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Modification Assessments NSW Planning & Environment
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Your Reference: MP10_0136 MOD1 Riverside

It is understood that the document on which this submission is based is a Modification to the Concept Plan, this Plan having been approved on 27th June 2013.

Abstract:

The modification document is substantial with proposed changes to major works encompassing the long-term development of the Riverside area and its environs. The boundaries to the various stages have been altered to modify the economics of the proposal, primarily on account of the amount of fill required to satisfy conditions required for housing construction. The boundaries to the conservation areas have been changed such that it can be claimed that all biodiversity credits (for Koalas) have been achieved on site. The inclusion of Koala credits will certainly contribute to their improved status and enhance the site but cannot be considered to maintain biodiversity.

The Eco-tourism changes have been cited but the explanation for 'what else and when' has not been given. On the other hand changes to land-use boundaries represent a high degree of multi-tasking for land use of an area linking development to conservation.

Changes to the layout of the property do not mention proposed screening but wax lyrical on the proposed surprise of an extension to a riverside walk as well as a strategically placed welcome sign. Changes to a staged development are driven by economics such that soil can be removed from A to be used in B and stored at C for later use for X. This will result in continuous attention needing to be given to stripping of vegetation, parking of vehicles and relocation of fill, at the same time the source of only 50% of the amount of fill required having been satisfied. No definite indication of the supply of the balance of fill has been supplied.

Changes to the Biodiversity Conservation Act from 1999 to 2016 factor in alterations to the Biodiversity intentions of the developer, to the point that legal advice has been sought regarding the permissibility of lodgement of a development application before establishment of satisfactory offsite offset biodiversity arrangements. There has however been a commitment to establish arrangements ahead of impacts occurring. There appear to be no arrangements between Sheargold and adjacent landowners to reduce the need for biodiversity offsite offsets via biobanking agreements.

Since the changes to stormwater management have moved well away from that which was approved in 2013, the advice of a truly independent expert should be sought. Changes to the need for road infrastructure improvements are substantial but it is claimed that nothing needs to be done until well into the future. The implication is that previous traffic surveys were flawed and there is less traffic now primarily because of "trip containment" due to 50% of the residents being over 60 years old. Of course if this is the case there will be no population increase brought about by these aged residents, such that population increments and its costs can be laid fairly at the feet of the housing industry.

There is a clear and present danger in electing not to upgrade the Toonang Drive intersection and immediately reduce the speed limit at the top of the hill from 80 kph to 50 kph.

Changes to Bushfire Management are thought to be inadequate as shown by the RFS current submission. RFS assessments should be non-negotiable.

Changes proposed for the keeping of cats indicate a lesson in logic is required for the developers.

Deletion of or change to future assessment requirements for ten independent criteria has the appearance of a last minute but very substantial shopping list!

Finally the Associated Changes to Statement of Commitments illustrates how very difficult it is for communities such as our own at Tea Gardens/Hawks Nest to analyse outcomes in the public interest!

The modifications proposed in this concept plan are substantial but do not in any way provide solutions for the conflicts between development and its integration into a ecological community without resulting in degradation of that community. Sustainability is the victim.

MODIFICATIONS:

The order of discussion of these **SIGNIFICANT** modifications does not reflect the importance and priority which I give to the individual concerns. It reflects only the order in which they were listed in the introduction to the NSW Planning document online. The Department's list is in **bold**, my comments have accents in *italics* and ***bold italics***

Changes to boundary of Concept Plan site, including exclusion of 10 Ha of conservation, public park, and eco-tourism land and inclusion of 6 Ha of commercial and residential land:

It would appear that these exclusions have been designed in part with the intent of

- ✓ making enough land area available to satisfy the Biodiversity Offsets for the Koala population ***onsite***. Unfortunately there is an equal area which requires accommodation for the remainder of the biodiversity represented not only by Koalas at Riverside. (see later).
- ✓ the exclusions reduce the *area* of available lots for sale in order to ***reduce the amount of fill required*** to satisfy the landfill requirements – this however has not resulted in a decrease in the number of dwellings – in fact the dwellings number was reduced by Crighton to approx. 800 and Sheargold now boast to only **725** lots – this, as shown in Fig 6 p21 of the summary doc. actually represents **935 dwellings**.
- ✓ the exclusions mentioned above enable house sites to be literally packed into a smaller area with no provision for open space within the built area other than one tiny area marked '*active recreation area*' Fig 1 p16
- ✓ there is one other recreation area which later in this submission will be noted also as biobank land and overburden bank, Fig 8 P35, as well as recreation, water management and road access.
- ✓ reference to past developments in other locations indicate the Sheargold family has formerly been associated with developments more conducive to residential amenity.

