 Gutter Cleans
- T15/17 Traffic Signals on Eagle Vale Drive
- T16/03 General Trades Miscellaneous
- T16/10 Horticultural Services

Tenders/Quotes currently under evaluation:

- T15/31 Plumbing Services
- T16/01 Roofing Services
- T16/02 Floodlight Pole and Fixture Inspections
- T16/04 Cleaning of Campbelltown Sports Stadium
- T16/12 Demolition of Buildings

ASSET MANAGEMENT

Roads

- The treatments for sections included in Road Renewal Program 2016-2017 have been validated.
- Road Renewal Program 2015-2016 Stage 1 is 100% completed.
- Road Renewal Program 2015-2016 Stage 2 is 39% completed.

Car Parks

- Car Park Inspection program for 2015-2016 is 15% completed.

Bridge and Culvert

- The work for safety barrier fencing repair at Stennett Road Bridge and Minto Road major culvert is completed.
- The bridge joint repair over the railway at Henderson Road is 75% completed.
- The corrosion repair at three pedestrian bridges in Macquarie Fields is 10% completed.
- The concrete cover replacement work for Gilchrist Drive Road Bridge has been awarded.
- The Bridge and Culvert Related Footpath Reconstruction has been sent out again for pricing.

Kerb and Gutter

- The Traffic Management Device Inspection Program for 2015-2016 is 100% completed.

Footpath

- The footpath condition inspection is 30% completed.
- The Footpath Program for 2016- 2017 has been prepared and submitted to the Procurement Section for tendering.

Stormwater

- 30 new stormwater pits and pipes have been captured in the system and mapped in MapInfo.

Parks and Public Spaces

- Between 8 February and 10 March, 2016, 933 assets were inspected at Parks and Reserves. This is a total of 91% of Parks and Reserve assets inspected to new inspection parameters.
- All reactive issues discovered have been reported and all conditions and actions have been updated in Council's Asset Management System.
- 26 Pathways requests have been forwarded to Operations as results of these inspections.
- Simmos Beach Steps (South) construction: Work has commenced and is due for completion early April 2016.
- Park Furniture and Litterbins have been installed at all new playground sites.

Building Inspections

- Building inspections are up to date.
- Inspections of "Other structures" have been completed.
- All reactive issues discovered have been reported and all conditions and actions have been updated in Council's Asset Management System.

Playground Equipment

- Reactive Repairs - Reactive repairs have been carried out at two locations.
- Operational playground inspections have been completed by the Consultant.
- Playground Program Maintenance has been completed at the following locations. Works include repainting and addressing compliance issues:

  -Spence Reserve, St Helens Park
  -Trotwood Reserve, Ambarvale
  -Oswald Reserve, Rosemeadow
  -Simmos Beach, Macquarie Fields
  -Digger Black Reserve, Ingleburn
  -Swan Reserve, Ingleburn
  -Bon Wrightson Reserve, Campbelltown
  -Colorado Reserve, Kearns
  -Flying Pieman Park, Eschol Park
  -Macquarie Fields Leisure Centre
  -Bellevue Park, Leumeah

- Replenishment of soft fall mulch has been completed for four sites.

2015-2016 Innovative Play Spaces Program

Installation updates are as follows:

- Moncrieff Reserve, St Helens Park is now completed.
- Merino Park, Airds is now completed.
- Gargery Reserve, Ambarvale is now completed.
- Salter Reserve, Minto is now completed.
- Macquarie Field Indoor Sports is now completed.
- Budbury Reserve, Glenfield is now completed.

Internal Assets– Electrical Testing and Tagging

- 850 items of electrical equipment have been tested at locations throughout Local Government Area.

Asset Management System, Grants and Reports

- Roads and Maritime Services monthly report for February has been sent.

BUILDING MAINTENANCE/CONSTRUCTION PROGRAM

Reactive Maintenance

There were 346 reactive maintenance requests during the months of February to March, 2016.

Building Program Maintenance

- **Fullwood Rugby League New Amenities Building** – Works are completed along with Telstra line connection. A final acquittal report has been sent to the Community Grants Program Office as well as a request for an official opening by the Minister.

