Biodiversity Assessment report

Modification to Calderwood Part 3A Concept Plan

Prepared for
Lendlease Communities Pty Ltd

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DOCUMENT TRACKING

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Project Manager	Dr Meredith Henderson Suite 204, level 2 62 Moore Street Austinmer NSW 2515 02 4201 2211
Prepared by	Alex Gorey
Reviewed by	Meredith Henderson
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Abbreviations

Abbreviations	Description
BC Act	*Biodiversity Conservation Act 2016*
BOS	Biodiversity Offset Strategy
DCP	Development Control Plan
DotEE	Commonwealth Department of the Environment and Energy
DP&E	Department of Planning and Environment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FM Act	*Fisheries Management Act 1994*
LEP	Local Environment Plan
LGA	Local Government Area
NP&W Act	*National Parks and Wildlife Act 1974*
NRAR	Natural Resources Access Regulator
NV Act	*Native Vegetation Act 2003*
SEARS	Secretary's Environmental Assessment Requirements
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TSC Act	*Threatened Species Conservation Act 1995*
VMP	Vegetation Management Plan
WM Act	*Water Management Act 2000*

Executive summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Lendlease Pty Ltd to prepare a Biodiversity Assessment of the proposed modification to the Approved Concept Plan for the Calderwood Urban Development Project. Lendlease propose to increase the density of residential dwellings from approximately 4,800 to approximately 6,500 across the subdivision area (study area). The following report assesses whether the changes to the concept plan are consistent with the Secretary's Environmental Assessment Requirements issued by the Department of Planning and Environment (MP 09_0082 MOD 4). This report specifically addresses the SEARs 7 and 8 relating to Riparian Impacts and Biodiversity respectively.

This report considered potential additional impacts to threatened ecological communities, flora, fauna and migratory species listed under the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) either known or considered likely to occur in the study area. The report addresses potential additional impacts on riparian areas, watercourses and ecologically sensitive areas.

The modified plan was assessed against the Approved Concept Plan to determine whether any additional impacts were likely to occur. The assessment concluded that the new Plan would not result in additional impacts to threatened ecological values within the study area.

The stages still requiring the submission of a development application to Shellharbour City Council or Wollongong City Council were assessed against the potential to trigger the Biodiversity Offsets Scheme under the BC Act. Some stages will trigger the scheme. Biodiversity offset requirements would be addressed at the development application stage.

1 Introduction

This Biodiversity Assessment accompanies an Environmental Assessment Report (EAR) for a proposed S75W Modification Application to the Calderwood Concept Plan Approval (MP09_0082) (Approved Concept Plan) for the Calderwood Urban Development Project (CUDP).

A modification is sought to the Approved Concept Plan to allow for increased and more diverse housing supply at Calderwood. The increase in housing supply is proposed to ensure that the existing area of urban zoned land at Calderwood is efficiently used for the continued supply of a range of housing types and sizes that both meet market demand and will assist address housing affordability pressures in the Illawarra region.

1.1 Site description

The CUDP site is located within the Calderwood Valley in the Illawarra Region. It is approximately 700 hectares in area with approximately 107 hectares of land in the Wollongong LGA (15%) and the balance in the Shellharbour LGA (85%). An aerial photograph of the site is provided at **Figure 1**.

Calderwood Valley is bound to the north by Marshall Mount Creek (which forms the boundary between the Shellharbour and Wollongong LGAs), to the south by the Macquarie Rivulet, to the south-west by Johnston's Spur and to the west by the Illawarra Escarpment. Beyond Johnston's Spur to the south is the adjoining Macquarie Rivulet Valley within the locality of North Macquarie. The CUDP site extends south from the intersection of North Marshall Mount Road and Marshall Mount Road to the Illawarra Highway.

1.2 Project Background

Lendlease is the proponent of the CUDP. On 8 December 2010 the Minister for Planning determined (with modifications) the Approved Concept Plan. Following approval of the Concept Plan, on 14 January 2011 Schedule 3 of State Environmental Planning Policy (Major Development) 2005 (now the State Significant Precincts SEPP) was amended to establish zoning and other planning controls for the CUDP.

The Approved Concept Plan comprises the plans, drawings and documents cited by the proponent in its Environmental Assessment, Preferred Project Report and Statement of Commitments, subject to the modifications and further assessment requirements set out in Schedule 2 of the Concept Plan notice of determination. A Consolidated Concept Plan was prepared in March 2011 that includes the approved Concept Plan documentation.

Together, the planning controls at Schedule 3 of the State Significant Precincts SEPP and the Approved Concept Plan establish the statutory planning regime for the development of the CUDP.

The Approved Concept Plan provides for the development of a total of approximately 700 hectares of land. Relevantly, Condition A1(1) of Schedule 2 of the Concept Plan determination states that approval is granted to the carrying out of development of approximately 4,800 residential dwellings and 50 ha of mixed use employment land, open space and protection of environmentally significant lands, internal roads, service infrastructure and community facilities (including three schools). The approved Calderwood Concept Plan is at **Figure 2**.

Lendlease is the developer of the majority of the CUDP (i.e. it is the developer of approximately 600 ha of the overall 700 ha site). The component of the overall CUDP owned / controlled by Lendlease and to

be developed by Lendlease in accordance with the Approved Concept Plan is illustrated at **Figure 3** below. Other areas of land within the boundaries of the Approved Concept Plan are owned by and to be developed by separate entities.

Lendlease has commenced the development of its component of the overall CUDP, and will continue to develop the project in stages over an approximately 15+year period. To date Lendlease has obtained development consents for some 1,200 dwellings within Stages 1, 2a, 2b and 2c and 3a, and lodged development applications for another 650 dwellings in Stages 3b south and 3c of the overall project. Other developers have also lodged development applications for a further 824 lots on land within the Concept Plan boundary that Lendlease does not own or control. **Figure 3** illustrates the development indicative subdivision development plan.

1.3 Secretary's Environmental Assessment Requirements (SEARs)

SEARs were issued by Department of Planning and Environment (DP&E) on 1 February 2018 (MP 09_0082 MOD 4). The SEARs relevant to the ecological values in the study area are listed in **Table 1**. At this stage, Council does not want to take ownership of the riparian corridors. This remains a point of negotiation.

Table 1: SEARs relevant to biodiversity values in the study area

Item	SEARs	Section of this report
7. Biodiversity	7a: Provide an updated assessment of the biodiversity impacts associated with the proposal (particularly impacts on Endangered Ecological Communities located on the site) and provide a description of the proposed actions to avoid or minimise potential impacts. For any unavoidable impacts, an appropriate offset strategy shall be prepared (in consultation with OEH).	**Section 4**
	7b: Assess any additional impacts of the proposal on groundwater dependent ecosystems	**Section 3.3**
8. Riparian impacts	8a: Identify and address any additional impacts on riparian areas, watercourses, other important aquatic habitats and other significant and ecologically sensitive areas.	**Section 4**
	8b: Identify and address any required amendments to the Vegetation Management Plans associated with the riparian corridors to meet any current standards	**Section 4.3**
	8c: Identify and address any proposed changes to the future management and ownership arrangements of the riparian corridors and demonstrate fragmentation of the riparian corridors will be minimised/avoided.	**Section 1.3**
	8d: Include details of how the NSW Water Quality and River Flow objectives within the receiving waters of Lake Illawarra will be achieved during the future construction and operational phrases of the development.	**Not covered in this report (see Watercycle and Flood Management Strategy)**

1.4 Report outline

The purpose of this report is to address the SEARS issued by DP&E regarding the modification of the Approved Concept Plan. The following report must be read in conjunction with the Calderwood Urban Development Project – Flora and Fauna Assessment (ELA 2010).

The following report outlines the following:

- proposed concept plan modification
- assessment of ecological impacts proposed under the modified Plan against Approved Concept Plan
- assessment of remaining development likely to trigger the Biodiversity Offsets Scheme and indicative calculations for any remaining development areas likely to trigger the Scheme
- review of relevant statement of commitments to determine level of completion
- outline of any avoidance, minimisation or mitigation measures
- any relevant outcomes from consultation between Lendlease, Shellharbour City Council, Wollongong City Council, Natural Resources Access Regulator and Office of Environment and Heritage.

2 Proposed concept plan modification

The proposed modification to the Approved Concept Plan seeks to increase the total provision of housing (approximate number of dwellings) within the overall CUDP to respond to market demand for the provision of smaller housing types / lot sizes at affordable price points and to ensure the efficient use of urban zoned land within this context for the supply of housing.

It is proposed to increase the overall number of dwellings to be delivered within the existing area of land zoned R1 General Residential and B4 Mixed Use and also approved for urban development as shown on the Approved Concept Plan from approximately 4,800 to approximately 6,500 dwellings.

The increased residential yield is predominantly due to affordability pressures that are driving stronger demand for smaller and more diverse housing types. Those stages of development already approved at Calderwood include a more diverse mix of housing types and lot sizes than was supported by the market at the time the concept plan was approved in 2010, both in the Lendlease holdings and those developments being progressed by others.