Deletion of eco-tourism precinct:

When questioned about the rationale for this decision the Sheargold presenter was unclear as to their intentions for future use of the area - one of the many decisions set aside by the developer for ***later-on***.

- ✓ all that can be learnt from maps provided is that this area is not part of the approval,

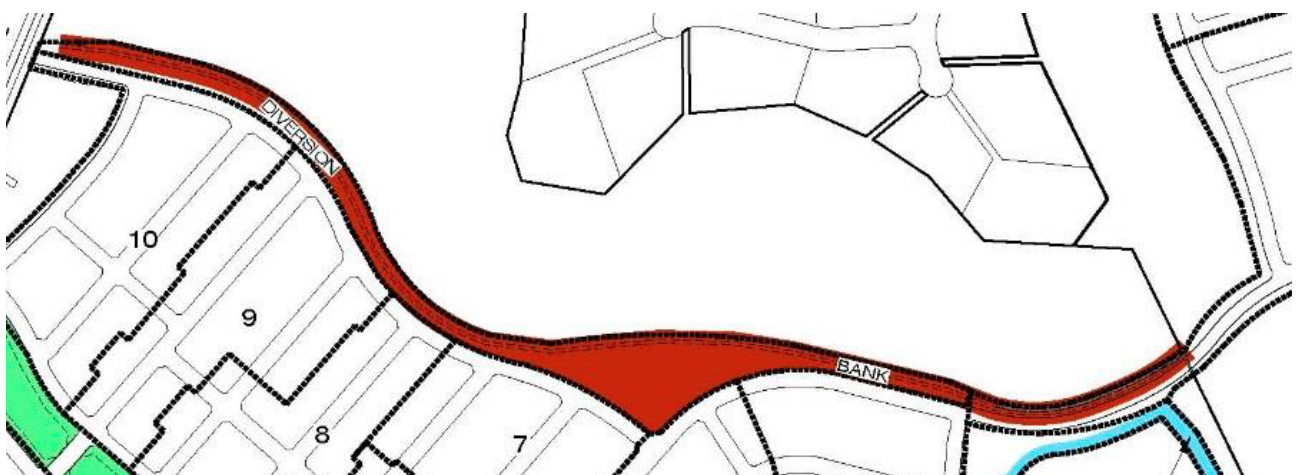
it fronts the Myall River and supports a private residence involved with the development.

- ✓ it is noted from Fig 6 that the dwelling on this particular property has access to a public road in the Shearwater estate, access to which will be obliterated by development works.
- ✓ *it would seem necessary that the intent for this location be determined before final development approval.*

Changes to land use boundaries within the site:

As stated before, the number of dwellings to be provided has increased to 935 and the area for these has been reduced which reduces land fill requirements and provides Koala credits. Other specified usage is for drainage and storage of overburden. One particular area is shown with multiple uses – *indicated as green, then blue, then red:*

- ✓ Fig 1 P16 (**site area**) shows one of the two designated *active recreation area(s)* (pale green) separated from the conservation area (darker green) by the development footprint boundary
- ✓ Fig 4 P19 (**changes to footprint**) shows the same area (pale green) as part of that now intended for *addition to the Biobank*.
- ✓ Fig 5 P20 (**overall landuse**) shows the same area (now blue) as part of that set aside for *recreation and water management*.
- ✓ Fig 6 P21 (**layout for indicative staging**) shows a road in the same area, leaving the stage 15/16 area and providing *road access to Toonang Drive*.
- ✓ Fig 8 P35 (**bulk earthworks plan**) shows the same section referred to in Fig 1 (now red) denoting a *Diversion Bank constructed from 21,980 m³ of fill*.
- ✓ concurrently (for the children?) we have active recreation, Koalas, water features, access road and diversion bank ?



From Fig. 8 Bulk Earthworks Plan P35

Changes to road layout, proposed bus routes and cycleway, and provisions of riverside walk.

