Mr Paul Robilliard  
Director Housing Land Release  
Department of Planning and Environment  
By email at: community@planning.nsw.gov.au

Dear Mr Robilliard

Public Exhibition Riverstone East Stage 1

Reference is made to your correspondence dated 14th August 2015, to the Office of Environment and Heritage (OEH) inviting comment on the draft Riverstone East Precinct Stage 1

Comments are provided in Attachment 1. These include advice on the background studies for transport and bushfire as they relate to the Rouse Hill Regional Park as these documents form part of the exhibition materials. Comments are also included on visual impacts from the Rouse Hill Historic House and its curtilage.

Main recommendations are to:

- Retain more existing native vegetation (ENV) for visual amenity and environmental, and climate adaptation reasons.
- Review mapped ENV areas and calculations to ensure areas identified for protection are large enough to be viable and can be counted toward the 2,000 hectare target.
- Reconsider R3 zonings in a number of locations (such as the area south of the E3 land, adjoining RE1 along Clarke Street and next to the RE1 land along Cudgegong Road) where there are incompatible adjoining land uses.
- Consider the visual amenity issues relating to the historic Rouse Hill House and its curtilage particularly building density and heights and retention of vegetation along ridgelines and high points in the landscape.
- Revise the Transport Report to include an adequate consideration of the Guntawong Road crossing, and to improve the planned pedestrian and cycle ways including linking to the new train station and the regional park.
- Revise the Bushfire Report to include references to the future revegetation of the Rouse Hill Regional Park including the need for asset protection to be outside the park boundaries and standard cross sections where land adjoins the park.
- Consider mechanisms to increase green cover within the precinct including specific Development Control Plan (DCP) provisions.
- Update the recommended and undesirable plant lists in the Blacktown DCP.
If you require further information or clarification on these matters please contact me by email at susan.harrison@environment.nsw.gov.au

Yours sincerely

S. Harrison 24/09/15

SUSAN HARRISON
Senior Team Leader Planning
Greater Sydney
Attachment 1. Office of Environment and Heritage (OEH) comment on the draft Riverstone East Precinct.

1. Biodiversity

1.1 Existing Native Vegetation (ENV) Protection Targets

The Biodiversity Consistency Stage 1 and Stage 2 Reports (BCRs) provide an assessment of how the precinct zones and development controls will address the relevant biodiversity measures (RBM) that underpin the Growth Centres Biodiversity Certification. The draft Growth Centres Conservation Plan identified 14.6 hectares of Existing Native Vegetation (ENV) would need to be retained within the entire Riverstone East precinct in order to maintain parity with the 2000 hectare requirement (RBM 6).

As summarised in the table below, a total of 4.3 hectares is required to be protected within Stage 1 to maintain parity and a total of 6.6 hectares of field validated ENV has been identified to be retained and protected. Within Stage 2 a total of 1.7 hectares of field validated ENV has been identified to be retained and protected. When Stage 1 and Stage 2 targets are combined the amount identified to be protected is 8.3 hectares. A total of 14.6 hectares need to be retained and protected for the entire precinct to maintain parity.

Table 1. Summary of ENV Protection Areas

<table>
<thead>
<tr>
<th>Riverstone Precinct</th>
<th>East</th>
<th>ENV Target for Parity with the draft Conservation Plan</th>
<th>ENV identified to be protected in Biodiversity Consistency Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>4.3</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>Stage 2</td>
<td>3.2</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Further stage</td>
<td>7.1</td>
<td>Not known at this stage</td>
<td></td>
</tr>
<tr>
<td>Total precinct</td>
<td>14.6</td>
<td>Not known at this stage</td>
<td></td>
</tr>
</tbody>
</table>

OEH is concerned about the future ability to retain sufficient protected ENV within the Growth Centres, and particularly in the North West (NW) Growth Centre, in order to meet the 2,000 hectare target. The Riverstone East Precinct is one of the few remaining unplanned precincts in the NW sector so opportunities for protection are now very limited.