- **Animal Care Facility** – Works are continuing at the Animal Care Facility inclusive of a grooming room, food preparation room and storeroom.

- **Blinman Oval**– Brick work is now completed and internal rendering has commenced, works are on schedule.

- **Eschol Park 3 Store room and enclosed BBQ area** – 90% complete with only site cleaning to be undertaken.

- **Worrell Park Amenities** – Brick work has commenced, works are on schedule.

- **Woodlands Baseball Complex –** Construction of a new store room and toilets have commenced. Works are estimated to take six weeks.

- **Jackson Park Awning** – Construction of a concrete slab and awning is now completed.

10.2 Western Sydney Rail Alliance

Attachments

1. Scope of State and Federal Governments Joint Study (contained within this report)
2. Likely Western Sydney Rail Alliance Partners (contained within this report)

Purpose

This report seeks Council's endorsement to participate in a collaboration of Western Sydney Councils and key private stakeholders (referred to as the Western Sydney Rail Alliance) to advocate for the planning and construction of a "north-south" rail link proposed to run between Campbelltown and Rouse Hill, that would connect Campbelltown more directly with:

- Western Sydney Airport
- Broader Western Sydney Employment Area
- St Marys and thence to the Penrith Regional City Centre
- The North West Rail link (Rouse Hill and Norwest Business Park).

The north–south rail concept would support the development of the Western University's Innovation Corridor and would potentially enhance connectivity with facilities such as the Sydney Science Park, Penrith Education and Health precinct and the Norwest Business Park. Conversely, the link would connect people living in the South West Growth Centre and the North West Growth Centre with regional facilities in Campbelltown.

This report recommends that Council support the Western Sydney Rail Alliance to advance the case for the north-south rail link project with government and key institutions, and make a contribution to the cost of preparing specialist technical studies to underpin the strategic business case for this "city shaping item of infrastructure".

The long term benefits of such a project that stand to be gained by the Campbelltown community from the realisation of the north-south rail link proposal are remarkable.

History

Council has been and continues to be an active and significant advocate in South-Western Sydney to improve the extent to which Government plans, funds and delivers policy as well as key infrastructure projects to enhance the liveability and sustainability of Campbelltown City, its community and businesses.

This is particularly important given the extent of future metropolitan scale urban growth and development that is planned to take place in Campbelltown and South West Sydney more generally.

To maximise Council's effectiveness in influencing positive change for Campbelltown, staff have identified the importance of participating collaboratively with its MACROC council partners and other councils in Western Sydney (e.g. Western Sydney Airport EIS Review).

There is also a case that the chances for successful advocacy will be enhanced if other key stakeholders involved in an issue can collaborate to work towards a common goal, in partnership with Council.

In order to advance the well-being of progressing the future interest of the City of Campbelltown, the General Manager and Director Strategy have more recently been working to strengthen key relationships with groups such as:

- Local Chambers of Commerce
- The Sydney Business Chamber
- Western Sydney University
- National Growth Areas Alliance.

As a result of the community's desire for governments to pay serious attention to the economic and social gains that need to be maximised from the Western Sydney Airport, and at the same time address connectivity challenges across Western Sydney, a new advocacy group has recently emerged called the "Western Sydney Rail Alliance".

Report

The Federal and NSW Governments have recently announced their intention to undertake a joint investigation to define the need, timing and service options for future rail investment to service Western Sydney and Western Sydney Airport. The Federal Government has stated that this project is a key part of its planning for future rail service connections for a Western Sydney Airport. The objectives of the joint scoping study are to:

- determine the rail service needs of Western Sydney from the commencement of operations of a Western Sydney Airport (scheduled for mid-2020s), taking into account the ground transport needs of a Western Sydney Airport, and Western Sydney, generally

- determine the longer term rail service needs of Western Sydney

- identify and consider the broad options to address these rail needs, and recommend the options for more detailed assessment and development.

The joint investigation is expected to take up to 12 months to complete. The scope of the joint study is outlined in Attachment 1. A discussion paper is expected to be released for public consideration during the first half of 2016, and the final report is expected to be completed by the end of this year.

Councils will be invited to make submissions as part of the investigation, through the exposure of the discussion paper mentioned above.