If current trends in lot sizes and dwelling types continue, the overall yield anticipated by the concept plan will be reached without some stages of the Calderwood masterplan being developed. If this occurs, the currently approved yield would also constrain the delivery of low scale apartments in the town centre, as the residential component of the town centre is proposed to be developed in the later stages. This would mean opportunities for housing close to shops, jobs and services, and to provide housing suitable for smaller households, will be missed.

Allowing for increased housing supply will support the delivery of more integrated housing product in appropriate locations within the CUDP, including more diverse housing product.

The increase in housing supply for the CUDP is proposed without any expansion of the footprint of urban zoned land (residential and mixed use zoned land) and without any change to the minimum lot sizes permitted under State Environmental Planning Policy (State Significant Precincts) 2005 (State Significant Precincts SEPP). It is also proposed without any change to the areas of land already approved for residential and other urban development under the existing Concept Plan Approval.

No substantive changes are proposed to the Approved Concept Plan in respect of approved land uses, the urban structure of the development, the road and pedestrian network within the site, the overall range of minimum lot sizes/dwelling types/lot types to be provided, nor the scope of environmental protection outcomes for the land including the quantum and configuration of riparian and environmental corridor and environmental reserve lands.

Within the Approved Concept Plan framework, the proposed increased dwelling yield will be achieved via the delivery of a greater diversity of dwelling types and lot sizes within the R1 General Residential and B4 Mixed Use zones generally as follows:

- Within the R1 General Residential zone, additional yields will be achieved through the delivery of a more diverse range of housing types such as seniors housing and integrated housing and also by a different mix of lot sizes than was anticipated at the time of the Approved Concept Plan in 2010 (including a greater number of smaller lots within 800m of the Town Centre and 400m of the Village Centre) to respond to the changing and more diverse market expectations and housing affordability pressures;

- Within the B4 Mixed Use zone, the number of dwellings to be provided will be increased through the provision of a combination of more shop top housing, mixed use development and stand-alone residential development.

A range of new provisions are proposed to be incorporated into the Development Control Strategy to allow for the broader range of housing typologies, lot sizes and affordable housing options that are proposed to meet current market demand.

Related changes to the Approved Concept Plan are proposed to ensure the Calderwood development meets the needs of residents, namely:

- an increase in the area of land required for open space within the site,
- an increase in the provision of retail floor space within the new town centre;
- additional local and regional transport infrastructure, and
- delivery of more capacity in local community infrastructure including the planned community centre.

The modification also proposes a number of minor housekeeping amendments to reflect current circumstances including:

- updates to the approved flood mitigation plan to reflect the increased site coverage and adopted flood model from Shellharbour City Council.
- minor amendments and updates to road hierarchy and typology standards to meet Council requirements;
- minor amendments to the location of pedestrian and cycle pathways to reflect the revised street layout and improved connections between open space within the CUDP.

The proposed modified Concept Plan is shown at Figure 4.

Figure 1: Calderwood Valley Land Ownership Plan (source Lendlease Communities)

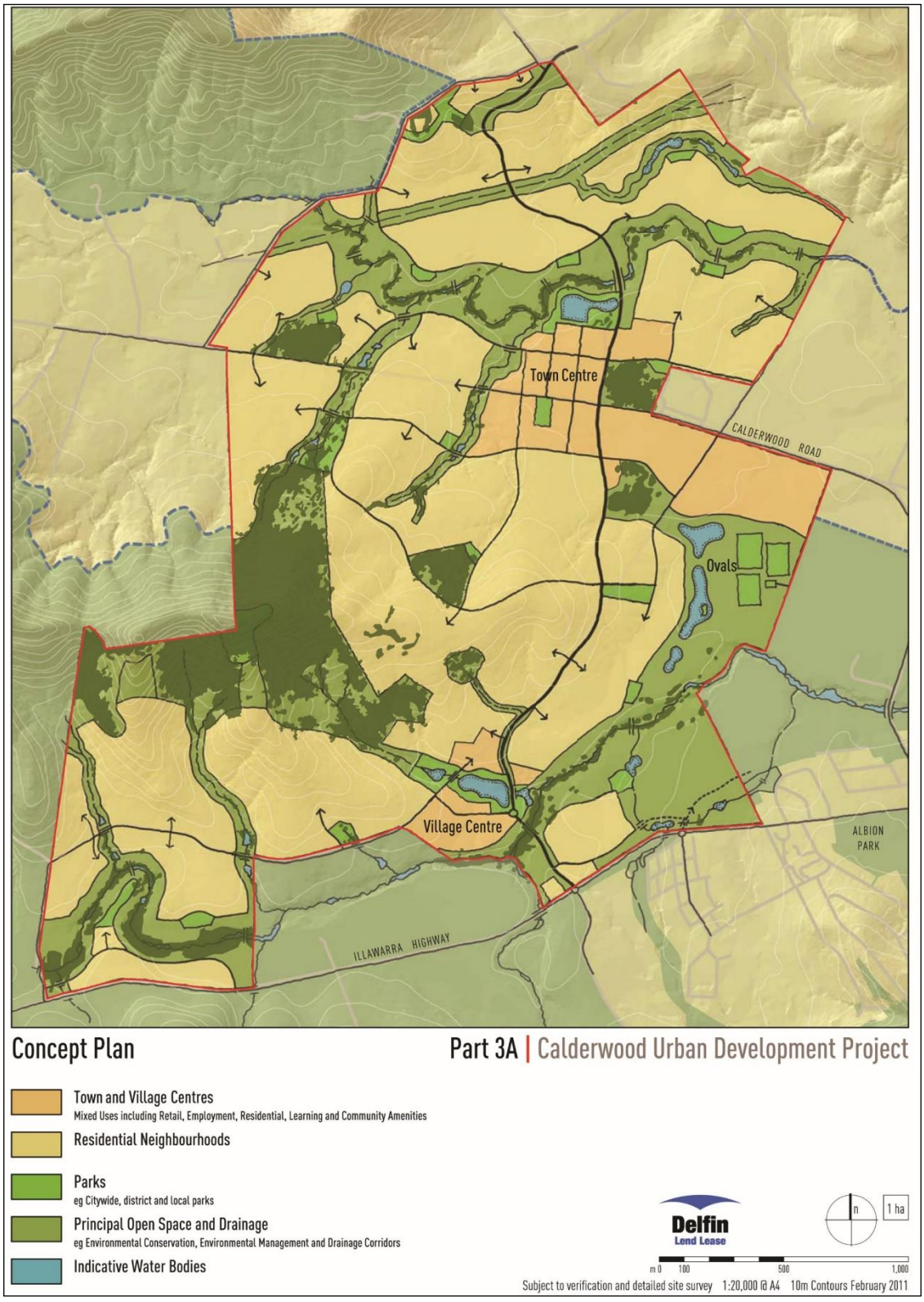

Figure 2: Approved Concept Plan (source Consolidated Concept Plan March 2011)