Very little information was given on internal roads at the PA meeting. For external roads we were told Council may provide traffic lights in the future. Much of the time spent by the Sheargold presenter on this modification was given to the “surprises” planned for the community - a riverside walk, as well as a sign at the entrance to the town on the corner of Toonang Drive and Myall Way.

- ✓ community members still remember the 9 hole golf course touted by previous developers – this did not materialise.
- ✓ the community expressed concern about plans (are there any?) to screen the development from those entering the town. At the present time the land is screened by remnants of the pine plantation that was at one time there, and also by the native vegetation endemic to the site having escaped the regular slashing that the property has undergone for many years.
- ✓ the community was also concerned that the riverside walk was intended to be extended to those lands set aside for re-establishment of the sensitive ecological successions that have been obliterated in the past
- ✓ Sheargold assured the community that the boardwalk planned would be enjoyed by thousands and that it would be indestructable – in their experience other boardwalks they have built have survived the attempts of vandals to incinerate them!!

Changes to development staging, and to requirements relating to bulk earthwork staging.

Fig 9 P36 shows comprehensively where fill is required to increase the level for housing construction. It does not however explain any technical difficulties that may be associated with removal of soil from stages 15/16, and from where the balance of the fill is intended to be sourced

- ✓ figure 9 indicates that 237 thousand cubic metres can be won from stages 15/16
- ✓ there does not appear to be any reference to drill core geology with respect to the ability of this area to provide material to a *depth of 3 metres*. Anecdotally there exists in this area *indurated sands* (coffee rock) which may significantly interfere with soil excavation.
- ✓ figure 9 also indicates that a total of 599 thousand cubic metres of fill are required for the entire development, leaving a *deficit of 312 thousand cubic metres* after a select import of 50 thousand.
- ✓ one cubic metre of fill is equivalent to 1.5 tonnes and estimating that one truck load is 33 tonnes this computes to 14,200 truck movements into Tea Gardens from wherever the fill is sourced (**28,400 truck movements in all**)(see later comment).
- ✓ it has been suggested that dredging The Gut in the Myall River downstream of the development would provide fill in lieu of this traffic imposition!
- ✓ it is a given that ***all trees will be removed to accommodate staged housing*** and it is difficult to imagine that the amount of stripping, excavation and heavy vehicle movements will not necessitate the removal of the remaining trees on the property, the trees that have provided essential foraging and hollows for the sustainability of

the ecology of the area: From Fig 9 see next page (after magnification):

ALL WORKS TO THE NORTH OF PROPOSED ACCESS
ROAD TO BE KEPT TO THE MINIMUM POSSIBLE TO
STABILISE PROPOSED ROAD PAVEMENT AND ESTABLISH
ROADSIDE SWALES/BUNDS FOR WATER MANAGEMENT.
EXISTING TREES TO BE AVOIDED WHEREVER POSSIBLE

- ✓ within [Annex C Traffic Impact Assessment Riverside Tea Gardens TIA.pdf](#) it is stated that “an important element for construction work will be managing the vehicles associated with the construction staff(who) can be *directed to park within the site and the overall area of the site will allow this to happen*”.
- ✓ these comments do not bode well for the stripping of understorey vegetation, the removal of trees and destruction of vegetation by the sequential, staged relocation of parking and manoeuvring areas for vehicles involved in the construction of house-sites associated with the establishment of the 16 staged development areas .

Modifications to Biodiversity offsets package:

Sweeping changes were proposed to the NSW Government's Biodiversity and Native Vegetation legislation for October 2016. These include the repeal of the 2003 Native Vegetation Act, the repeal of the Threatened Species Conservation Act 1995 and the repeal of the Nature Conservation Trust 2001 and parts of the 1974 NPWS Acts.

These reforms will bring about two major impacts:(Ref, Herbert, Smith, Freehills Lawyers www.hsf.co/insight/legal-briefing).

- ✓ redefine controls applicable to land clearing.
- ✓ reconfigure determination and regulation of biodiversity offsets.

Has the production of this current Mod Concept plan application been in any way affected by these two impacts ? Or was the lodgement of the application so close to the change in legislation a pure coincidence?

In any case, relative to these impacts:

- ✓ Sheargold has emphasised that all Koala offset credits have been satisfied onsite.
- ✓ page 43 2.7.1.1 states: 'the preferred development footprint is 10.4% smaller than the DoP approved development footprint and results in a 38.8% decrease in the number of ecosystem credits required'.
- ✓ other flora and fauna will not have their biodiversity offset credits satisfied onsite. Established mature trees, especially those in the housing development footprint will be felled resulting in loss of tree hollows and nesting and foraging locations.
- ✓ the impacts of clearing on biodiversity are intended to be *offset offsite* via arrangements for the management of species elsewhere as a Biobank offset equivalent.
- ✓ no commitment has been made as to where or when these arrangements will be established other than the statement that *they will be provided later-on ahead of*

impacts occurring.

- ✓ with respect to the last modification in the list “**associated changes to statement of commitments**” it is noted here that legal advice was sought for the removal of restrictions on development prior to establishment of offsets and biobanking agreements (see later)
- ✓ it was mentioned by an attendee during the Sheargold presentation at the PA meeting that Durness (North Shearwater), being immediately adjacent, was a possible offsite offset location.
- ✓ the proponent discussed the fragmentation of ownership of available lands and discounted suggestions from the community as to the possibility of cooperation between adjacent land owners to extend and enhance wildlife corridors.
- ✓ it is of interest to read the original assessment report from Great Lakes Council dated March 2012, which resulted in the 2013 approval - Ecology: “ **Biobanking offsets must be sourced within the Great Lakes LGA so as to provide a benefit for the local area**”.
- ✓ from Annexures [Annex K_GLC Confirming possible arrangements for Biodiversity Lands.pdf](#) it has been learned that in March 2016 correspondence with Bob Lander representing Sheargold seems to indicate that GLC is pleased with the establishment of their biodiversity offsets. Text of a letter from GLC states that “**it is pleasing to hear from you that the Biobanking Assessments have now been completed for the Riverside Development at TG for the Sheargold Company**” and “**we understand that Sheargold intend to create a subdivision of the land to form the Biobank Area at the first stage of the development.**”
- ✓ the letter goes further to applaud the fact that “**the outcome is positive and beneficial....will have significant environmental value....and will result in a connection between Kore Kore Reserve, Shearwater Public Reserve and North Shearwater proposed reserve.**
- ✓ From the PA meeting it is now clear that this does not refer to half of the offsets which it is the intent of the developer be determined offsite – somewhere at some time during construction, at stage 7? but not at Durness? Have they been contacted?
- ✓ without local offsets, other than those determined by Koalas, ***local extinctions are considered to be the result as the biological integrity of the area will be lost***, this integrity being of course the very quality that has brought people to this area.
- ✓ it is unfathomable that professional associates in the development business can believe that retaining one species habitat area and causing the removal of others to far away locations is in any way constructive for maintenance of local biodiversity.
- ✓ if this integrity is lost as a result of pressure on a stressed, fragile environment including the Myall River and the diminishing amounts of native vegetation available for support of our endemic species **all that remains** is a money making venture putting new residents in an area ***without adequate roads and public transport, not a wide variety in employment opportunities, no high school and a one hour 79 km ambulance trip to the nearest public hospital.***
- ✓ A species list including threatened species (both vulnerable and endangered) was provided in the original Riverside application – it is by no means totally inclusive and can be added to by the sightings over 12 years by local residents. This list is included as an appendix at the completion of this submission.
- ✓ it is considered that the applicant must recast the biodiversity offset proposal in its entirety, to reflect the conservation needs of species in this significant environment.

Amended stormwater and groundwater management:

This is a contentious and complex matter to comment upon, needing engineers versed in the discipline. At the Progress Association meeting, proponents of the Modification indicated that there would be no problems because some water would permeate into the sand, while runoff would comprise purified fresh water.

- ✓ this claim was of concern to residents of Myall Quays, whose water frontages are currently of sufficiently salty water that they support estuarine fishing – rainfall here is abundant and it seems quite likely that runoff will result in the dilution of this salt water.
- ✓ big rain events and their *effects on the speed of runoff* are common to the area and in the absence of retention basins the water from Shearwater Estate added to the water from a concentration of roofs and hard surfaces in the staged areas of Riverside could pose a problem despite the purification facilities.
- ✓ in the previous application government officers took exception to the Crighton proposals relating to stormwater and groundwater control and it is considered that their attention needs to be directed towards the latest proposals with the expansion of Myall Quays over the last eight years.
- ✓ it is of some concern that the major watercourse in the Shearwater Estate, Shearwater Creek, has not been acknowledged in any map in this approval doc. Provision has been made in the plans approved for the North Shearwater subdivision to protect and enhance the watercourse, which ultimately finds its way under Toonang Drive and into Riverside.

Apart from that, my disciplines are in Biochemistry and Zoology - I will leave expert commentary on storm water and groundwater management to others.

Changes to provision of road infrastructure upgrades:

The Sheargold Modification application indicates that there will be no impact on trafficability of local roads, even when their development site is fully occupied despite the possibility of the entire population of Tea Gardens and Hawks Nest being increased by 100% were there to be an average of three occupants per dwelling.

- ✓ the no-impact claim appears to have been made on the basis of traffic surveys which have been prioritised to “peak times” in the morning and afternoon.
- ✓ traffic volumes are represented as having actually decreased over the several years between the surveys conducted for Crighton and for Sheargold.
- ✓ however “*peak times*” in Tea Gardens/Hawks Nest occur at times relative to the occupations and activities of the mix that represents the present and future population.
- ✓ referring again to the Sheargold Annex [Annex C Traffic Impact Assessment Riverside Tea Gardens TIA.pdf](#) the SECA reference to the mix of residents found in
- ✓ (section 4.1) that live in the TG/HN area is quite correctly used as a reference for determining traffic volume
- ✓ “retired people 60yo+) make up 49.7% of the local residents” *they report*, “indicating a very low demand for external traffic movements associated with work trips to/from the locality”
- ✓ so they say it follows that “**the trip generation rate should be discounted from the**

standard rate, to allow for retired residents.....and trip containment!!!

- ✓ *if it were not so serious we would be laughing!*
- ✓ *what a phrase to tell the grandchildren in HK, Sydney and Newcastle – sorry I cannot make it for babysitting today as I am suffering from **trip containment**.*
- ✓ *seriously though us retirees are at least as busy as we were before retirement and make regular and irregular use of our roads for a variety of activities, concerts, appointments, volunteering and commitments taking us to various locations.*
- ✓ *The doc. also says “**there is considerable scope for walking and cycling trips**” thereby reducing traffic. *It is unlikely that very many of these retired persons would walk or cycle to the River or the Beaches some 7 km away for their morning laps and we will continue to take our cars to the natural waterways for this purpose.**
- ✓ *As a member of the retired group referred to above I need to report that my trips may well be determined by avoiding peak times but this fact does not reduce the number of road users and the possible risks they may encounter from badly maintained roads and traffic hazards such as speeding, loaded construction vehicles, particularly those travelling downhill towards Toonang Drive.*
- ✓ *in view of the construction traffic that this proposal must generate on public roads as well as internal roads reported by the development, **before approval is granted the speed limits on the main road, Myall Way, from the Lookout at the Lions Club Park, needs to be changed from 80kmph to 50kmph for the safety of the present day as well as future residents (especially on account of the proposed staging of the development.)***
- ✓ *in addition, slip lanes must be provided to the east and west of the Toonang Drive intersection, to provide for the possibility that the speed limit would not be observed by the fully loaded vehicles travelling down **what is a steep and curving hill**. This would allow vehicles to pull from the “line of fire” before entering Toonang Drive*
- ✓ ***the developer has ignored the Toonang Drive intersection despite there being an entrance to his development from Toonang Drive shown on the maps provided, for later-on?***
- ✓ *however this comment is **rather strange** - in the SECA section 4.4 of the traffic Annexure [Annex C Traffic Impact Assessment Riverside Tea Gardens TIA.pdf](#) - “the intersection of Viney Creek Road and Myall Street will be upgraded with a sheltered right turn lane which will allow through traffic movements to continue with minimal delays as right turning traffic can prop in the sheltered right turn lane” **Oh dear, the developer and the traffic surveys must have missed the fact that the company Mineral Deposits provided this right turn lane in 1986!***
- ✓ *with respect to the proponents assertion that there may be a future need for traffic signals – if there are to be no pressures on traffic, why would such infrastructure be needed?*
- ✓ *even if and when these were needed, it is argued by the proponent, that it would all be taken care of by way of Section 94 contributions. *That means the developer would make a contribution towards the cost and the Council would provide the balance, sourced from Council Rate Revenue.* It is fair to state that this has almost never occurred to date, simply because almost no Council in NSW can afford to make their contribution, for whatever reason. *It is essential that the proponents must sort this out before approval can be given, along with a representative traffic generation assessment - essential in that the **28,400** estimated truck movements for provision of the imported fill will seriously damage the roads.**
- ✓ *if the source of the fill is to be the *Hunter Quarry at Karuah*, the whole of Myall*

Way, a road constructed largely on alluvial material, will be damaged. A levy would need to be applied to such truck movements.

- ✓ when questioned on this matter at the PA meeting the presenter alluded to the possible use of the ***Myall Downs Quarry in Tea Gardens***, which I understand is privately owned and operated and in use for local construction, possibly necessitating it nearing its approval limits, perhaps due to its proximity to Kore Kore Creek which flows into the Myall River.

Changes to bushfire management and change to servicing:

The submission posted on the NSW Planning web site indicates that the RFS does not support the proposed modification to the concept plan – the details of this are supplied in the RFS submission. This lack of support did not appear to be a problem for the developer's representative when asked about it at the PA meeting.

- ✓ maintenance of asset protection zones is a serious consideration and state government guidelines and RFS assessments should be non-negotiable.
- ✓ *for the future residents of North Shearwater, and those in Shearwater, a significant consideration is fire behaviour.* My considerable personal experience as a rural fire service member for 25 years allows me to understand fire behaviour and the dangers when it traverses bushland in an uphill direction fanned by SE winds and ultimately making its own updraft – the very scenario that would confront us were a fire to begin at Riverside.

Modifications to enable keeping cats on site:

The logic attempted to be applied to this modification request by the developer defies the principles of basic reasoning.

- ✓ *because it is the case there, it should also be allowable here???*
- ✓ *because there are 400 cats in the area we should allow cats at Riverside???*
- ✓ *conversely cat ownership is not allowed in Precinct One, North Shearwater, so why should cat ownership be allowed in Riverside.*
- ✓ *many cat owners care for their cats and the environment but this is no guarantee that many more cat owners will do the same*
- ✓ in fact the Sheargold argument should be as follows: ***we have managed to obtain all Koala credits onsite and will endeavour to knock as few trees down as possible, not destroy the understorey vegetation with our heavy equipment and as good environmentalists we will not permit cat ownership.***

Deletion or changed future assessment requirements relating to groundwater, stormwater, heritage, flooding, bushfire, acid sulfate contamination. Environmental management, sewer and water supply, traffic noise.

The planning proposal for LESS information on public registers will make it difficult for communities such as our own at Tea Gardens/Hawks Nest to analyse environmental outcomes in the public interest!

- ✓ this multitude of unrelated deletions and changed future assessments *looks like a last minute shopping list!*
- ✓ it is impossible at this stage to analyse, in this submission, such changes mentioned by the developer in this multitude of deletions and changed future assessments for this *substantial* modification approval.

Associated changes to Statement of Commitments:

The only reference that I can find to Statement of Commitments amongst the 500 or so pages of Annexures is in [Annex N Legal Advice.pdf](#) which is a letter written to the Sheargold Group by GADENS. Sheargold had asked for advice on the modification of Part 3A Concept Plan, as to “whether it is possible to modify [the plan] in respect to condition A5 which precludes any development applications being lodged prior to various biodiversity offsets being secured.” In the letter it was noted that the offsets are to be secured before construction commences but they would like to be able to lodge a development application *“before the offsets are secured”*

Part of the GADEN legal reply is as follows:

“It is, in our view, open to the proponent to seek to modify the approved statement of commitments. An application to modify the timing proposed for securing offsets in the statement of commitments would need to *justify why the new timing is reasonable and does not create unreasonable uncertainty*. Such modification should be approved if it is demonstrated that the offsets will be able to be secured at a future date and that the development will not be able to proceed until this is achieved.

As you propose that the offsets must be secured prior to the issue of a construction certificate, there is no risk the development will go ahead before this is resolved.

In the present case, you would seek to delete the deferred commencement nature of condition A5, so the modified condition would cease to be a condition falling within s 750(5) and would instead operate as condition under s 75P(2) (a1), which provides:

(a1) any consent granted for the project or that stage of the project under Part 4 is to be subject to such conditions as the Minister directs for the purpose of fulfilling the obligations in a statement of commitments submitted by the proponent (in which case those conditions cannot be modified without the approval of the Minister and a person cannot appeal to the Court under this Act in respect of the direction or any such conditions imposed by the consent authority),

This would mean that the concept plan approval should require that any future development consents granted for the development must impose a condition requiring the relevant offsets to be secured prior to the issue of a construction certificate.

- ✓ none of these changes to commitments correspond to any discussion with or commitments given to the community at the PA meeting. These legal discussions of commitments continue into the second page of the Annex N letter but my understanding of the intent of the reply is that *the required commitment is that biodiversity offsets be secured prior to final approval of the concept plan.*
- ✓ at the meeting Sheargold representatives were at pains to iterate and reiterate that Koala offsets had been satisfied on site.
- ✓ they were however non-committal as to the location of offsite offsets or credit arrangements on account of the unaccounted for Riverside flora and fauna, including those spp. classified as threatened.
- ✓ the Mod doc. states that *these will be provided later-on “ahead of impacts*

occurring”.

From Ronnie Nichols B.Sc. (Zoo/Biochem)UNSW Grad Dip Ed in Sc. (U.Syd.)

Appendix of native species endemic to Riverside and the adjacent Shearwater, Tea Gardens.

PRELIMINARY ENVIRONMENTAL ASSESSMENT Crighton Properties Pty Ltd

Riverside at Tea Gardens Concept Plan

Preliminary Environmental Assessment

August 2010

Reference: 0043707 PEA D02

4.1 ECOLOGY

4.1.1 Overview

The site has been subject to numerous flora and fauna studies. Several vegetation mapping studies have been conducted across the subject land and surrounds, including broad scale mapping across the Great Lakes LGA as well as fine scale mapping of the subject land. Detailed vegetation mapping was undertaken by Conacher Environmental Group (Conacher) in 2007. Fauna surveys have been conducted on the subject land over the past two decades, most recently in 2007 and 2008 by Conacher. Cumberland Ecology (2010a) recently conducted additional vegetation surveys to revise and update the vegetation mapping prepared by Conacher. Cumberland Ecology also recently undertook an Ecological Assessment of the proposed development (2010b).

4.1.2 Vegetation Communities, Fauna Habitat and Movement Corridors

Vegetation Communities

Additional vegetation surveys and mapping undertaken by Cumberland Ecology were conducted from 14 to 16 December 2009, 13 to 15 January 2010 and 10 February 2010 in accordance with the standards provided in the (then) DEC Threatened Biodiversity Survey and Assessment Guidelines for Development and Activities (Working Draft) (DEC (NSW), 2004) and BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECC, 2009). Habitat assessments were undertaken in accordance with the methodology within the BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECC, 2009).

The mapping identified that the vegetation on the site includes a mosaic of woodland, forest, scrub, heath, grassland and wetland with the mosaic reflecting topography, drainage and land use. The vegetation was categorised into three broad native vegetation groups and one exotic vegetation group, with each vegetation group containing a suite of vegetation communities (16 in total) that are readily distinguishable by the dominant canopy species present:

- Dry forest / woodland:
- Eucalyptus pilularis Open Forest;
- Corymbia maculata – Eucalyptus paniculata Open Forest;
- Eucalyptus umbra Open Forest;
- Eucalyptus microcorys Open Forest; and
- Eucalyptus signata Woodland.
- Wet forest / woodland / scrub / heath:
- Corymbia gummifera Open Forest;
- Angophora costata – Eucalyptus resinifera Woodland;
- Eucalyptus robusta Woodland/Open Forest;
- Wet Heath;
- Casuarina glauca – Melaleuca Regrowth Forest;
- Melaleuca quinquinervia Forest; and
- Melaleuca ericifolia Scrub.
- Wetland communities:
- Casuarina glauca Forest;
- Baumea juncea Rushland;
- Juncus kraussii Saltmarsh; and
- Avicennia marina Mangroves.
- Exotic Communities:
- Pine Forest;
- Exotic Grassland/Pasture; and
- Disturbed Estuarine Vegetation.

Several of the vegetation communities recorded corresponds to the following endangered ecological communities (EECs) listed under the TSC Act:

- Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions;
- Swamp Sclerophyll Forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions ; and
- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions.

Cumberland Ecology concluded that a high proportion of the site contains native vegetation that will require offsetting (2010a).

Fauna Habitat

Vegetation within the site provides potential habitat for a range of native vertebrate fauna species, including amphibians, birds, terrestrial and arboreal mammals, bats and reptiles. Key habitat features recorded by Cumberland Ecology (2010b) include:

- wetland and riparian environments which provide habitat for wetland birds, frogs and reptiles;
- ground cover, leaf litter and fallen timber suitable as shelter for small terrestrial fauna species;
- tree hollows suitable as shelter and nesting habitat for a range of hollow dependant fauna;
- Koala feed tree species; and
- blossom-producing trees suitable for foraging for a range of nectivorous species.

Wildlife Corridors

The site has been mapped as forming part of a regional corridor and as a key habitat area. The site forms part of the Nerong - Pindimar regional corridor, which provides a link between Nerong Waterholes and Kirks Knoll. The

regional corridor extends from the west to north east and covers the central and northern thirds of the site. Detailed examination of the vegetation and landscape of the site indicates several potential local movement corridors for wildlife (Cumberland Ecology, 2010b).

4.1.3 FAUNA OBSERVED OR LIKELY TO OCCUR

Fauna surveys of the site have resulted in the detection of over 200 vertebrate species, including 20 amphibian, 125 bird, 43 mammal and 15 reptile species. A number of threatened fauna species listed under the TSC Act and EPBC Act are known to occur within the locality. The following threatened fauna have been recorded on the site:

- Wallum Froglet (*Crinia tinnula*);
- Varied Sitella (*Daphoenositta chrysoptera*);
- Little Lorikeet (*Glossopsitta pusilla*);
- Black Bittern (*Ixobrychus flavicollis*);
- Osprey (*Pandion haliaetus*);
- Barking Owl (*Ninox connivens*);
- Squirrel Glider (*Petaurus norfolcensis*);
- Koala (*Phascolarctos cinereus*);
- Grey-headed Flying-fox (*Pteropus poliocephalus*);
- Common Blossom-bat (*Syconycteris australis*);
- Little Bentwing-bat (*Miniopterus australis*);
- Eastern Bentwing-bat (*Miniopterus scribersii oceanensis*);
- Eastern Freetail-bat (*Mormopterus norfolkensis*); and
- Greater Broad-nosed Bat (*Scoteanax rueppellii*).

All these species are listed as Vulnerable under the TSC Act.

The Koala also forms part of an endangered population in the Hawks Nest and Tea Gardens area.

The Grey-headed Flying-fox is also listed as Vulnerable under the EPBC Act (Cumberland Ecology, 2010b).

4.1.4 Threatened Species

Over 500 flora species have been recorded on the site, approximately 85% of which are native. No threatened flora species have been detected within the site (Cumberland Ecology, 2010b).

4.1.5 Summary of Potential Impacts

The primary impact resulting from the proposed development is vegetation clearance. The total development footprint is approximately 222.5ha, of which 132.1ha comprises open space and 90.4ha comprises built upon area. Approximately 65.64ha of the vegetation to be removed from the development footprint is comprised of Swamp Sclerophyll Floodplain Forest EEC. The following key threatening processes are applicable to the development:

- clearing of native vegetation;
- loss of hollow-bearing trees;
- removal of dead wood and dead trees; and
- alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands.

The Riverside at Tea Gardens development will reduce the widths of potential local movement corridors for wildlife, constituting dispersal, foraging and nesting habitat for a range of fauna groups, particularly birds and small medium sized mammals.

An Ecological Site Management Strategy has been developed for the site to mitigate the impacts of Riverside at Tea Gardens on biodiversity.

An Integrated Water Management Plan has also been developed for the site to mitigate the impacts of Riverside at Tea Gardens on hydrological regimes.

Additionally, a biodiversity offset area is proposed adjoining the Myall National Park approximately 2 km north east of the site (refer to Figure 1.2).

4.1.6 Proposed Assessment Methodology

The site has been subject to numerous flora and fauna studies, including recent vegetation mapping undertaken by Cumberland Ecology (2010a). The results of previous surveys will be detailed in the Environmental Assessment, together with the recent Ecological Assessment Report prepared by Cumberland Ecology (2010b).