In anticipation of this Federal/NSW Government investigation, the Mayors of Penrith and Liverpool recently hosted a meeting of councils and major stakeholders located in Western Sydney that stand to be potentially benefited by improved rail accessibility.

The meeting was facilitated by Chris Brown of the Western Sydney Leadership Dialogue (and his consultancy Taylor Street Advisory) and Tim Williams of The Committee for Sydney. The meeting was attended by a number of Western Sydney Council representatives including Campbelltown City Council's General Manager, Director Strategy and Director City Works, as well as a range of institutions and private stakeholders in the vicinity of the north-south link proposal.

The meeting discussion focussed on rail options for outer Western Sydney and agreed that a north to south rail line was a major 'game changer' for the region and was an essential item of 'city shaping' infrastructure that went to redress a significant public transport disadvantage that Western Sydney suffers.

All in attendance agreed that there was merit in working collaboratively to advocate the case for the north-south rail link as part of the joint Governments investigation.

Since the meeting, a Steering Committee has been formed to scope the development of a detailed and evidenced based submission to the Federal and NSW Governments. The Steering Committee consists of two stakeholder representatives, two Council (Penrith and Liverpool) representatives and the co-facilitators (Chris Brown and Tim Williams).

Briefs have been developed for three areas –

1. economic, geographic and demographic analysis
2. engineering and technical review, and
3. urban vision.

Responses have been received to the briefs and the Steering Committee is in the process of preparing to appoint the preferred consultants shortly.

The Steering Committee has advised the cost preparing the submission, which is in the order of $300,000. The contribution from each of the participating councils would be $20,000.

If Council is supportive of this report's recommendations and decide to participate in this collaborative advocacy, the $20,000 funding contribution can be addressed as part of the March 2016 quarterly review.

To ensure the appropriate governance and probity controls are in place, Penrith Council has developed a draft Deed that all parties will be required to sign (a list of likely participants is at Attachment 2). This is particularly necessary as the approach involves joint funding and collaboration between councils and the major stakeholders. It is recommended that Council develop its own Deed of Agreement to ensure the appropriate governance and probity controls are in place.

Conclusion

Campbelltown Council's participation in this project will build on our strong collaboration with neighbouring high-growth Western Sydney councils (i.e. Blacktown, Penrith, Camden and Liverpool), which will complement our NGAA partnership, and potentially bring together the representative voices of over one million residents.

It is important for the project to be agreed upon by all the Alliance partners and the contributing organisations confirmed as soon as possible, in order for the consultants to begin their work towards preparation of the submission.

It is recommended that Council endorse Campbelltown's involvement in, and financial commitment to, the preparation of joint submission to the Federal and NSW Government's Rail Scoping Investigations, to be undertaken for the Western Sydney Rail Alliance. It should be noted that information from this joint submission (prepared by specialist consultants) will be able to be used to help inform Council's own submission.

Officer's Recommendation

1. That Council endorse participation in the collaborative approach of the Western Sydney Rail Alliance as outlined in this report, at a cost not exceeding $20,000.

2. That a further report be presented to Council when the technical information from the Alliance's Submission is available, and make a recommendation concerning Council's own submission to the Federal and NSW Governments Joint Investigation.

3. That the matter of Council's funding contribution of $20,000 be referred to the next Quarterly Budget Review.

4. That Council develop a Deed of Agreement to ensure governance and probity controls are in place.

Council Meeting 22 March 2016 **(Brticevic/Lake)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 38

That the Officer's Recommendation be adopted.

Councillor Mead asked for his name to be recorded in opposition to the resolution for Item 10.2 – Western Sydney Rail Alliance.