Biodiversity management recommendations in Biodiversity and Riparian Corridor Assessment Report (BRCAR) by EcoLogical Australia (ELA) (April 2015) include to "maximise retention of ENV and AHCVV within certified lands and plan for the location of conservation reserves, public open space, visual buffers and other passive land uses in these areas". Figure 7 in the BRCAR identifies a significant amount of 'moderate' to 'good' condition ENV in the precinct. Although most of this is in currently certified land, the protection of only 8.3 hectares out of the total 105 hectares of validated ENV is disappointing. Similarly with the additional high conservation value vegetation (AHCVV) (21.5 hectares in Stage 1 and 9.6 hectares in Stage 2) only a very small area has been identified to be protected (1.7 hectares in Stage 1 and 0 hectares in Stage 2).

The BRCAR further suggested "... in addition to non-certified areas, land uses surrounding detention basins, riparian corridors and parks will need to be carefully managed in order to appropriately manage the ecological integrity of the precinct. Opportunities to maximise ecological values across the site will also be available through the rehabilitation and revegetation of detention basins and the potential for retention of remnant vegetation in areas zoned for public or private open space, drainage and education infrastructure, and possibly environmental conservation and environmental living".

OEH acknowledges that changes to Section 94 contributions have limited the use of developer contribution funds and no longer allow for land to be purchased for conservation purposes. More recently the NSW Government's decision to remove Sydney Water as the acquisition authority for flood prone land at North Kellyville has reduced opportunities for a public ownership outcome. These changes make it increasingly difficult to achieve the preferred OEH hierarchy for ENV protection (i.e. ENV in public ownership with a conservation zoning).
As the annual reporting on vegetation clearing prepared for the Department of Planning and Environment shows clearing of ENV is occurring in non certified areas despite vegetation protection measures. As development pressures accelerate, and more infrastructure impacts occur resulting in loss of non certified ENV, it will become increasingly difficult to find adequate areas of ENV that can be retained including to offset infrastructure losses. There are also many broader environmental, urban and visual amenity, and climate adaptation reasons for retaining as much existing native vegetation as possible. These issues are discussed further below.

1.2 Field validations and mapping of protected ENV

OEH does not consider the ENV protection areas have been adequately identified. For example, the figures for ground-truthed ENV in the BCRs (p 21) include small and isolated patches. These appear to be less than 0.5 hectares in size and would not meet the definition of ENV. The larger areas of ENV should be mapped as more ‘rounded’ and inclusive areas rather than be too finely articulated in order to maintain a better area to edge ratio and make the retained ENV areas easier to identify and protect on the ground.

The mapping of Native Vegetation Protection (NVP) areas in the BCRs is not consistent with the proposed SEPP Native Vegetation Protection Map. For example, areas of ENV are included in the Stage 2 BCR map north of Cranbourne Street are not in the NVP Map. It is therefore questioned if the calculations for retained ENV in the BCRs are correct.

In another example the linear section of mapped ENV near Oak Street in the NVP Map is not consistent with field validated ENV. The vegetation appears to be a row of trees only and the original mapped ENV did not extend into the southern property. It appears that part of this area was intended to be AHCVV but this has not been clearly mapped. Even when this error is corrected, OEH questions whether this would meet the minimum 0.5 hectare size in the ENV definition and suggests this area should not be counted toward the target as it is too small and linear to be able to be adequately retained and protected in the future.

A further example is the area of ENV bisected by the unmade section of Cranbourne Street. It appears that this road will not be continued to join up with Clarke Street. If it will be a formed road in the future, the NVP Map should be amended to remove both the section with the road and the small section to the north.

These and other examples are illustrated in the Attachment 2.

1.3 Protection of ENV and proposed zonings

OEH also does not consider the provisions proposed in accordance with the relevant RMBs for ENV protection are adequate. The BCRs state that ENV will be protected through the application of an SP2 and RE1 zoning and the NVP development control in the SEPP. OEH has concerns about the adequacy of these controls as well as the zoning outcomes and proximity to future development areas.