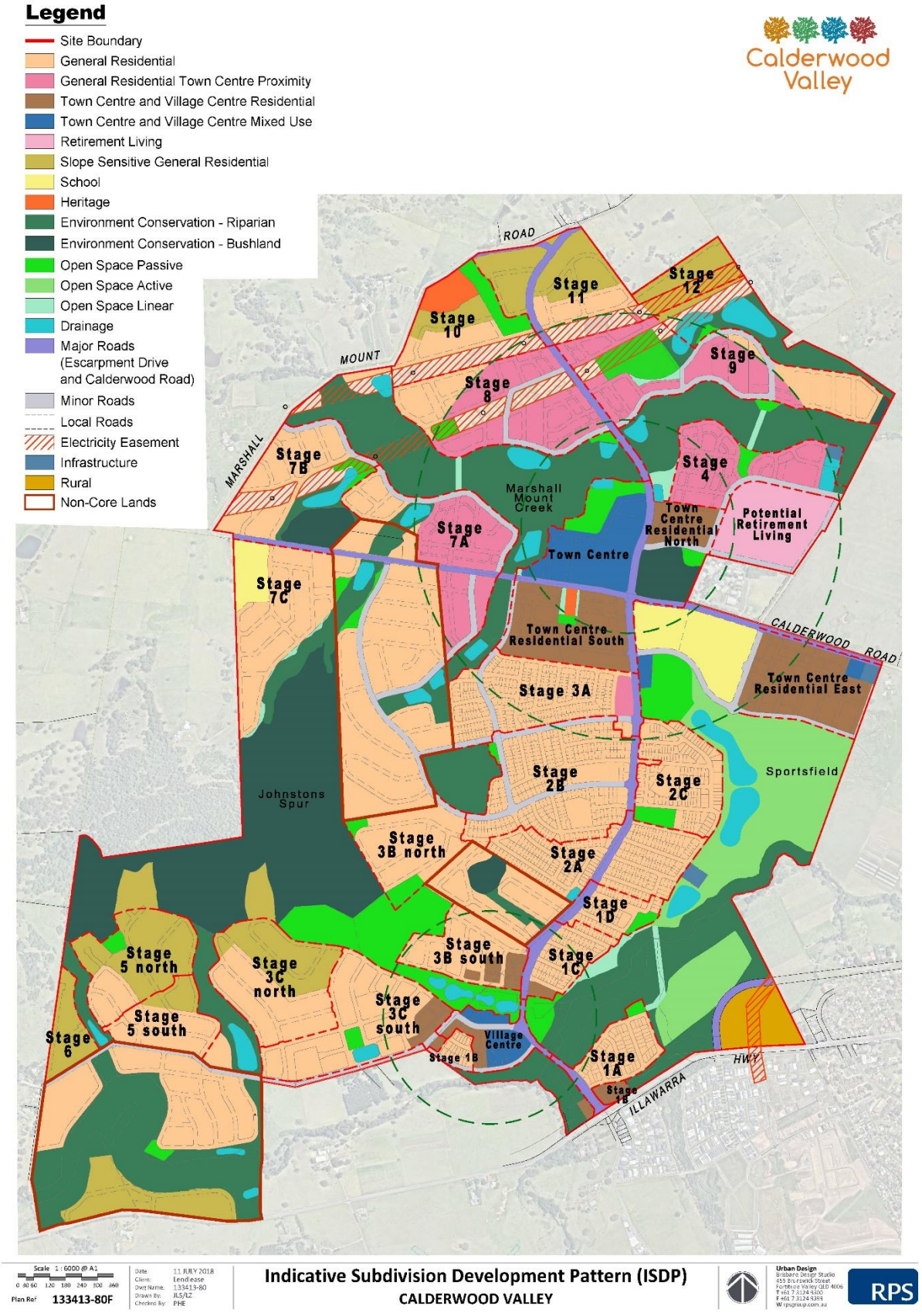

Figure 3: Indicative subdivision development pattern (Source Urban Design Report. RPS)

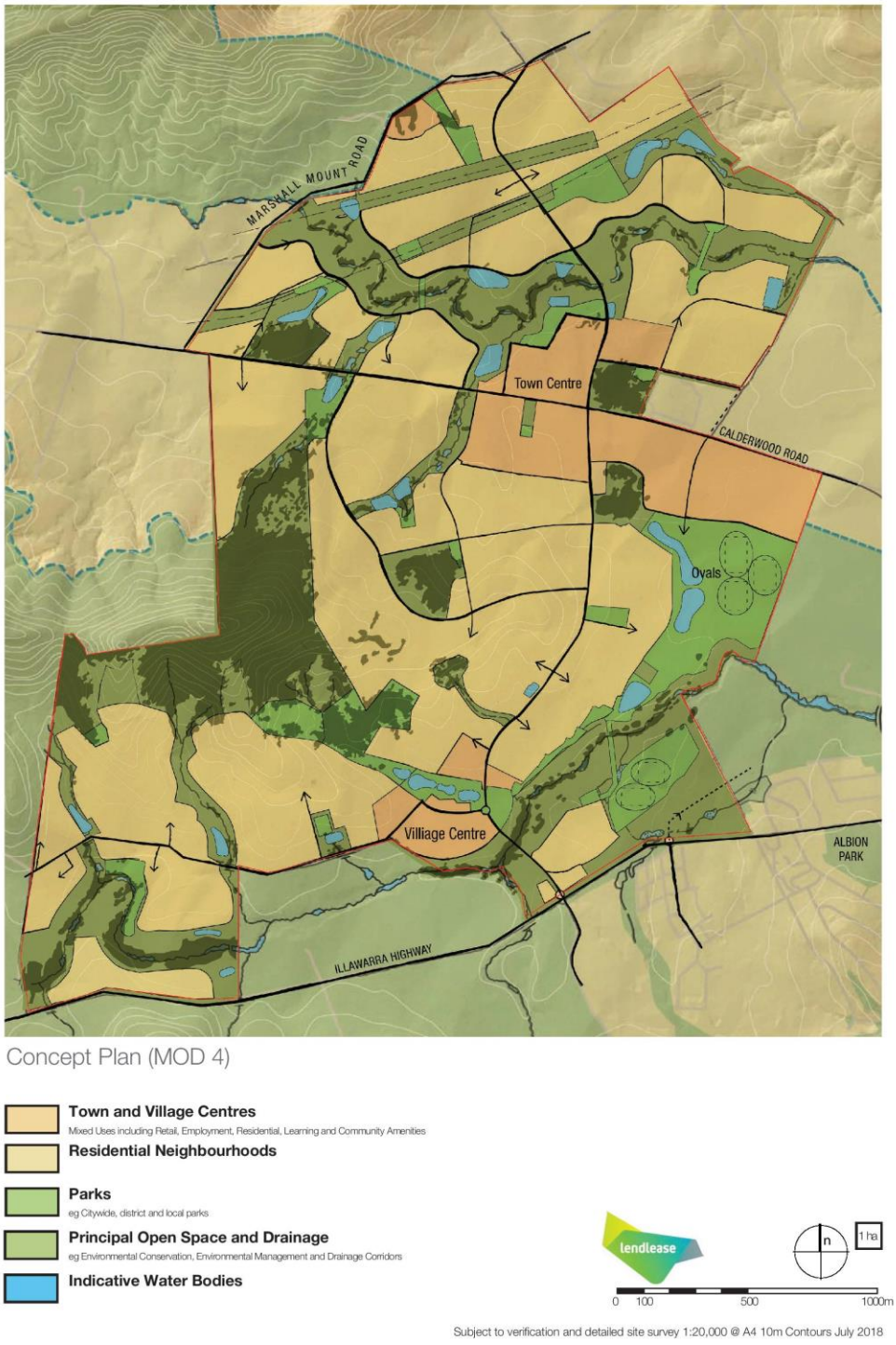

Figure 4 Proposed modified Concept plan (Source Lendlease Communities August 2018)

3 Existing environment

This section outlines the results of a literature and data review and field survey conducted across the study area as part of the Flora and Fauna Assessment prepared for Delfin Lendlease (ELA 2010).

3.1 Terrestrial ecological values

3.1.1 Vegetation communities

Five vegetation community types were identified through the field investigation and review of NPWS (2002) vegetation mapping. The native vegetation communities were:

- Coastal Grassy Red Gum Forest
- Lowland Dry-subtropical Rainforest
- Lowland Woollybutt-Melaleuca Forest Moist
- Moist Box-Red Gum Foothills Forest
- Riparian River-oak Forest.

3.1.2 Conservation status

Of the five native vegetation communities identified, four correspond with three threatened ecological communities listed under the BC Act. Two also correspond with a community listed under the EPBC Act as indicated in **Table 2**.

Table 2: Threatened ecological communities in the study area

Community on site	Corresponding Threatened Ecological Community	BC Act listing	EPBC Act listing
Lowland Dry-subtropical Rainforest	Illawarra Subtropical Rainforest in the Sydney Basin Bioregion	E	-
Lowland Woollybutt-Melaleuca Forest	Illawarra Lowlands Grassy Woodland in the Sydney Basin / Illawarra and South Coast Lowland Forest and Woodland	E	CE
Coastal Grassy Red Gum Forest			
Riparian River-oak Forest	River-flat Eucalypt Forest on Coastal Floodplain	E	-

At the time of the flora and fauna assessment, Illawarra Lowlands Grassy Woodland was not listed as a matter of national significance under the EPBC Act. This community was listed in September 2016 as critically endangered and forms part of Illawarra and South Coast Lowland Forest and Woodland under the EPBC Act.

3.1.3 Condition

Remnant vegetation community condition codes were developed by NPWS as part of the native vegetation mapping project (NPWS 2002). These provided the basis for the condition assessment of the study area for the Approved Concept Plan. Over 75% of the study area had been heavily modified by clearing for grazing, particularly on the lower slopes and foothills within the site.

The largest patch of native vegetation is located on Johnston's Spur. It comprised Coastal Grassy Red Gum Forest, Moist Box-Red Gum Foothills Forest and Lowland Dry-Subtropical Rainforest. The core area of the Coastal Grassy Red Gum Forest was in moderate condition, with the outer margins comprising

scattered trees. Acacia scrub regrowth (13.44 ha) and weeds and exotics (approximately 21 ha) add to the area of vegetation cover on the southern side of Johnston's Spur.

Riparian vegetation along Marshall Mount Creek and Macquarie Rivulet comprised approximately 26.75 ha of Riparian River Oak Forest. This was mostly contiguous, highly disturbed and regenerating with varying levels of weed invasion. There were three pockets of Lowland Woollybutt-Melaleuca Forest. The core of these areas was moderately disturbed (about 10 ha collectively). The margins comprised scattered trees (about 7 ha collectively).

All stands of remnant native vegetation contained established mature trees, with areas classed as condition 'B', exhibiting a more complete range of age classes. Tree hollows were common throughout most areas of remnant native vegetation on the site. There were several areas of paddock trees across the site, that were mapped with the condition code 'TX'. Typically, these areas had a very sparse native canopy and an understorey of exotic pasture. Based on the canopy species present these areas were assigned to the most closely related ecological community. However due to the long-term disturbance history of the site, it is highly unlikely that these areas would regenerate to the corresponding community and significant artificial enhancement would be required to reinstate 'natural' shrub and ground layers.

3.1.4 Threatened species habitat assessment

Potential threatened fauna and flora species habitat was identified for the species outlined in **Table 4**. No targeted survey was undertaken as part of the Flora and Fauna Assessment report. However, after the Concept Plan was approved in 2010, and consistent with one of the Statement of Commitments, targeted survey for *Pterostylis gibbosa* (Illawarra Greenhood) was conducted. The targeted surveys were carried out by an orchid specialist and during the time when the species was in flower at nearby reference sites. The survey was carried out in areas identified in the Statement of Commitments as containing potential habitat for this species. The surveys demonstrated that this species was not present within the Project area.

3.2 Riparian and aquatic ecological values

The study area includes a section of Marshall Mount Creek and part of the northern bank of Macquarie Rivulet. Both streams have highly disturbed, regenerating native riparian vegetation (Riparian River Oak Forest) and provide habitat for aquatic and riparian species. The streams were assessed to determine habitat value and condition. The minor streams on site were not assessed because of their limited value as aquatic habitat. Condition deteriorated from moderate to poor moving downstream in Marshall Mount Creek. Stream condition was better overall in Macquarie Rivulet (moderate/good) than in Marshall Mount Creek.

Current agricultural practices have degraded water quality in the study area. Removal of cattle and implementation of water sensitive urban design as part of the Approved and proposed Concept Plans should improve the quality of flows to Lake Illawarra and the value of aquatic habitat within and downstream of the site (for full detail refer to the stormwater and flooding technical specialist reports). The lake is an important ecological and recreational feature in the region and some of the fringing wetlands are unlikely to be influenced by flows from this site.

The *Coastal Management Act 2016* replaces the *Coastal Protection Act 1979* and establishes a new strategic framework and objectives for managing coastal issues in NSW. State Environmental Planning Policy (Coastal Management) 2018 updates and consolidates into one integrated policy SEPP 14 (Coastal Wetlands), SEPP 26 (Littoral Rainforests) and SEPP 71 (Coastal Protection. The Coastal Management SEPP gives effect to the objectives of the *Coastal Management Act 2016* from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the

coastal zone. Areas of vegetation and parts of the waterway along Marshall Mount Creek are mapped either as Coastal Wetlands or Proximity Area for Coastal Wetlands.

Development on land mapped as Coastal Wetland can include earthworks, environmental protection works, and any other development, with consent. Apart from environmental protections works, any other development would be designated development for the purposes of the EP&A Act. Development consent cannot be granted on land mapped as a Proximity Area for Coastal Wetlands unless the authority is satisfied that there will be no significant impact on:

- the biophysical, hydrological or ecological integrity of the adjacent coastal wetland
- the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland.

No aquatic or marine species listed under the *Fisheries Management Act 1994* are known or likely to occur on the site. Aquatic habitat values are largely degraded through erosion, cattle grazing and unfettered access to riparian areas and the construction of a number of impediments to the movement of aquatic species (dams, causeways etc). The Approved Concept Plan has aimed to facilitate improvement of aquatic habitat through the removal of grazing pressures, establishment of native vegetation, improvements to water quality and the removal of in-stream structures. Re-introduction of woody debris to channels would provide additional aquatic habitat, however such an approach would need to be undertaken in a manner that does not result in adverse changes to flood dynamics. These improvements and enhancements would be carried out under the proposed modification.

3.3 Groundwater dependent ecosystems

A search of the Groundwater Dependent Ecosystems Atlas (BOM 2018) was undertaken to determine the presence of any groundwater dependent ecosystems in the study area. There are no aquatic or subterranean groundwater dependent ecosystems in the study area.

The study area contains numerous terrestrial groundwater dependent ecosystems. A terrestrial groundwater dependent ecosystem refers to terrestrial vegetation communities. The terrestrial groundwater dependent ecosystems overlap with the areas marked for E2 Environmental Conservation, Johnsons Spur and the vegetation present along Macquarie Rivulet. There are no additional terrestrial groundwater dependent ecosystems in the study area.

4 Review of proposed impacts to ecological values

4.1 Review of ecological impacts under the old and new concept plan

The proposed impacts assessed as part of the Approved Concept Plan and the proposed modifications were compared visually and spatially to identify any areas of differences. This assessment has only considered the data provided for subdivision boundaries and basic zoning. It has been assumed that impacts associated with the installation of ancillary infrastructure, such as electricity have been incorporated into the areas within stage boundaries. Vegetation data used for the 2010 Plan was used as a base for comparing the new with the old Plans.

The comparison has indicated that the current indicative lot layout plan is largely consistent with the Approved Concept Plan to the extent that the areas of impact remain similar (**Figure 5**). Discrepancies in some areas are likely a result of mapping anomalies rather than a change in the footprint. It is unlikely additional native vegetation would be directly affected as a result of the increase in yield.

Table 3: Vegetation to be retained and cleared under the old and new Plans

Vegetation Community	Cleared area under 2010 Plan (ha)	cleared area under 2018 Plan (ha)	Retention under 2010 Plan (ha)	Retention under 2018 Plan (ha)
Acacia Scrub	0.02	0.02	13.43	13.42
Artificial Wetlands	4.93	5.28	6.67	6.32
Coastal Grassy Red Gum Forest	21.40	21.68	30.16	29.89
Fig Trees	0.48	0.48	0.00	0.00
Lowland Dry-Subtropical Rainforest	0.14	0.18	3.59	3.54
Lowland Woollybutt-Melaleuca Forest	6.04	6.29	11.13	10.88
Moist Box-Red Gum Foothills Forest	0.73	0.74	9.94	9.94
Riparian River Oak Forest	2.20	2.49	24.55	24.26
Weeds and Exotics	8.17	8.38	12.50	12.28
Total	**44.11**	**45.54**	**111.96**	**110.53**

The Flora and Fauna Assessment report (ELA 2010) identified three threatened ecological communities, four threatened flora and 20 threatened fauna either known or considered likely to occur in the study area. Recent searches of the BioNet / Atlas of NSW Wildlife (OEH 2018a) and the EPBC Act Protected Matters Search Tool (DotEE 2018a) were undertaken to identify any additional threatened species, populations or communities likely to occur in the study area. No new threatened ecological communities, species or populations were considered likely to occur. Illawarra Lowlands Grassy Woodland, listed under the BC Act is listed as Illawarra and South Coast Lowland Forest and Woodland as a matter of national environmental significance under the EPBC Act. This community was listed in September 2016. **Table 4** describes the likelihood of occurrence assigned to each threatened ecological value and the change in listing, if any, since 2010.

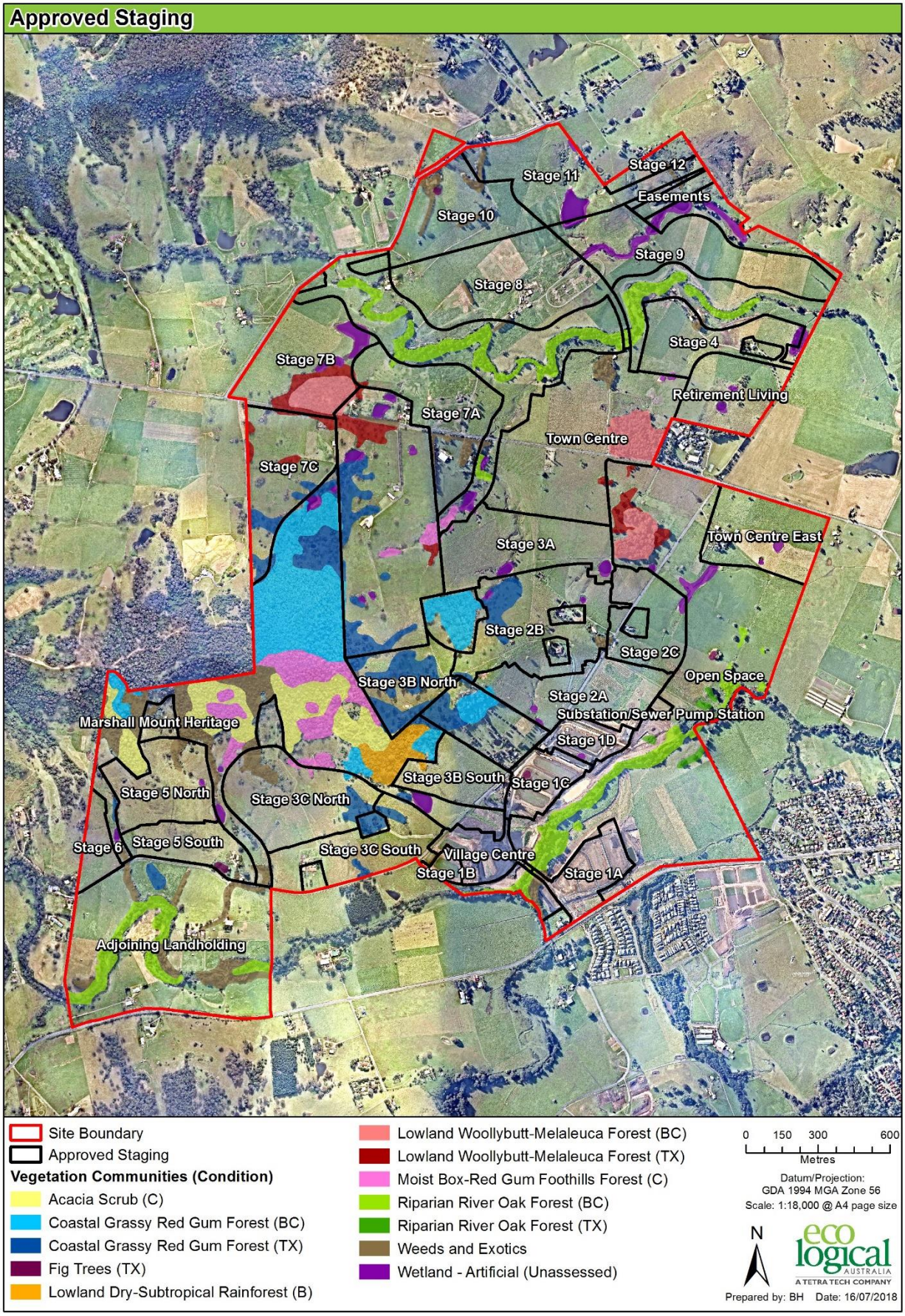

Figure 5 Areas of vegetation affected by the proposed Concept Plan at Calderwood

The E2 and E3 land mapped for retention in the Approved Concept Plan is consistent with the proposed modified plan. The Environmentally Significant Lands layer (ESL) was mapped in the Flora and Fauna Assessment report (ELA 2010). The ESL layer corresponds to areas mapped as 'primary vegetation' (ELA 2010). This land was zoned E2 and E3 and no additional impacts on ESL land is expected to occur (**Table 3**).

No additional impacts on groundwater dependent ecosystems are anticipated by the proposed Concept Plan. Flows to and from terrestrial groundwater dependent ecosystems are expected to be maintained. The proposed Plan would not clear any additional lands mapped as groundwater dependent ecosystems and the maintenance of flows in both Marshall Mount Creek and Macquarie Rivulet are not expected to be altered because the proposed modification.

4.2 Impacts on EPBC Act listed matters

The proposed development was referred to the Commonwealth on 2 March 2010 (EPBC 2010/5381). The Commonwealth determined on 30 March 2010 that the proposed development was not a controlled action and therefore the proposed action did not require further assessment and approval under the EPBC Act before proceeding.

Two threatened fauna species and one threatened ecological community have had status changes since the decision of the Commonwealth on 30 March 2010 (**Table 4**). Illawarra and South Coast Lowland Forest and Woodland is now listed as critically endangered under the EPBC Act. This community exists in several small patches within the study area and would be bordered by moderate density residential development. Despite this there would be no change in the height or land use from the Approved Concept Plan to the proposed Concept Plan. The land in the town centre has been zoned B4, which would allow for building heights of 18 m, which would accommodated residential apartment buildings up to six storeys.

Rostrulata australis (Australian Painted Snipe) was not previously listed under the EPBC Act and is now listed as endangered. *Lathamus discolor* (Swift Parrot) has been up-listed from endangered to critically endangered. The Australian Painted Snipe has potential to utilise the fresh water bodies, dams and riparian corridors in the study area for foraging. The Australian Painted Snipe relies on shallow wetlands containing areas of bare mud and canopy cover (DotEE 2018b). The study area lacked freshwater wetlands. Some dams and riparian corridors are present, however they do not form a wetland and do not contain suitable breeding habitat elements.

The Swift Parrot may forage across the study area. The study area would not be used for breeding habitat. The Swift Parrot breeds in Tasmania.

The following discussion refers to Illawarra and South Coast Lowland Forest and Woodland, Australian Painted Snipe and the Swift Parrot collectively as the 'listed matters'. Where obvious differences exist, these are discussed separately.

No additional direct impacts to the listed matters are expected. Indirect impacts that may affect the listed matters include:

- rubbish dumping
- noise, dust and vibration
- spread of weeds
- changes to hydrology and water flow

- increase in sedimentation and runoff.

Greater residential yield adjacent to the listed matters is likely to increase the indirect impacts listed above, however these are unlikely to occur to such an extent that a significant impact is likely. Significant impacts on Illawarra and South Coast Lowland Forest and Woodland are unlikely to occur given the following:

- no additional Illawarra and South Coast Lowland Forest and Woodland would be removed in the study area compared to the Approved Concept Plan
- the proposed action would not reduce the extent of the ecological community within the locality compared with the Approved Concept Plan
- any indirect impacts are likely to be limited to the edges of the patch which is unlikely to affect the survival of the community compared with the Approved Concept Plan
- any indirect impacts would not affect the integrity of the community such that it is placed at greater risk of extinction.

The Australian Painted Snipe and Swift Parrot may utilise the study area for foraging on an occasional basis. There are no recent records (since 1 January 1990) for the Swift Parrot or Australian Painted Snipe within a 10 km radius of the study area (OEH 2018). Any indirect impacts likely to occur would not have a significant impact on these species given the following:

- Both species are highly mobile and forage widely. Impacts on foraging habitat were considered to be not controlled by the Commonwealth under the original Plan. An increase in residential density in areas already marked for development would not affect additional foraging habitat for these species.
- The species would not solely rely on the study area to complete critical life cycle phases such as breeding. Swift Parrot breeds in Tasmania and the study area lacks suitable habitat elements to support breeding Australian Painted Snipe. The proposed changes to the Plan would not increase impacts to any areas of habitat considered likely to provide breeding habitat for Swift Parrot.
- No additional potential foraging habitat is proposed for removal.
- About 110 ha of potential Swift Parrot foraging habitat would be retained across the study area. Any indirect impacts likely to occur would be small in extent, would not affect the extent of the foraging habitat and would be limited to the groundcover layer.
- Macquarie Rivulet and Marshall Mount Creek would be retained and improved under Vegetation Management Plans and would provide foraging habitat for the Australian Painted Snipe.

The activity to be carried out pursuant to the proposed modification is generally consistent with the action referred to the Commonwealth on 2 March 2010 (EPBC 2010/5381) in terms of area and impacts on the listed matters.

Table 4: Threatened species and ecological communities identified as having potential to occur in the study area

Scientific name	Common name	Likelihood of occurrence (FFA 2010)	2010 TSC Act status	2018 BC Act Status	2010 EPBC Act Status	2018 EPBC Act Status
ECOLOGICAL COMMUNITIES						
Illawarra and South Coast Lowland Forest and Woodland		Known	E1	E1	Not listed	CE
Illawarra Subtropical Rainforest		Known	E1	E1	-	-
River Flat Eucalypt Forest		Known	E1	E1	Not listed	Nominated
FLORA						
Cynanchum elegans	White-flowered Wax Plant	Likely	E1	E1	E	E
Daphnandra johnsonii	Illawarra Socketwood	Likely	E1	E1	E	E
Pterostylis gibbosa	Illawarra Greenhood	Potential	E1	E1	E	E
Zieria granulata	Hill Zieria	Potential	E1	E1	E	E
FAUNA						
Apus pacificus	Fork-tailed Swift	Potential	-	-	M	M
Ardea ibis	Cattle Egret	Likely	-	-	M	Mar – no assessment required
Botaurus poiciloptilus	Australasian Bittern	Potential	V	E1	Not listed	E
Callocephalon fimbriatum	Gang-gang Cockatoo	Potential	V	V	-	-
Calyptorhynchus lathami	Glossy Black-Cockatoo	Potential	V	V	-	-
Chalinolobus dwyeri	Large-eared Pied Bat	Likely	V	V	V	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Potential	V	V	-	-
Ixobrychus flavicollis	Black Bittern	Likely	V	V	-	-
Lathamus discolor	Swift Parrot	Potential	E1	E1	E	CE
Lophoictinia isura	Square-tailed Kite	Potential	V	V	-	-

Scientific name	Common name	Likelihood of occurrence (FFA 2010)	2010 TSC Act status	2018 BC Act Status	2010 EPBC Act Status	2018 EPBC Act Status
Merops ornatus	Rainbow Bee Eater	Likely	-	-	M	Mar – no assessment required
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	Likely	V	V	-	-
Neophema pulchella	Turquoise Parrot	Potential	V	V	-	-
Ninox strenua	Powerful Owl	Potential	V	V	-	-
Pachycephala olivacea	Olive Whistler	Likely	V	V	-	-
Petroica rodinogaster	Pink Robin	Potential	V	V	-	-
Rostraluta australis	Australian Painted Snipe	Likely	-	E1	M	E
Pteropus poliocephalus	Grey-headed Flying-fox	Likely	V	V	V	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Potential	V	V	-	-
Stictonetta naevosa	Freckled Duck	Likely	V	V	-	-

TSC Act / BC Act Key: E1 = endangered, V = vulnerable

EPBC Act Key: M = migratory, Mar = Marine, E = endangered, CE = critically endangered

4.3 Impacts on riparian and aquatic values

Riparian corridors for retention and those suitable for removal were identified in the Approved Concept Plan. The approved riparian strategy within the Plan included:

- Provision of regional linkages from the ocean to the escarpment via the principal riparian corridors of Marshall Mount Creek and Macquarie Rivulet.
- Identification of a series of secondary corridors from the regional linkages to Johnston's Spur reflecting their relative importance as riparian corridors. Secondary corridors will support the primary corridors.
- Provision of a sufficient Core Riparian Zone (CRZ) for remaining riparian corridors to provide for bed and bank stability. The CRZ is the total width of the corridor.

The Approved Concept Plan requires:

- retention of the riparian corridors that have been assessed and determined to have a requisite hydrological function

- a riparian corridor of 92 m total width to be provided to Marshall Mount Creek and Macquarie Rivulet
- a riparian corridor of 48 m total width to streams extended from the main valley floor environmental corridors to Johnston's Spur.

Stream reach 15 (Figure 5 of the Approved Concept plan), near the proposed retirement village, is proposed to be affected by fill for this part of the development. Therefore, this Plan seeks to have this part of the riparian corridor removed. This reach is a first order stream and is located in a highly modified context. The section proposed for removal is the terminating arm, which is located in a paddock with no upper stream connectivity. There is little to no remnant native vegetation fringing this section of the reach 15. Two artificial wetlands (farm dams) are located on this segment proposed for removal. Removal of this segment of reach 15 is not likely to significantly affect overall riparian function in this part of the study area, or in Marshall Mount Creek, into which it flows. Condition in Marshall Mount Creek where stream reach 15 enters was considered poor (see Figure 5 of the Approved Concept Plan). Areas of ESL downstream from this segment have been avoided.

All riparian corridors marked for retention would be subject to the implementation of a Vegetation Management Plan. The Vegetation Management Plans would:

- be submitted as a condition of development consent
- be consistent with NRAR guidelines for planting densities and the Approved Concept Plan
- develop suitable key performance indicators to measure implementation
- monitor and report against key performance indicators would occur as part of the VMP reporting requirements
- be implemented in for five years and the Plans listed on title
- require liaison between proponent, Council and NRAR following implementation.

4.4 Avoidance, minimisation and mitigation

The following measures have been recommended to avoid, minimise and mitigate potential impacts to ecological values within the study area:

4.4.1 Avoidance

- Yield increases have been achieved by increasing density in already approved residential and mixed use zoned areas.
- Lot sizes have been decreased in some instances to improve yield while avoiding native ecological values.
- Ancillary infrastructure should be contained within the stage boundaries to avoid impacts on lands to be retained.
- all Asset Protection Zones (APZs) should not overlap with areas mapped as ESL / E2 or E3 lands..
- In areas where parks or open space include native vegetation, the native vegetation should be retained where possible
- All flood mitigation works should be designed to avoid impacts on ESL / E2 lands.
- Explore options to retain significant trees and further impacts in Stage 3B North, where practicable.

4.4.2 Minimise

- Any vegetation to be retained in Stage 3B North should maintain connectivity to the adjacent E3 zone including rehabilitation of the retained vegetation.
- Tree protection fencing should be placed around the boundary of native vegetation to be retained. High visibility orange safety mesh should be used at a distance of 1 m radius from the trunk of the outermost tree in the areas marked for retention. Clear "No-Go Area" signage should be attached to the fencing.
- Signage similar to that used for tree protection should be used to clearly delineate the impact areas from Johnsons Spur.
- Adaptive re-use of ecological habitat features could be considered to minimise impacts on fauna. For example, coarse woody debris should be retained and placed in vegetated areas to maintain the level of shelter and food resource for invertebrates, small reptiles and mammals that may occur.
- To minimise harm to wildlife, standard pre-clearance surveys and supervision should take place. Trees should be inspected for nests in branches, foliage and among exfoliating bark immediately prior to felling.
- A clearance survey should be conducted during the felling of hollow bearing trees.

- Drainage should be controlled in the impact areas consistent with the *Protection of the Environment Operations Act 1997* requirements to avoid impacts on downstream habitats and threatened ecological communities present in the E2 lands.
- All earthworks should adopt a sediment and erosion control plan to minimise impacts on neighbouring native vegetation and minimise spread of weeds.
- Equipment, heavy machinery and materials should be positioned in designated lay-down areas in portions of cleared land where they are least likely to cause erosion or damage vegetation.
- Work should not take place during or after heavy rain when doing so is likely to cause soil erosion or soil structural damage or result in indirect impacts on the neighbouring E2 lands or retained native vegetation.
- Work vehicle access should be restricted to designated work areas and existing formed access tracks/roadways.
- Weed removal should be undertaken using mechanical and manual means, without the use of herbicides.

4.4.3 Mitigation

- All lands covered by the ESL overlay or forming part of a riparian corridor would be managed consistent with the current Statement of Commitment 35.
- Where possible, open space and local parks could include the construction of habitat elements such as ponds and artificial wetlands.

5 Biodiversity offset strategy

5.1.1 Biodiversity Offsets Scheme triggers

The CUDP was submitted under the former planning provisions of Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and was approved (with modifications). Thus far, six development applications have been submitted to Shellharbour City Council by Lendlease with four approved and two pending approval. Stage 1 was submitted under the former Part 3A provisions and approved by the NSW Land and Environment Court. These development applications have been assessed under the former planning provisions of the EP&A Act. Additional DA have been lodged on all non-core lands, which are not controlled by Lendlease.

The remaining stages which require the submission of a development application (DA) would be subject to the assessment provisions contained in the *Biodiversity Conservation Act 2016* (BC Act). Discussions with Office of Environment and Heritage (OEH) has determined that the potential requirement of any offsets will be assessed at each DA and would be calculated under the new provisions within the BC Act.

The introduction of the BC Act includes a range of triggers for the Biodiversity Offsets Scheme (BOS), which are discussed in detail below. The triggers for the BOS are:

- impacts on land mapped under the Biodiversity Values Map
- clearing of native vegetation above the permissible threshold
- determination through the application of a 5 part test that the impact is significant to threatened entities listed on the BC Act
- impacts to areas of outstanding biodiversity value.

The Biodiversity Values Map covers the extent of Macquarie Rivulet and Marshall Mount Creek. Any works within the area covered by this map along Macquarie Rivulet and Marshall Mount Creek would trigger the BOS.

A proponent will trigger the BOS if >0.25 ha of native vegetation is cleared where the minimum lot size is up to 1 ha. A few stages will trigger the BOS (**Table 5**). It must be noted that **Table 5** assumes all impacts to land along the riparian corridors mapped under the Biodiversity Values Map would be affected as one individual stage. If works within the riparian corridors mapped under the Biodiversity Values Map form part of other stages, then this would trigger the BOS for that stage.

Table 5: Potential BOS triggers for each stage in the study area

Stage	BOS Trigger	Type	Other
Stage 1A	No	Major project – approved	SoC 35. VMP prepared
Stage 1B	No	DA approved	SoC 35 VMP prepared(ELA 2014)
Stage 1C	No	DA approved	SoC 35. VMP prepared
Stage 1D	No	DA approved	SoC 35. VMP prepared

Stage	BOS Trigger	Type	Other
Stage 2A	No	DA approved	SoC 35. VMP required
Stage 2B	No	DA approved	SoC 35. VMP prepared (ELA 2017)
Stage 2C	No	DA approved	SoC 35. VMP prepared (ELA 2017)
Stage 3A	No	DA approved	SoC 35. VMP prepared (ELA 2017)
Stage 3B North	Likely	About 5.65 ha of native vegetation to be removed	SoC 35. VMP required
Stage 3B South	No	DA submitted under former planning provisions	SoC 35. VMP required
Stage 3C North	No	DA submitted under former planning provisions	SoC 35. VMP required
Stage 3C South	No	DA submitted under former planning provisions	SoC 35. VMP required
Stage 4	Unlikely	-	SoC 35. VMP required
Stage 5 North	Unlikely	-	SoC 35. VMP required
Stage 5 South	Unlikely	-	SoC 35. VMP required
Stage 6	Unlikely	-	SoC 35. VMP required
Stage 7A	Unlikely	-	SoC 35. VMP required
Stage 7B	Likely	About 1.68 ha of native vegetation to be removed	SoC 35. VMP required
Stage 7C	Likely	About 2.96 ha of native vegetation to be removed	SoC 35. VMP required
Stage 8	Unlikely	-	SoC 35. VMP required
Stage 9	Unlikely	-	SoC 35. VMP required
Stage 10	Unlikely	-	-
Stage 11	Unlikely	-	-
Stage 12	Unlikely	-	-

Stage	BOS Trigger	Type	Other
Village Centre	No	Major projects – approved as part of Stage 1	SoC 35. VMP required
Town centre	Likely	About 0.37 ha of native vegetation to be removed	SoC 35. VMP required
Town Centre East	Unlikely	-	-
Retirement Living	Unlikely	-	-
Apartment	Unlikely	-	-
Non-Lendlease Land	Likely	About 11.85 ha of native vegetation to be removed	SoC 35. VMP required
Macquarie Rivulet	Yes	Land mapped under BVM	SoC 35. VMP required
Marshall Mount Creek	Yes	Land mapped under BVM	SoC 35. VMP required

If a development proposes Serious and Irreversible Impacts(SAII), the consent authority is required to reject the proposed development. Currently, no biodiversity values subject to SAII are present within the study area. However, the consent authority can nominate ecological values to be subject to SAII. These should be established with the consent authority early.

5.1.2 Biodiversity Offsets Scheme indicative calculations

Indicative offset calculations were undertaken for each stage that is likely to trigger the BOS through clearing of >0.25 ha of native vegetation. Each ELA validated vegetation community was mapped to a corresponding plant community type (PCT) (**Table 6**). To determine the number of ecosystem credits that may be required, the area (ha) of native vegetation to be removed per stage was estimated per PCT (**Table 7**). Using the Biodiversity Assessment Method, the number of credits required is likely to be between 35 - 65 credits per hectare, depending on the condition of the vegetation to be cleared. The low (35 credits per hectare) and high (65 credits per hectare) scenarios were determined for each PCT.

Table 6: ELA validated vegetation communities and corresponding Plant Community Type

ELA Validated Vegetation Communities (2010)	PCT Name	PCT Number
Coastal Grassy Red Gum Forest	Forest Red Gum – Thin-leaved Stringybark Grassy Woodland on Coastal Lowlands, Southern Sydney Basin Bioregion	838
Lowland Woollybutt-Melaleuca Forest	Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion	1326
Lowland Dry-subtropical Rainforest	Lilly Pilly - Sassafras - Stinging Tree subtropical/warm temperate rainforest on moist fertile lowlands, southern Sydney Basin Bioregion	906
Moist Box-Red Gum Foothills Forest	Whalebone Tree - Native Quince dry subtropical rainforest on dry fertile slopes, southern Sydney Basin Bioregion	1300
Riparian River-oak Forest	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	1232
Acacia Scrub	Forest Red Gum – Thin-leaved Stringybark Grassy Woodland on Coastal Lowlands, Southern Sydney Basin Bioregion	838
Fig trees	Lilly Pilly - Sassafras - Stinging Tree subtropical/warm temperate rainforest on moist fertile lowlands, southern Sydney Basin Bioregion	906
Urban Native and Exotic	Not a PCT	-
Cleared land	Not a PCT	-

Table 7: Potential credit requirements to offset removal of native vegetation above BC Act thresholds

Stage	Vegetation communities to be impacted	Area (ha)	Estimate of number of credits required (Low scenario)	Estimate of number of credits required (High scenario)
Stage 3B North	Coastal Grassy Red Gum Forest	5.54	198	367
	Lowland Dry-Subtropical Rainforest	0.04		
	Moist Box-Red Gum Foothills Forest	0.06		
	Total	**5.64**		
Stage 7B	Lowland Woollybutt-Melaleuca Forest	1.68	59	110
	Total	**1.68**		
Stage 7C	Coastal Grassy Red Gum Forest	1.79	104	193
	Lowland Woollybutt-Melaleuca Forest	1.17		
	Total	**2.96**		
Town centre	Lowland Woollybutt-Melaleuca Forest	0.37	13	25
	Riparian River Oak Forest	0.01		
	Total	**0.38**		
	Grand Total	**13.19**	**374**	**695**

6 Statement of Commitments

A total of 77 Statement of Commitments (SoCs) were written into the Approved Concept Plan with several SoCs relating directly to ecological values. These must be adhered to throughout the life of the project. The SoCs outlined in **Table 9** are relevant to impacts on ecological values in the study area.

A majority of the SoCs have begun and would be implemented during future works. The modified plan is largely consistent with the controls outlined in **Table 8** and **Table 9**.

Table 8: Adherence to Statement of Commitments

Current SoC	Responsibility	Recommendations
28 Riparian corridors that have been determined to have a requisite hydrological function will be retained generally in accordance with the Concept Plan Proposed Riparian Corridor Network drawing included at Appendix C of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010).	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	• all future works must observe the riparian corridor width rules for Macquarie Rivulet, Marshall Mount Creek and all corridors extending from Johnsons Spur onto the valley floor. This should be written into all Vegetation Management Plans for the riparian corridors in the study area • all existing Vegetation Management Plans should be reviewed to ensure the riparian corridor width requirements are met. • Relevant to stages 3B North, 3C, 4, 5, 6, 7, 8, 9, 11, 12, Town Centre
29 A riparian corridor of 92 metres total width will be provided to Marshall Mount Creek and to Macquarie Rivulet in accordance with the Concept Plan Proposed Riparian Corridor Network included at Appendix C of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010).	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	as per condition 28. Relevant to stages, 4, 7, 8, 9 and Town Centre
30 A riparian corridor of 48 metres total width will be provided to streams extending from the main valley floor environmental corridors to Johnston's Spur in accordance with the Concept	To be demonstrated by the landowner /applicant at the time	as per condition 28. Relevant to stages 3A, 3B North, 3C, 5, 6, 11, 12, Town Centre

Plan Proposed Riparian Corridor Network included at Appendix C of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010)	of any relevant detailed application	
35 Vegetation Management Plans (VMP)s will be prepared for all works with land that has been identified as Concept Plan Environmentally Significant Land and within the Core Riparian Zones shown on the Concept Plan Riparian Corridor Network included at Appendix C of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010) generally in accordance with the principles of the Landscape and Open Space Masterplan included at Appendix G of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix CC of the Concept Plan Environmental Assessment Report prepared by JBA Urban Planning Consultants dated March 2010).	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	• VMP will be consistent with NRAR guidelines and the CCP • suitable key performance indicators would be developed to measure implementation • monitoring and reporting against key performance indicators will occur as part of the VMP reporting requirements • VMPs would be submitted in perpetuity • liaison between proponent, Council and NRAR would occur following implementation
36 Where Environmentally Significant Land and / or Core Riparian Zones are to be transferred into public ownership, the Proponent will rehabilitate that land in accordance with the VMPs to a suitable condition prior to any handover. Details of the rehabilitation to be undertaken in relation to each area of land, and of the likely ongoing maintenance requirements relating to weed management, bush regeneration and any asset protection zone maintenance of that land, are to be submitted with the relevant detailed application	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	as per condition 35
37 A detailed survey will be carried out in an appropriate season for *Pterostylis gibbosa* (Illawarra Greenwood) prior to any works commencing within potential habitat for that	Applicant	ELA has conducted targeted survey for *Pterostylis gibbosa* across the following dates:

species. Potential habitat for the species is the Lowland Wollybutt-Melaleuca. Following the further detailed survey work, any specific mitigation measures determined as required are to be addressed in the relevant detailed application(s).		• September 2012 across all patches of good quality Illawarra and South Coast Lowland Forest and Woodland consistent with the SoC • October 2016 across all boundaries of ESL Land • December 2016 across all patches of potential habitat within Stage 3C. This SoC has been completed and does not require further action.
38 Mature remnant habitat trees will be individually assessed prior to detailed design in the area identified on Figure 7 of the Flora and Fauna Assessment prepared by Ecological Australia and included at Appendix P of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix Q of the SSS Study and Concept Plan Environmental Assessment Report prepared by JBA Urban Planning Consultants Pty Ltd and dated March 2010). Individual trees considered to provide significant habitat will be retained and incorporated into the design wherever practicable.	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	• Options for retention of significant trees in Stage 3B North are currently under consideration. If areas cannot be retained, the assessment would be consistent with the provisions of the BC Act.

7 Conclusion

An assessment of the proposed modified plan has concluded that no significant additional native vegetation would be cleared. The plan is consistent with the Approved Concept Plan.

The Approved Concept Plan was referred to the Commonwealth on 2 March 2010 (EPBC 2010/5381). The Commonwealth determined on 30 March 2010 that the proposed action was not a controlled action. The modified Plan does not propose to affect any additional areas outside of the original referral area.

Illawarra and South Coast Lowland Forest and Woodland, Australian Painted Snipe and Swift Parrot were either known or considered likely to occur and have been listed or up-listed since the referral of the Approved Concept Plan. The proposed modification may increase indirect impacts to the listed matters in the study area. Any increase of indirect impacts is unlikely to significantly affect the EPBC Act listed matters in the study area.

Any future DA submissions for stages within the study area would be subject to the assessment provisions of the BC Act. Several stages will trigger the BOS. Any works within Macquarie Rivulet or Marshall Mount Creek will trigger the BOS. This includes works associated with reshaping or reforming these waterways where they are covered by the BVM.

Lendlease has commenced implementation and adherence to the current SoCs which form part of the Consolidated Concept Plan. Current SoC 37 has been completed. Current SoC 38 has been partially achieved with different design options under consideration. The remainder of the current SoCs must be adhered to as the project progresses.

The following recommendations and mitigation measures have been made to ensure the current SoCs are adhered to and any indirect impacts to ecological values are minimised:

- Vegetation Management Plans for riparian corridors should be produced and implemented consistent with SoC 35
- significant trees should be retained where practicable to demonstrate consistency with SoC 38
- ensure a sediment and erosion control plan is developed and implemented to minimise indirect impacts on EPBC Act listed matters in the study area (SoC 31, 45)
- all impacts should be retained within the development footprint (SoC 32)
- a pre-clearance and clearance procedure should be adhered to during felling of hollow bearing trees or the clearing of other significant habitat features
- all riparian corridor widths specified in the SoC should be adhered to.

Overall, it is considered that the proposed modifications of the Concept Plan have limited environmental consequences beyond those which have been the subject of assessment under the Approved Concept Plan. Importantly, any limited environmental consequences or impacts associated with the proposed modifications can be appropriately managed and mitigated.

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Appendix A - Statement of Commitments

Table 9: Statements of Commitments relevant to ecological values

Current Statement of Commitment	Detail	Responsibility	Original CCP	Modified Plan
2 – Johnsons Spur Conservation Area	The Proponent will dedicate that part of the Johnston's Spur conservation area identified as Item E2 06 on the Land Ownership Options Plan included at Appendix H of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix I of the Preferred Project Report prepared by JBA Urban Planning Consultants Pty Ltd dated August 2010) to the Department of Lands free of cost and "under reserve" on a stage by stage basis, subject to the agreement of the Department of Lands to take ownership of this land. If the Department of Lands does not agree to take ownership of this land, the Proponent will identify a suitable alternative public or private land ownership option at the relevant subdivision stage. Any land to be transferred into public ownership in accordance with this commitment will be subject to an identified management regime. The land will only be transferred upon completion of any agreed embellishment and a suitable period of maintenance (eg. 3 years).	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Marked for retention Stage by stage basis for future works	Marked for retention Stage by stage basis for future works
3 – Environmental Reserves	The Proponent will dedicate the environmental reserves identified as Items E2 04 and E2 05 on the Land Ownership Options Plan included at Appendix H of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix I of the Preferred Project Report prepared by JBA Urban Planning Consultants Pty Ltd dated August 2010) to the Department of Lands free of cost and "under reserve" on a stage by stage basis, subject to the agreement of the Department of Lands to take ownership of this land. If the Department of Lands does not agree to take ownership of this land, the Proponent will identify a suitable alternative public or private land ownership option at the relevant subdivision stage. Any land to be transferred into public ownership in accordance with this commitment	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Marked for retention Stage by stage basis Contingent on future works	Marked for retention Stage by stage basis Contingent on future works

Current Statement of Commitment	Detail	Responsibility	Original CCP	Modified Plan
	will be subject to an identified management regime. The land will only be transferred upon completion of any agreed embellishment and a suitable period of maintenance (eg. 3 years).			
4 – Riparian Lands	The Proponent will dedicate the riparian corridor and adjoining open space/drainage lands identified as Items E2 01, 02 and E2 03, and RE1 01-02, RE1 04, RE1 09, RE1 12, RE1 15, RE1 22 and RE1 28 on the Land Ownership Options Plan included at Appendix H of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix I of the Preferred Project Report prepared by JBA Urban Planning Consultants Pty Ltd dated August 2010) prepared by JBA Urban Planning Consultants Pty Ltd dated August 2010 to the Department of Lands free of cost and "under reserve" on a stage by stage basis, subject to the agreement of the Department of Lands to take ownership of this land. If the Department of Lands does not agree to take ownership of this land, subject to the underlying land use zone, the Proponent will identify a suitable alternative public or private land ownership option at the relevant subdivision stage. Any land to be transferred into public ownership in accordance with this commitment will be subject to an identified management regime. The land will only be transferred upon completion of any agreed embellishment and a suitable period of maintenance (eg 3 years).	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Yes. Marked for retention Stage by stage basis Contingent on future works	Yes. Marked for retention Stage by stage basis Contingent on future works
28 – Ecology and Riparian	Riparian corridors that have been determined to have a requisite hydrological function will be retained generally in accordance with the Concept Plan Proposed Riparian Corridor Network drawing included at Appendix C of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010).	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Yes	Yes – ongoing. Requires action at each relevant stage
29	A riparian corridor of 92 metres total width will be provided to Marshall Mount Creek and to Macquarie Rivulet in accordance with the Concept Plan Proposed Riparian Corridor Network included at Appendix C of the Consolidated Concept Plan prepared	To be demonstrated by the landowner	Yes	Ongoing. Requires action at each relevant stage

Current Statement of Commitment	Detail	Responsibility	Original CCP	Modified Plan
	by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010).	/applicant at the time of any relevant detailed application		
30	A riparian corridor of 48 metres total width will be provided to streams extending from the main valley floor environmental corridors to Johnston's Spur in accordance with the Concept Plan Proposed Riparian Corridor Network included at Appendix C of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010)	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Yes	Ongoing. Requires action at each relevant stage
35	Vegetation Management Plans (VMP)s will be prepared for all works with land that has been identified as Concept Plan Environmentally Significant Land and within the Core Riparian Zones shown on the Concept Plan Riparian Corridor Network included at Appendix C of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix L of the Preferred Project Report prepared by JBA Urban Planning Consultants dated August 2010) generally in accordance with the principles of the Landscape and Open Space Masterplan included at Appendix G of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix CC of the Concept Plan Environmental Assessment Report prepared by JBA Urban Planning Consultants dated March 2010).	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Ongoing	Ongoing. Requires action at each relevant stage
36	Where Environmentally Significant Land and / or Core Riparian Zones are to be transferred into public ownership, the Proponent will rehabilitate that land in accordance with the VMPs to a suitable condition prior to any handover. Details of the rehabilitation to be undertaken in relation to each area of land, and of the likely ongoing maintenance requirements relating to weed management, bush regeneration and any asset protection zone maintenance of that land, are to be submitted with the relevant detailed application.	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Ongoing	Ongoing. Requires action at each relevant stage

Current Statement of Commitment	Detail	Responsibility	Original CCP	Modified Plan
37	A detailed survey will be carried out in an appropriate season for *Pterostylis gibbosa* (Illawarra Greenwood) prior to any works commencing within potential habitat for that species. Potential habitat for the species is the Lowland Wollybutt-Melaleuca. Following the further detailed survey work, any specific mitigation measures determined as required are to be addressed in the relevant detailed application(s).	Proponent to engage Environmental Consultant	Yes	Completed. Conducted by ELA in September 2012 and as part of each DA if suitable habitat present
38	Mature remnant habitat trees will be individually assessed prior to detailed design in the area identified on Figure 7 of the Flora and Fauna Assessment prepared by Ecological Australia and included at Appendix P of the Consolidated Concept Plan prepared by JBA dated March 2011 (previously referenced as Appendix Q of the SSS Study and Concept Plan Environmental Assessment Report prepared by JBA Urban Planning Consultants Pty Ltd and dated March 2010). Individual trees considered to provide significant habitat will be retained and incorporated into the design wherever practicable.	To be demonstrated by the landowner /applicant at the time of any relevant detailed application	Yes - preliminary designs included in CCP	Survey completed and retention options under consideration

ecological AUSTRALIA

ISO 14001 Environmental Management

AS/NZS 4801:2001 Occupational Health and Safety Management

ISO 9001 Quality Management

HEAD OFFICE
Suite 2, Level 3
668-672 Old Princes Highway
Sutherland NSW 2232
T 02 8536 8600
F 02 9542 5622

CANBERRA
Level 2
11 London Circuit
Canberra ACT 2601
T 02 6103 0145
F 02 9542 5622

COFFS HARBOUR
22 Ray McCarthy Drive
Coffs Harbour NSW 2450
T 02 6651 5484
F 02 6651 6890

PERTH
Level 1, Bishop's See
235 St Georges Terrace
Perth WA 6000
T 08 9227 1070
F 02 9542 5622

MELBOURNE
Level 1, 436 Johnston St
Abbotsford, VIC 3076
T 1300 646 131

SYDNEY
Suite 1, Level 1
101 Sussex Street
Sydney NSW 2000
T 02 8536 8650
F 02 9542 5622

NEWCASTLE
Suites 28 & 29, Level 7
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125
F 02 9542 5622

ARMIDALE
92 Taylor Street
Armidale NSW 2350
T 02 8081 2685
F 02 9542 5622

WOLLONGONG
Suite 204, Level 2
62 Moore Street
Austinmer NSW 2515
T 02 4201 2200
F 02 9542 5622

BRISBANE
Suite 1, Level 3
471 Adelaide Street
Brisbane QLD 4000
T 07 3503 7192

1300 646 131
www.ecoaus.com.au

HUSKISSON
Unit 1, 51 Owen Street
Huskisson NSW 2540
T 02 4201 2264
F 02 9542 5622

NAROOMA
5/20 Canty Street
Narooma NSW 2546
T 02 4302 1266
F 02 9542 5622

MUDGEE
Unit 1, Level 1
79 Market Street
Mudgee NSW 2850
T 02 4302 1234
F 02 6372 9230

GOSFORD
Suite 5, Baker One
1-5 Baker Street
Gosford NSW 2250
T 02 4302 1221
F 02 9542 5622

ADELAIDE
2, 70 Pirie Street
Adelaide SA 5000
T 08 8470 6650
F 02 9542 5622