ATTACHMENT 1

Scope of State and Federal Governments Joint Study

- Review existing plans for developing Western Sydney and a Western Sydney Airport, and the associated forecasts of population growth and aviation demand
- Review existing literature on the assessment of ground transport needs and solutions for Western Sydney and a Western Sydney Airport
- Review existing plans for expanding transport infrastructure to service Western Sydney
- Assess the role rail is likely to play in meeting the future ground transport needs of Western Sydney
- Review the evidence base of customer needs and preferences to determine the characteristics and features that a rail service for Western Sydney needs to be attractive to customers to deliver high levels of customer satisfaction
- Review and recommend the key policy settings to ensure successful integration of this rail service with Sydney's public transport network including Opal Card fares, service type and interchange requirements
- Identify and assess a range of rail service solutions to meet these needs, including different rail connections, travel speeds and train service types. The types of solutions to be considered should include, but not be limited to:
    - extending the existing South West Rail Link,
    - extending other elements of the metro rail network, and
    - developing a dedicated airport express service between a Western Sydney Airport and a key transport hub in the Sydney basin.
- Conduct an initial assessment of the relative benefits and impacts of each option
- Consider funding and financing options, including options for the application of value-capture mechanisms
- Prepare a discussion paper summarising the above reviews and assessments and call for public submissions
- Consider the public submissions and prepare a report that summarises the scoping study findings and recommends next steps.

Governance

The scoping study will be overseen by a Steering Committee co-chaired by:

- Deputy Secretary, the Department of Infrastructure and Regional Development
- Deputy Secretary for Freight, Strategy and Planning, Transport for New South Wales.

The committee will meet on a monthly basis to review the progress of the study. The committee members will include:

- Deputy Secretary, the Department of Infrastructure and Regional Development (Co-Chair)
- Deputy Secretary for Freight, Strategy and Planning, Transport for New South Wales (Co-Chair)
- Executive Director, Western Sydney Unit, the Department of Infrastructure and Regional Development
- Executive Director, Transport Networks, Transport for New South Wales.

ATTACHMENT 2

Likely Participants (to be confirmed)

- Campbelltown City Council
- Liverpool City Council
- Penrith City Council
- Celestino
- Inghams Property
- Lendlease
- Western Sydney University
- Sydney Business Park
- Twin Creeks Golf and Country Club
- Perich Group
- Medich Holdings.

11. REPORT OF DIRECTOR COMMUNITY SERVICES

No reports this round

12. REPORT OF DIRECTOR PLANNING AND ENVIRONMENT

No reports this round

13. REPORT OF DIRECTOR STRATEGY

No reports this round

17. NOTICE OF MOTION

17.1 Local Government Election

Councillors Oates and Brticevic have given Notice in writing of their intention to move the following Motion at the next meeting of Council on 22 March 2016.

> That Council writes to the Minister for Local Government requesting confirmation to conduct the General Election for Campbelltown City Council on the scheduled date in September 2016.

Council Meeting 22 March 2016 **(Brticevic/Oates)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 39

That the Officer's Recommendation be adopted.

17.2 Macquarie Fields House

Councillors Oates and Brticevic have given Notice in writing of their intention to move the following Motion at the next meeting of Council on 22 March 2016.

> That Council writes to the Minister for Environment and Heritage, seeking his support to protect and preserve the historical, environmental, visual and rural landscape and character of Macquarie Fields House and its surrounding lands, by rejecting the current proposed plans for rezoning and subdivision. This would be consistent with the decision of the Land and Environment Court, made in 1999, regarding the Scots College (Winton Property Group's) similar development proposal, which was rejected unanimously by Campbelltown City Council.

Council Meeting 22 March 2016

Having declared an interest in regard to Item 17.2, Councillors Hawker and Lake left the Chamber and did not take part in debate nor vote on this item. In the absence of the Chairperson, His Worship the Mayor, Councillor Hawker, Deputy Mayor, Councillor Matheson chaired the meeting for this item.

Council Meeting 22 March 2016 **(Brticevic/Lound)**

That the Officer's Recommendation be adopted.

Council Resolution Minute Number 40

That the Officer's Recommendation be adopted.

A **Division** was called in regard to the Resolution for Item 17.2 - Macquarie Fields House with those voting for the Motion being Councillors Borg, Brticevic, Chanthivong, Dobson, Glynn, Kolkman, Lound, Oates and Thompson.

Voting against the Resolution were Councillors Greiss, Matheson, Mead and Rowell.

At the conclusion of the discussion regarding Item 17.2, Councillors Hawker and Lake returned to the Chamber for the remainder of the meeting and His Worship the Mayor, Councillor Hawker resumed the Chair.