For example, most of the protected ENV areas are located adjacent to future R3 Medium Density Residential areas. An R3 medium density residential zone is also proposed adjacent to the one E3 Environmental Management zoned site (private conservation land) in the precinct. An R3 zone is also proposed for land to the east of the E3 land. These two lots are currently well vegetated. The location of four blocks of R3 zoned land between Clarke Street and First Ponds Creek will create pressures on the open space areas with inadequate space for buffer areas or adequate widths for the range of activities that are expected to be undertaken alongside this area such as pedestrian and bike pathways, passive recreational space and stormwater infrastructure. The R3 zones are not a compatible land use next to areas where ENV is to be retained without the provision of buffer areas.

It is considered unlikely that the area of ENV along the extension of Clarke Street toward Schofields Road will be protected as mapped as it does not provide any buffer area to the roadway. The road construction itself and the likely need for road batters will mean that ENV along the road boundary would be impacted. A buffer area to the protected ENV needs to be provided.
For the ENV to be retained east of Oak Street, Figure 6 titled Aerial artists perspective of Riverstone East Precinct in the Land Use and Infrastructure Delivery Plan appears to show a watercourse through the area of protected ENV. Also this patch of ENV has two farm dams within it that may need to be decommissioned. It is questioned how effectively ENV identified to be retained will be protected in this instance.

OEH notes there is one area south of Garfield Road proposed to be zoned E4 Environmental Living. It is not clear why an E4 zoning is proposed for this location as the land has not been identified as containing any significant vegetation communities although one hollow bearing tree is mapped within the site. The E4 zoning is unlikely to protect this tree although inclusion of this area in the RE1 zone could. With the diversion of Clarke Street, a greater area for open space could deliver a better conservation outcome by providing a buffer to the riparian protection area, noting that it does not appear to be an adequate width at this point.

2. Riparian Corridors and the Riparian Protection Area

The BRCAR recommends the precinct plan seek to maintain or recreate a vegetated riparian zone with fully structured native vegetation in accordance with the riparian corridor requirements with minimal disturbance and harm to the recommended riparian corridor.

Specific riparian and aquatic design considerations in the BRCAR included:
- Adequate riparian protection areas along First Ponds Creek, with co-location of water treatment/detention facilities to maintain or increase the effective riparian corridor width.
- Minimising the number of creek crossings and providing a perimeter road separating development from the riparian corridor / vegetated riparian zone.
- Embellishment of existing native riparian and aquatic vegetation and restoration of the aquatic habitat of the watercourses as part of a riparian corridor management plan.
- Integration of groundwater dependant ecosystems (GDEs) as part of the broader riparian corridor network within the precinct.
- Incorporation of open space within areas of higher aquatic habitat quality where possible, or creation of new wetland and aquatic habitat to replace areas lost for infrastructure.
- Use of local provenance wetland species for detention basin design with specific consideration of establishing suitable wetland/aquatic habitat.
- Appropriate use of large woody debris to reintroduce instream habitat.
- Control of peak flows to reduce erosion impacts and improve water quality through the implementation of water sensitive urban design.
- Design and placement of sewer infrastructure to reduce the potential impact of overflows within riparian environments.

The Riparian Protection Area Map does not provide a consistent corridor width for the First Ponds Creek. As a 3rd order watercourse the total riparian corridor should be 60 metres wide plus channel width. It does not appear that the riparian corridor is consistently this width along the length of First Ponds Creek. For example, between Cranbourne Street and Riverstone Road the plan does not achieve the required corridor width. In the section north of Garfield Road the riparian corridor does not include any protection for the eastern side of the watercourse, although this may be planned in a future stage.

Part of the precinct is mapped as being non certified land subject to RBM 18. Although no further work is required to satisfy RBM 18 for the Green and Golden Bell Frog (Litoria aurea) the BRCAR suggests design elements of a Water Cycle Management Strategy could include suitable habitat for the Green and Golden Bell Frog within the riparian corridor of First Ponds Creek. Basin 2 could be designed to provide suitable habitat but has not been at this stage.

The patches of potential ground dependent ecosystems (GDEs) within the study area are generally located along System G (Figure 12), which is of high conservation significance, therefore the proposed rezoning presents an opportunity to recognise and enhance these important environmental features as a component of the broader riparian network of the precinct. It is therefore recommended
that where possible these areas of vegetation be retained and appropriately integrated with the ILP and future urban development. If groundwater extraction is proposed as any part of future development proposals, impacts on these GDE’s would need to be further assessed.

While fragmented landownership may constrain the development of suitable riparian corridors in some parts of the precinct, proposed detention basins should result in sections of land along the riparian corridors with detention basins being revegetated and rehabilitated and retained in public ownership. These areas could provide potential habitat for fauna and strengthen habitat connectivity.

The *Water Cycle Management Report* by Mott MacDonald (April 2015) includes detailed engineering plans for the various detention basins but does not provide details on planting or a plant schedule. The report suggests the use of local provenance species for revegetation and weed management will be important in these areas to ensure ecosystem functionality is maximised and downstream impacts are minimised. Vegetation management plans for these areas will be need to be prepared to the satisfaction of NOW/OEH.

### 3.0 Visual amenity from Rouse Hill House and Rouse Hill Regional Park

The *Riverstone East Landscape & Visual Assessment Report* (PLACE Design Group September 2014) states “A significant part of the Riverstone East Precinct falls within a defined catchment called the Visual Heritage Curtilage of one of Australia’s most significant historical rural homesteads, Rouse Hill House and the surrounding Rouse Hill Regional Park”. This assessment and the earlier *Area 20 Landscape and Visual Analysis including Rouse Hill Estate Curtilage* report by Conybeare Morrison (2010) identified the importance of the vista from the historic Rouse Hill House and surrounds to the historic significance of the site.

The PLACE report identifies the importance of the Cumberland Plain and Alluvial Woodland vegetation communities within the precinct in providing effective landscape and visual buffers, recommending all efforts be taken to retain and strengthen the woodland character of the site to assist in mitigating the effects of future development in and around the Rouse Hill estate. Figure 2 in the PLACE report identified the high ridgeline areas and high points within Area 20 and Riverstone East precincts. The report recommended woodlands located along the ridge lines be retained and, where circumstances permit, further enhanced.

As OEH has previously commented the precinct plan should ensure that the visual amenity from Rouse Hill House and its curtilage is not compromised by the future rezoning of land in the precinct and consequent loss of vegetation. No visual analysis appears to have been undertaken for Stages 1 and 2 of the Riverstone East precinct and no reference is made to the PLACE study. OEH considers that there should be a visual impact assessment for all rezoning proposals in Riverstone East and Area 20 to consider the Rouse Hill Regional House and curtilage visual impacts.

The visual amenity relies on screening of elements such as the transmission easement with retained trees and buffer planting. The report particularly recommends the existing ridge line Cumberland Plain Woodland (CPW) be retained to maintain ridge line to 75 metres south west of transmission easement (Figure 5 p10 PLACE Report).

Key measures identified in the 2010 report (that were supported in the later report) included:
- Retention of vegetation in visually sensitive areas
- Strategically locating parks at high points
- Additional planting in widened road reserves

In addition, the PLACE report recommended that the tracts of land adjoining the Cudgegong Reserve to the north east bound by Cudgegong Road and to the south west be retained as vegetated.

The exhibited documents (including the Stage 3 Indicative Layout Plan Working Draft) instead propose rezoning from R2 to R3 and RE1 in part of Area 20, R2 along the ridge line in Stage 1 and in the Stage 3 plans. The ridge lines and prominent high points in the precinct are locations where R3 Medium Density Residential is proposed with building heights ranging from 9-12 metres (and to 14 metres for the B2 Local Centre site. This is contrary to the recommendation within the Visual Analysis
that the western edge of the large lots zoned in the Area 20 Precinct be typical low density lots to minimise the visual impact on the Rouse Hill House Estate.

The PLACE report suggests controls to retain existing significant trees and new landscape planting on public and semi-public spaces are needed. The Blacktown City Council Development Control Plan (DCP) states that "native trees and other vegetation are to be retained where possible by careful planning of subdivisions to incorporate trees into areas such as road reserves and private or communal open space". The new estates and subdivisions now being built in the NW and SW Growth Centres do not demonstrate that this principle is being well addressed.

OEH recommends that the vegetation on both sides of the transmission line be retained and protected with an E4 Environmental Living or R2 Low Residential zone rather than R3. While the RE1 zoning in Area 20 could allow for retention of vegetation along the eastern edge of the transmission line along Cudgegong Road, the PLACE report also recommended screening along the western side of the transmission line and a low density subdivision to the north-west ridge line of Area 20.

The connectivity of vegetation would be enhanced if there was no SP2 zoned local road along the northern boundary of Cudgegong Reserve as zoned in the Area 20 precinct. Given this directly adjoins the other Area 20 land that is to be rezoned, this is an opportunity to remove the local road and enhance the connectivity between areas of reserved land. Macquarie Road to the north also cuts through the RE1 area. Given the small size of these areas this can provide better conservation outcomes as well as enhanced recreational opportunities.

4.0 Bushfire Assessment

OEH has already noted that the Bushfire Assessment does not consider the future revegetation and landscape plans for the Rouse Hill Regional Park (RP). This report needs to be updated to incorporate the future revegetation plans for the RP and ensure asset protection will be established outside the park boundaries. No asset protection should be required within the current and future Rouse Hill RP boundaries.

5.0 Transport Issues

OEH has previously commented on the Transport Study for Riverstone East, noting that the future Rouse Hill RP will be a very significant visitor destination within north-west Sydney. Although reference is now made to the RP as a key land use in the report introduction there is little indication that is has been considered throughout the report and it is not identified in the key mapping. OEH therefore retains its advice that this plan does not adequately consider the transport needs for future visitors to the Rouse Hill RP. A major use that needs to be included in the planning is to provide for simple and safe pedestrian and cycle access from the train stations at Rouse Hill and Cudgegong Road to the RP.

5.1 Gunta Wong Road and Rouse Hill RP

The Transport Study considers the possible closure of Gunta Wong Road (p 31). The traffic modelling finds that closing the road would result in a significant deterioration in road network performance. In the report Gunta Wong Road is identified as a ‘collector’ road with a typical cross section of two lanes plus parking lanes giving an overall width of 18-20 metres. Collector roads are described as carrying a higher volume of traffic, linking neighbourhoods and centres and accommodating public transport routes. Amenity and safety is to be maintained by restricting vehicle speeds through traffic-calming measures and intersection design. Intermittent parking with landscaping is provided on both sides of the street.

However, Gunta Wong Road is the only east west road link in the precinct, and forms a major direct link for the Riverstone precinct to Windsor Road. Given the traffic pressures on the other east west links for Schofields Road to the south and Garfield Road to the north of the precinct, it is considered unlikely that this can remain a ‘collector’ road in the future. Also with a 1,000 carpark facility at the new Gunta Wong Road Station, traffic will obviously use this east west link from Cudgegong Road to Windsor Road. This will undermine the ability for traffic calming and road narrowing measures to be
maintained in the future. Given these pressures OEH is disappointed that there has not been further exploration of the ‘cut and cover’ option that has been identified at several meetings with DPE.

As previously expressed, OEH strongly desires a connected land bridge across the roadway to provide an uninterrupted cycleway/pedestrian access as well as a landscape linkage that will facilitate fauna movements from one part of the park to another. As has been discussed OEH considers that options should be investigated including cost estimates for Guntawong Road including a full cut and cover option at least 3 metres in width. OEH recommended that the Transport Study include a discussion of these options and provide a preferred option with a cross section of the roadway to demonstrate how this section of the road will provide traffic calming, safe pedestrian and cycleway crossings and fauna linkages.

Unfortunately the report merely suggests that alternatives “may be considered to improve north-south connectivity through the regional park across Guntawong Road include provision of a pedestrian bridge, an at grade zebra crossing or a land bridge associated with cut and cover of a 3 metre section of road”. This is not considered an adequate response to an issue that OEH considers to be highly important for the future management and recreational values of the regional park.

5.2 Bus routes

As commented previously the future bus servicing strategy needs to consider visitors to the regional park. OEH recommends a closer route to the western entrance of the Rouse Hill RP with indicative bus stops near park entry points. According to Figure 26 Route D7 now appears to run along Worcester Road but this could be more clearly articulated. Mapping the location of the current extent and future extension to the RP as well as a discussion of this route to facilitate public transport access would assist in clearly identifying the need for this bus servicing for the park.

5.3 Cycleways and pedestrian paths

The Transport Study states that walking and cycling will play an important role in meeting future transport needs for the precinct. The off-road cycleways depicted in the draft report are considered inadequate for this. OEH recommends that connected shared pedestrian cycleways linking the Rouse Hill RP to major destinations such as Riverstone and Cudgegong Road train stations and Rouse Hill town centre be a key feature of the traffic strategy.

The report refers to a network of bicycle paths to be provided within Rouse Hill RP but states the location and scale of the shared path network will be determined by OEH. As OEH has previously stated, it is the intention that the regional park will provide unencumbered parkland areas within a ring system of walking and cycling tracks, allowing pedestrians and cyclists to traverse the whole of the park without having to negotiate traffic. It is planned that the parklands will be substantially revegetated with native plantings with a network of open grassed areas with pedestrian and cycleways throughout and several vehicle access points with car parking areas.

The pedestrian cycle network does not appear to consider any linking of parks and recreational areas. Despite mentioning linkages to key land uses such as Cudgegong Road railway station, Area 20 town centre, Rouse Hill RP, schools and open space areas Figure 29 Future Cycling and Pedestrian Network shows only pedestrian and cycle routes following the main roads with some signalised crossings and pedestrian refuges. More desirable routes are possible that could provide cycle and pedestrian opportunities without the need for crossing numerous roads. For example, a linkage between the train station and Rouse Hill RP along the open space network in Area 20 would be desirable and service the visitors to the park and encourage the use of public transport, including by bicycle. Also, there are opportunities to link open space areas along Second Ponds Creek to the train station as part of a broader cycleway.

OEH previously advised it would support a shared pedestrian and cycle path which links the existing Gordon Road within Riverstone, across First Ponds Creek into the Riverstone East precinct. This path would provide a connection to Cudgegong Road railway station and the Area 20 town centre. There would be benefit in considering how this could link to the Rouse Hill RP cycleways to provide a longer, uninterrupted cycleway. Now that the Heavy Rail Stabling Yard is being located in the
industrial zoned land along Schofields Road, the location for the pathway needs to be reconsidered. OEH recommends consideration be given to this along the southern edge of the RE1 land but with a greater area of RE1 land and better connection for the vegetated areas as discussed in Section 6.

Action 3.2.1 in A Plan for Growing Sydney is to deliver the Sydney Green Grid Project. This aims to build an open space network to connect homes to centres, public transport, jobs and recreation. It also aims to include open spaces, bushland, natural areas, waterway corridors and tree lined landscapes. OEH recommends greater consideration be given to implementing a green grid approach across the Growth Centres, incorporating pedestrian and cycleways, and in this instance through improvements to the Traffic Study and proposed zones.

6.0 Climate Change Adaptation and Green Cover Guidelines

Recent climate modelling shows that Western Sydney will be impacted by more hot and extreme temperature days in the near future. Maximum temperatures are projected to increase in the Greater Sydney Metropolitan Region by 0.7°C in the near future and up to 1.9°C in the far future. Minimum temperatures are projected to increase by 0.6°C in the near future up to 2°C in the far future (see http://www.climatechange.environment.nsw.gov.au/Adapting-to-climate-change/Regional-vulnerability-and-assessment).

The Metropolitan Sydney Region is expected to experience more hot days in the near future and in the far future. The greatest increase is projected for Western Sydney and the Hawkesbury with an additional 5–10 days in the near future, increasing to over 10–20 additional hot days per year by 2070. For the Riverstone area specifically, the change in temperature in 2060-2079 is predicted to be +1.96 °C with a change in the number of days a year with a maximum temperature > 35°C over +12 days. Increased maximum temperatures are known to impact human health through heat stress and increasing the number of heatwave events. Increased overnight temperatures (i.e. minimum temperatures) can also have a considerable effect on human health.

OEH has produced the Urban Green Cover in NSW Technical Guidelines (see http://www.climatechange.environment.nsw.gov.au/Adapting-to-climate-change/Green-Cover). The purpose of the guidelines is to increase the resilience of NSW settlements and communities to climate change, specifically to increasing temperatures in urban settings. They provide best practice technical guidance for creating green cover in urban environments. Increased green cover (i.e. trees and vegetation) will reflect heat and cool and clean the air by evapo-transpiration. Other community benefits are better health and wellbeing, greater biodiversity and visual amenity, and regulation of localised flooding.

Key strategies for increasing green cover in urban areas were identified as being:

- Cool Roofs - green roofs and light coloured and reflective roof surfaces
- Cool Walls - green walls and shaded walls
- Cool Pavements - reduced hard surface area, permeable pavements and light coloured, high albedo (highly reflective) pavements
- Cool Streets - opportunistic street tree planting with shade providing canopy, mass planting understorey, bio-swales and median planting
- Cool Carparks - canopy tree plantings, median planting and bio-swales, permeable pavement
- Cool Canopies - increased canopy trees and shade provision to parks, cycleways, footpaths, amenities and forecourts and shade structures, including structures covered with climbing plants
- Green Infrastructure - bio-swales, rain gardens, soft landscaped detention basins, de-channelisation of hard engineering (concrete culverts).

There is greater opportunity for consideration of green cover as part of the Riverstone precinct planning process. OEH recommends the above measures be incorporated into the Blacktown City Council Development Control Plan (DCP) to enhance the sustainability guidelines and controls.

Appendix D titled Table 1 Prescribed Trees and Preferred Species in the Blacktown DCP currently provides a list that contains many species that are either not native, known to be a weed or
undesirable species in Western Sydney or that are not endemic to the area. This list should be considerably revised to remove unsuitable plants and include a greater range of local native species that could be planted in the area. Consultation with Blacktown City Council is recommended to either revise this list or alternatively to refer to the information on Council’s website under http://www.blacktown.nsw.gov.au/Environment/Land_Biodiversity/Native_vegetation. The Table 2 list titled Undesirable Species should also be amended and updated to include other known weed and invasive species. Changes to this list are suggested in Attachment 3.

7.0 Aboriginal Cultural Heritage

OEH previously advised that a program of test excavations should take place prior to re-zoning, in order to ensure conservation outcomes were secured for this precinct. It appears that this testing program has not taken place and as a result, the proposed zonings for this stage of the precinct do not appear to contain any conservation outcomes for Aboriginal Cultural Heritage.

The predictive modelling map on page 83 of the draft Aboriginal Cultural Heritage Assessment Report (ACHAR) indicates that there is an area of high archaeological probability in the south west of the precinct, in an area to be zoned IN1 General Industrial. This zoning does not allow for conservation of Aboriginal objects. Further areas identified as having moderate-high archaeological probability, including an area identified as the A7 complex, running along the western boundary of the precinct, have been zoned SP2 Infrastructure and RE1 Public Recreation. Again, neither zoning is compatible with any form heritage conservation.

In effect, these zonings mean that any Aboriginal heritage values in these areas are likely to be destroyed by the proposed development. It is frustrating that the opportunity to strategically secure some genuine conservation outcomes for Aboriginal cultural heritage has not been taken in this precinct.

8.0 Flood Risk Management

OEH has previously reviewed and commented on the Water Cycle Management Report (Mott MacDonald, September 2014). OEH considers that the current version of the Water Cycle Management Report (Mott MacDonald, April 2015) contains no new information to address our concerns. Consequently OEH’s comments remain as previously provided.

OEH highlights that it is prudent to consider the developed scenario for the upstream Alex Avenue Precinct for flood events larger than the design flood (i.e. the 100 year ARI) up to the PMF for the following reasons:

· To adequately address the risk within the proposed Riverstone East Precinct during flood events larger than the capacity of the proposed management measures/ basins within the upstream Alex Avenue Precinct.

· To appropriately identify flood prone land within the proposed Riverstone East Precinct (i.e. PMF extent). The PMF extent for the ultimate developed scenario along First Ponds Creek line provides an upper limit of flooding and associated consequences. It would inform emergency response planning to ensure safety of existing and future communities.

END OF SUBMISSION