17.3 Disclosure of Political Donations

Councillor Chanthivong has given Notice in writing of his intention to move the following Motion at the next meeting of Council on 22 March 2016.

1. That a report be presented to the next round of committees on the establishment of a Council public political donations disclosure system for candidates in the upcoming local government election.

2. That this Council public disclosure system is to require all donations (received by individual candidates and groups) to be disclosed within 2 weeks of receipt.

3. That this register of disclosures of donations be made available on Council's website.

Council Meeting 22 March 2016 **(Chanthivong/Glynn)**

1. That a report be presented to the next round of committees on the establishment of a Council public political donations disclosure system for candidates in the upcoming local government election.

2. That this Council public disclosure system is to require all donations (received by individual candidates and groups) to be disclosed within 2 weeks of receipt.

3. That this register of disclosures of donations be made available on Council's website.

LOST

A **Division** was called in regard to the Motion for Item 17.3 - Disclosure of Political Donations with those voting for the Motion being Councillors Brticevic, Chanthivong, Glynn, Kolkman, Lound, Mead and Oates.

Voting against the Motion were Councillors Borg, Dobson, Greiss, Hawker, Lake, Matheson, Rowell and Thompson.

At the conclusion of this item Councillor Glynn retired from the meeting.

17.4 Public Audio Recording of Council Meetings

Councillor Mead has given Notice in writing of his intention to move the following Motion at the next meeting of Council on 22 March 2016.

> That Council give authority under regulation 273 (1) of *the Local Government (General) Regulation 2005* to all persons to use a tape recorder to record non-confidential proceedings of Council meetings.

Council Meeting 22 March 2016 **(Mead/Thompson)**

> That Council give authority under regulation 273 (1) of *the Local Government (General) Regulation 2005* to all persons to use a tape recorder to record non-confidential proceedings of Council meetings.

LOST

A **Division** was called in regard to the Motion for Item 17.4 - Public Audio Recording of Council Meetings with those voting for the Motion being Councillors Greiss, Matheson, Mead, Rowell and Thompson.

Voting against the Motion were Councillors Borg, Brticevic, Chanthivong, Dobson, Hawker, Kolkman, Lake, Lound and Oates.

17.5 Audio Recording and Publishing of Council Meetings

Councillor Mead has given Notice in writing of his intention to move the following Motion at the next meeting of Council on 22 March 2016.

> That Council record the audio of non-confidential parts of Council meetings and publish such audio recording with the minutes of the meeting on Council's website.

Council Meeting 22 March 2016 **(Mead/Greiss)**

> That Council record the audio of non-confidential parts of Council meetings and publish such audio recording with the minutes of the meeting on Council's website.

LOST

A **Division** was called in regard to the Motion for Item 17.5 - Audio Recording and Publishing of Council Meetings with those voting for the Motion being Councillors Greiss, Matheson, Mead, Rowell and Thompson.

Voting against the Motion were Councillors Borg, Brticevic, Chanthivong, Dobson, Hawker, Kolkman, Lake, Lound and Oates.

19. PRESENTATIONS BY COUNCILLORS

19.1 Presentations by Councillors

1. Each Councillor congratulated Mr Nicholas Smolonogov on his impending retirement and for his service and achievements during his time with Council. Councillors thanked Mr Nicholas Smolonogov for his friendship, compassion, guidance, impartiality, integrity and unwavering support and noted that his commitment to the City of Campbelltown and our community is unparalleled and that the Campbelltown Local Government Area has been fortunate to have benefited from his service.

   Mr Nicholas Smolonogov addressed Councillors and thanked them for their kind words. He also thanked all staff for their support, in particular Mrs Judith Loomes.

2. Councillor Thompson thanked City Works staff on their efforts in maintaining all parks and soccer fields in the Local Government Area.

3. Councillor Mead referred to the Facebook page 'Halal Snack Pack Appreciation Society' noting the recent parliamentary speech by Labor Senator, Sam Dastyari regarding his recent visit to the King Kebab House in Campbelltown describing it as the 'mecca of halal snack packs'. Councillor Mead acknowledged the recognition that this was bringing to local businesses in Campbelltown.

4. Councillor Greiss noted the recent attendance of several Councillors at Council's Ingleburn Alive event noting the success of the day and thanking staff for the program of events.

RESOLUTIONS FROM THE CONFIDENTIAL SECTION OF THE ORDINARY MEETING OF COUNCIL HELD 22 MARCH 2016

Confidentiality Recommendation

It was **Moved** Councillor Greiss, **Seconded** Councillor Lake that the Council in accordance with Section 10A of the *Local Government Act 1993,* resolve to exclude the public from the meeting during discussions on the items in the Confidential Agenda, due to the confidential nature of the business and the Council's opinion that the public proceedings of the Committee would be prejudicial to the public interest.

Planning and Environment Committee

21.1 Confidential Report Directors of Companies

Reason for Confidentiality

This report is **CONFIDENTIAL** in accordance with Section 10A(2)(c) of the *Local Government Act 1993*, which permits the meeting to be closed to the public for business relating to the following: -

(c) information that would, if disclosed, confer a commercial advantage on a person with whom the council is conducting (or proposes to conduct) business.

Council Meeting 22 March 2016 (Lake/Borg)

That the information be noted.

Council Resolution Minute Number 43

That the information be noted.

CARRIED

21.2 Heritage Medallion 2016

Reason for Confidentiality

This report is **CONFIDENTIAL** in accordance with Section 10A(2)(d) of the *Local Government Act 1993*, which permits the meeting to be closed to the public for business relating to the following: -

(d) commercial information of a confidential nature that would if disclosed:

(iii) reveal a trade secret.

Council Meeting 22 March 2016 (Rowell/Greiss)

1. That Council note the information on the nominations received for the 2016 Heritage Medallion.

2. That Council endorse the recommendation of the Heritage Protection Sub Committee and award the 2016 Heritage Medallion jointly to Campbelltown Public School and St Patrick's College

3. That Council endorse the recommendation of the Heritage Protection Sub Committee and issue the award of Highly Commended to Mr David Vassallo and the Campbelltown Veteran's Recreation Centre

Council Resolution Minute Number 43

1. That Council note the information on the nominations received for the 2016 Heritage Medallion.

2. That Council endorse the recommendation of the Heritage Protection Sub Committee and award the 2016 Heritage Medallion jointly to Campbelltown Public School and St Patrick's College

3. That Council endorse the recommendation of the Heritage Protection Sub Committee and issue the award of Highly Commended to Mr David Vassallo and the Campbelltown Veteran's Recreation Centre

CARRIED

City Works Committee

No reports this round

Community Services Committee

No reports this round

Corporate Governance Committee

24.1 Licence Agreement for Campbelltown Camden District Band Incorporated

Reason for Confidentiality

This report is **CONFIDENTIAL** in accordance with Section 10A(2)(c) of the *Local Government Act 1993*, which permits the meeting to be closed to the public for business relating to the following: -

(c) information that would, if disclosed, confer a commercial advantage on a person with whom the council is conducting (or proposes to conduct) business

Having declared an interest in regard to Item 24.1, Councillor Kolkman left the Chamber and did not take part in debate nor vote on this item.

Council Meeting 22 March 2016 (Thompson/Borg)

1. That Council enter into a licence agreement with Campbelltown Camden District Band Incorporated over Part of Lot 107 DP 777358 as outlined in the report.

2. That all documentation associated with the licence agreement be executed under the Common Seal of Council, if required.

Council Resolution Minute Number 43

1. That Council enter into a licence agreement with Campbelltown Camden District Band Incorporated over Part of Lot 107 DP 777358 as outlined in the report.

2. That all documentation associated with the licence agreement be executed under the Common Seal of Council, if required.

CARRIED

At the conclusion of the discussion regarding Item 24.1, Councillor Kolkman returned to the Chamber for the remainder of the meeting.

CONFIRMATION OF COUNCIL'S ORDINARY MEETING MINUTES

At the Council Meeting held 19 April 2016 the following Council minutes were adopted:

There being no further business at the meeting of 22 March 2016, the meeting closed at 9.52pm.

Confirmed by Chairperson:

There being no further business at the Extraordinary meeting of 29 March 2016, the meeting closed at 7.10pm.

Confirmed by Chairperson: