Prepared for:

Civil Lake on behalf of Lake Macquarie City Council

Submissions Report

Sustainable Resources Centre - Teralba

January 2011

Submissions Report, Sustainable Resources Centre, Teralba

Prepared for

CiviLake on Behalf of Lake Macquarie City Council

Prepared by

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List of Abbreviations

AQIA	Air Quality Impact Assessment
ARI	Average Recurrence Interval
ATS	Australian Traffic Services
CEMP	Construction Environmental Management Plan
DECCW	NSW Department of Environment, Climate Change and Water
DoP	NSW Department of Planning
DP	Deposited Plan
EA	Environmental Assessment
ENM	Excavated Natural Material
ECRTN	Environmental Criteria for Road Traffic Noise
EEC	Endangered Ecological Community
EP&A Act	NSW Environmental Planning and Assessment Act 1979
LGA	Local Government Area
OEMP	Operational Environmental Management Plan
PB	Parsons Brinckerhoff Australia Pty Limited
PSNL	Project Specific Noise Level
OU	Odour Units
RBL	Rating Background Level (RBL)
RTA	Roads and Traffic Authority
SEPP	State Environmental Planning Policy
SoC	Statement of Commitments
TPA	Tonnes Per Annum
VENM	Virgin Extracted Natural Material
WCMP	Water Cycle Management Plan

1.0 Introduction

1.1 Overview of Proposal

CiviLake (a business unit of Lake Macquarie City Council) proposes to develop and operate a Sustainable Resource Centre (referred to as the proposed Facility) on a Site at The Weir Road, Teralba, known as Lots 42, 43, 53 and 54 in Deposited Plan (DP) 16062.

The proposed Facility would be a crushing, grinding and separating operation for construction and green waste materials including concrete, asphalt, recycled asphalt pavement, road base, green waste, bricks, tiles and soil. The proposed Facility would accept up to 200,000 tonnes per annum (tpa) of construction and green waste material for reuse within CiviLake operations and resale to the construction industry.

The project will significantly decrease both the amount of virgin materials Council is required to purchase for its civil works and the volume of construction waste Council disposes to landfill, providing a dual economic and environmental benefit.

The site of the proposed Facility has an area of approximately 7 hectares and is located approximately 2km north of the village of Teralba on a floodplain to the south and west of Cockle Creek. The site will be accessed from a new entry intersection with the Weir Road which adjoins the southern boundary of the site. The site is currently used for light agriculture (agistment) and is elevated approximately 1m relative to the adjoining land, due to the previous land use of sanitary disposal involving the deposit of biosolids and fill over the site. The site level is proposed to be further raised through filling to cap existing contamination, raise the site above flood levels and facilitate appropriate water management.

The site has been designed in order to enable the practical requirements of the proposed Facility's operation and to minimise the potential impacts of the proposal on the surrounding environment.

1.2 Statutory Context

The Minister for Planning has declared that the project is a project to which Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) applies. In accordance with the requirements of the EP&A Act, an environmental assessment (EA) was prepared to assess the potential impacts of the proposed Facility.

1.3 Environmental Assessment Exhibition

The EA was on display for 37 days from 26 August to 1 October, 2010.

The EA was made available on the Department of Planning (DoP) website (www.planning.nsw.gov.au), and was exhibited at several exhibition venues as stipulated by the DoP.

1.4 Purpose of this Report

During the exhibition of the environmental assessment, 8 submissions were received. The DoP provided copies of the submissions to CiviLake. In accordance with section 75H(6) of the EP&A Act, the Director-General of the DoP requires CiviLake to address the issues raised in the submissions. Should the response to a submission require changes to the project to minimise its environmental impact, a preferred project report is to be prepared and the Statement of Commitments to be revised.

This report identifies the issues raised during exhibition of the EA and provides CiviLake's responses to those.

The responses to the submission have not required changes to the project, and hence a preferred project report is not required.

2.0 Issues Raised and Response

This section describes the issues raised from submissions to the Environmental Assessment.

Of the 10 submissions were received:,

- 1 was from the Department of Planning requesting additional information in relation to aspects of the proposal;
- 3 were from private individuals;
- 1 was from Concrush, a company which operate a concrete recycling facility in the Teralba area.
- 6 were from government departments / authorities as follows:
  - Department of Environment, Climate Change and Water (DECCW) - containing recommended conditions of approval
  - Roads and Traffic Authority (RTA) - stating no objection to the proposed development
  - Office of Water - stating no objection to the proposed development
  - Hunter Water - reiterating advice in relation to water supply to the site and)
  - Rural Fire Service – including a minor comment in relation to bushfire management
  - Hunter Regional Development Corporation – focusing on local traffic management. .

Responses to the submissions are provided in the following sections. No responses were required to the RTA, Hunter Water and Office of Water submissions. Copies of the submissions are provided in Appendix A of this report. A revised SoC is presented in Appendix B.

2.1 Department of Planning Submission

2.1.1 Noise

No.	Comment	Response
DoP1	*The data noise logger used to monitor ambient and background noise levels were at the site rather than the nearest sensitive receivers. Please Justify.*	The logger was placed on the site because the site is vacant and is well removed from urban and industrial noise sources. The surrounding residential receivers are either equally affected or more affected by urban noise and traffic noise, therefore, the Rating Background Level (RBL) determined is conservatively low and the corresponding Project Specific Noise Levels (PSNLs) are also conservatively low. In the case of the nearby receiver on Weir Road (approx 800m from the proposed Facility), the logger was located on a part of the site which excludes traffic noise from Weir Road from the background noise level. In the case of receivers in Edgeworth (approx 700m from the proposed Facility), traffic noise and urban hum is also excluded from the background levels. The PSNLs determined for the project are, therefore, conservatively low.
DoP2	*Did the noise assessment take the 3m change in site level into consideration?*	All recommended treatments are set to be above the actual finished site level. Changes to the site level have been built into the acoustic model.

No.	Comment	Response
DoP3	*Clarify why the existing noise levels on York Street are high. Was monitoring undertaken and if so where?*	The existing traffic noise levels shown in the *Acoustic Assessment Report* at York Street are calculated peak one hour traffic noise levels based on the traffic volumes in the absence of the proposed development predicted by the traffic report for 2022. The calculated noise levels are a direct result of the traffic volumes predicted to use the street in the peak period in the day. The traffic noise levels have not been measured in York Street but levels have previously been measured in Railway Street which links York Street to Rhonda Road and the measured levels are consistent with the predicted level in York Street. As part of the additional assessment requested by the DoP, a measurement of existing traffic noise levels was conducted at York Street (Refer to Appendix C). The results were consistent with those predicted in the *Acoustic Assessment*.
DoP4	*Clarify what is meant by after hour's delivery, between what times.*	Operational hours and after hours deliveries are described in Section 2.13.2 of the EA. The proposed Facility is proposed to operate crushing and processing works Monday to Friday between 7:00am and 6:00pm and on Saturdays between 7:00am and 1:00pm. No processing of incoming material would be conducted at night or on Sundays or public holidays. After hours deliveries are any deliveries out of the above defined operating hours and will be limited to 50 nights per annum. The after hour's deliveries would be required to cater for delivery of materials from CiviLake site works carried out at night, where construction and maintenance work times are defined by the RTA. The majority of after hour's deliveries would be before midnight but a smaller percentage would be after this time. Receipt of materials on Sundays and public holidays is proposed between 8:00 and 5:00pm as CiviLake is committed to minimising disruptions associated with work on community projects operational during the week e.g. schools and commercials areas.
DoP5	*Provide an assessment of traffic noise impacts on Barnsley Public School as well as residents along The Weir Road and Northville Drive.*	An assessment of traffic noise impacts on Barnsley Public School as well as residents along the Weir Road and Northville Drive has been undertaken by Hunter Acoustics and is presented in Appendix C of this report. The predicted noise levels for 2022 show increases in traffic noise due to the development for these receptors within the increases allowed under the DECCW ECRTN.

No.	Comment	Response
DoP6	*Note: York road is a local road with an ECRTN criteria of LAeq(1hr) 55dB(A) day and LAeq(1hr) 50dB(A) night*	Hunter Acoustics has advised that in accordance with , Section 2.2 of the Environmental Criteria for Road Traffic Noise (ECRTN) classification categories for roads (describing the road usage and function), York Street cannot be classified as a 'Local Road'. A Local Road is defined as: "*the subdivisional roads within a particular developed area. These are used solely as local access roads."* For the purposes of the acoustic assessment, it is considered that the 'local road' definition does not fit York Street as it provides a link between Toronto Road/ Five Islands Drive to access Barnsley via Racecourse Road and is also used as a heavy vehicle access for the existing Metro Mix Quarry and to access the suburb of Wakefield via Railway Street and Rhonda Road. Therefore, it is considered that the correct classification for York Street is either:- as a "Collector Road" which is defined in the ECRTN as roads that:- "*connect the sub-arterial roads to the local road system in developed areas*" or as a "sub-arterial Road" which is defined in the ECRTN as roads that:- "*Connect the arterial roads to areas of development and carry traffic from one part of a region to another". (i.e. Teralba to Barnsley and Teralba to Wakefield) "They may also relieve traffic on arterial roads in some cases" (i.e. sharing the load with Toronto Road*). In either case, the ECRTN criteria are LAeq1hr 60dB(A) daytime and LAeq1hr of 55 dB(A) night. The assessment of traffic noise has been based on these definitions in the ECRTN.

2.1.2 Soil

No.	Comment	Response
DoP7	*There is no information regarding the impacts of the stockpiles at the temporary stockpiling areas. These sites will not be included in the approval unless additional information is provided*	The use of temporary stockpiles and licensed storage facilities around the Lake Macquarie Local Government Area (LGA) is in accordance with DECCW requirements for the temporary storage of such materials and does not form part of the EA or proposed development.
DoP8	*Provide additional information about the potential impacts of and potential mitigation measures for onsite stockpiling of capping material*	All capping material will be validated as Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM) or other similar material approved by DECCW prior to importation to the Site. The site will also be securely fenced to prevent unauthorised dumping. During the normal course of filling, there will be very limited temporary storage of material on site prior to placement. Normally material would be brought in over one or two days and be less than 500 tonnes material which would be placed and compacted. However longer term stockpiling of capping material during the construction period may be required, in the event that soil stockpiles are used as part of a geotechnical pre-loading strategy to reduce potential for post-construction differential settlement. The main potential impacts associated with the temporary stockpiling of capping material on the site are considered to be in relation to sediment runoff and dust generation. Mitigation measures for the stockpiling of capping material and other construction activities will be detailed in a Construction Environment Management Plan (CEMP) to be prepared prior to commencement of construction. Proposed mitigations measures for potential sediment runoff and dust generation include: • Implementation of erosion and sediment controls as per Section 11 of the Water Cycle Management Plan in Appendix F of the EA including: - Providing a stabilised access to the site from Weir Road with a facility for removing sediment from truck wheels at the site entrance - Provision of silt fencing around the site perimeter - Provision of silt fences downstream of stockpiles - Provision of temporary sediment basins with water collected to be used for dust suppression on the site and construction water and excess water to be tested, treated if necessary through flocculation or similar and then discharged into the drainage channels adjacent to the site.

No.	Comment	Response
		- Diversion of upstream water around the site - Regular monitoring and maintenance of the sediment and erosion control measures • Implementation of dust control measures including: - Minimising the period and volume of stockpiling where practicable - Where any long term stockpiling is required stabilising the stockpiles with a bitumen emulsion or other suitable material - Use of water sprays on any unstabilised. stockpiles - Visual monitoring to confirm that there is no visible dust at the site boundaries. These mitigations measures will be discussed in more detail in the CEMP.
DoP9	*p19 states 'placement of fill may only occur over clean existing uncontrolled fill'. Please clarify this sentence in light of the preferred remediation strategy*	This statement occurs on p19 of PB (2008) *Geotechnical and Environmental Site Assessment at Lot, 42-43 and 53-54 DP16062, The Weir Road Teralba* which is included as Appendix C of the EA. This statement was inadvertently left in the report, and is inconsistent with other sections of the PB (2008) report as well as with the PB (2008) *Remedial Action Plan* (reproduced in Appendix D of the EA). Existing contaminated fill material is proposed to be left on site and clean imported fill will be placed over the top of the existing fill to cap the contamination, as well as to raise the site to above flood levels.
DoP10	*Further clarification and information is required regarding removal of contaminated fill*	At this stage the remedial strategy is to cap and contain contaminated fill on site and there are no plans to remove contaminated fill from the site.

2.1.3 Water

No.	Comment	Response
DoP11	*So that the results can be verified, provide the data and assumptions used for the Water Cycle Management Plan*	Data and assumptions used for the Water Cycle Management Plan are presented in Appendix D of this report. We would be pleased to provide the actual MUSIC models if requested.
DoP12	*p17 of the Water Cycle Management Plan shows that a catchment area of 3.5ha was used in the MUSIC model. According to the EA the site is 7ha. Why wasn't the whole site included in the model*	The proposed development will comprise: • 4.7ha within the perimeter bund; and • 2.3ha of vegetated bunds and bushland areas that drain to outside the perimeter bund. Of the 4.7ha within the perimeter bund, 1.2ha includes the treatment pond areas and building roofs which do not drain through the water treatment train. The remaining 3.5ha are the remaining areas within the perimeter bund which include all operational, storage, stockpile, road and car parking areas which contribute to the generation of pollutants. All roof areas are accommodated as they flow to tanks and then overflow to the ponds. For the water quality modelling, the 3.5ha (representing the key surface are generating runoff into the water management treatment train) was used in the MUSIC model. Excluding the area of the ponds in the water quality modelling is not significant as the majority of treatment occurs in the sedimentation pond and the bioretention system which have small footprints in relation to the modelled catchment. For the water balance modelling, intended to assess impacts on hydrology and reliability of supply of pond water for site operations, the rain falling directly on the treatment and storage ponds was included in the modelling. This was inadvertently not shown in Figure 8-2 of the EA which should have shown a 1.2ha rainfall contribution on the pond area.
DoP13	*Confirm the capability of the bunds for sewage application. Identify the specific areas proposed for application of sewage*	It has been conservatively estimated that 500L per day of waste water will be generated at the Site which will be treated through a package onsite treatment plant. The *treated effluent* is proposed to be irrigated onto the landscaped bunds around the perimeter of the site through a sprinkler system. The plants proposed for the bunds are considered to be tolerant of the low loads of salts and nutrients they will be exposed to from the treated effluent. The bunds have an approximate area of 5000m^2. Irrigating an average 500L per day onto a 5,000m^2 area is equivalent to a daily irrigation rate of 0.1mm (equivalent to an annual irrigation rate of around 37mm). Irrigation demands could be expected to be in the order of 300mm / year and evaporation a further 1,200mm / year. The bunds are proposed to be constructed with a 3 horizontal:1 vertical slope and will be densely

No.	Comment	Response
		vegetated with ground cover and grass species. Given the densely vegetated nature of the bunds, runoff would not be expected for rainfall or irrigation events under 10mm per day. Since anticipated effluent irrigation is much less than plant demand or evaporation and the irrigation rate will be less than that required to cause runoff on vegetated bunds (i.e. less than 10mm), it is not expected that runoff of irrigated effluent would occur beyond the bunds. In addition, since the bunds will be compacted and vegetated and are well above the groundwater table, the irrigation water would be lost through evapotranspiration and evaporation and would not be expected to impact upon groundwater. In rainy periods the bunds would not be irrigated. Tank storage on site would be provided to cope with an estimated 20 working days of effluent (e.g. approx 10,000L storage tank). As a further contingency in the event the tank was likely to reach its capacity, the effluent could be collected by a licensed wastewater contractor and taken to a licensed wastewater treatment plant.
DoP14	*Was the document "Water Sensitive Urban Design Solutions for Catchments above Wetlands" Hunter and Central Coast Regional Environmental Management Strategy taken in to consideration?*	The document "*Water Sensitive Urban Design Solutions for Catchments above Wetlands*" Hunter and Central Coast Regional Environmental Management Strategy was taken into consideration in developing the water management strategy. Furthermore the principal authors of that document, Dr Peter Breen and Prof Tony Wong, work for AECOM and have both been involved in advising and reviewing the strategy for the proposed Facility.
DoP15	*Undertake a hydrological assessment to determine the current regime of the SEPP14 wetland, EEC and the area containing the Angophora inopina (Angophora inopina is sensitive to changes to the water table and hydrological processes). The assessment should determine the wetland hydrology objectives (please provide hydrologic curves showing minimum and maximum 30 day flow duration curves vs AEP's).*	All runoff from the site flows to an existing drain and is directed to an existing channel downstream. Runoff from the site would no therefore impact the surrounding swamp forest Ecological Endangered Communities (EECs) or *Angophora inopina*. A hydrologic assessment of the impact of site runoff on the EEC (Ball Honeymyrtle Swamp Forest or Swamp Mahogany EECs) that contains the *Angophora inopina* was not considered warranted given the configuration of site drainage. The drainage channel leads to the Freshwater Wetlands EEC (refer to report in Appendix E and as described in the response for Submission 1, Issue 1-2. This Freshwater Wetland EEC has been severely impacted by saline tidal flows and is no longer supported by the catchment freshwater hydrology. AECOM and its subconsultant Ecotone, consider that a hydrologic assessment of the Freshwater Wetland EEC would not further benefit the EEC (also refer to Ecotone letter discussing the impact of the tidal incursions on the Freshwater Wetland EEC in Appendix F).

No.	Comment	Response
DoP16	*Provide details on how CiviLake proposes to maintain the current hydrological regime. Including the same low flow volume, frequency and magnitude of peak flow.*	As discussed above, the low lying portion of the Freshwater Wetland EEC that receives runoff from the site has been severely impacted by saline tidal flows and is no longer supported by the catchment freshwater hydrology. Therefore maintaining the current hydrological regime is no longer considered an important component of maintaining the health of the Freshwater Wetland. The AECOM letter report in Appendix E demonstrates that there are no important ecological communities supported by low flows from the site. Similarly the anticipated residual increase in post development flow volumes is unlikely to influence the health of the Freshwater Wetland as described in the AECOM Letter Report in Appendix E. The anticipated changes in hydrology from the development have been assessed to be within the tolerance limits of the existing Freshwater Wetland EEC. The low lying areas of the Freshwater Wetlands EEC, which the site runoff flows through are a community of marsh-type plant species that are pre-adapted to wet conditions and inundation. This community is naturally flooded or dried out in wetter or drier years and the growth of plants in this community constantly evolves in response to changes in hydrology. Therefore, this community is able to adapt to the additional frequency and duration of inundation. The peak discharge from the developed site will be attenuated using the capacity of the main water storage and the outlet pipe configuration. This will ensure post development peak flows do not exceed the predevelopment peak discharge (for events up to the 1 in 2 year ARI storm event). This is sufficient to protect the downstream channel and Freshwater Wetlands EEC from erosion.
DoP17	*What is the size of the catchment drainage to the wetland?*	The size of the catchment draining to the Freshwater Wetlands EEC is difficult to determine due to the flat nature of the terrain and multiple water bodies in the area. Based on review of available data and AECOM's knowledge of the area, the Site would be expected to comprise less than 20% of the catchment draining to the wetland.

2.1.4 Traffic

No.	Comment	Response
DoP18	*Clarify why there are reduced delays at Griffen Road due to the development traffic?*	As shown in Table 3.1 of the Traffic Assessment, the impacts of development traffic on the surrounding network during the AM peak hour of 2022 is negligible. The 'average delay' calculations in Table 3.1 and Table 5.5 are based on the weighted average of delays per vehicle on all approaches to the intersection. Traffic generated by the proposed development does not contribute to the delay. The analysis shows that the intersection (weighted) delays have reduced as there is no increase in delays, but a slight increase in total traffic travelling past this intersection.
	What is the size of the trucks that will be used to import fill? Are there any specific times proposed for transportation of fill?	The size of trucks that will be used to import fill during the construction period will range between 12 tonne and 32 tonne. The deliveries of this imported fill during the construction period will be Monday to Friday between 7:00am and 6:00pm and on Saturdays between 7:00am and 1:00pm.
DoP19	*Further justification is required as to why the proposed sporting fields weren't considered in the cumulative assessment, particularly Saturday mornings and weekday evenings.*	Council has advised that planning for the use of the North Teralba open space land off Griffen Road has proceeded for a number of years since Council purchased the land. The land was identified for development in the longer term to fulfil the sporting and recreation needs of the growing communities in the north-western sector of the City. However, Council is currently developing sports and recreation facilities in two other areas of the north-western sector; at Cameron Park and Edgeworth. Council has advised that the North Teralba land will not be required for sporting or recreation use for at least the next 10 years. This is supported by its inclusion in Council's *Sports Facility Strategy* (adopted February 2010) which schedules planning to commence in the 10 - 15 year timeframe. No detailed planning has been undertaken on site with respect to site capacity, usage trends, and sporting code use. Until such time as planning for the sports fields are further advanced, Council would not be in a position to determine the impact of traffic generated by the sports field on the current or future road network and any other nearby developments including the proposed Sustainable Resource Centre.
DoP20	*Clarify why the facility would have its peak operations during weekday mornings? Between what times?*	CiviLake has advised that feedstock would in the majority of instances be received and product supplied to road reconstruction works. In order to have traffic back to normal conditions by early afternoon on these road reconstructions, the peak in deliveries would typically be between 8am and 12 noon.

No.	Comment	Response
DoP21	*During which hour were the traffic counts taken?*	Manual traffic counts were undertaken by Australasian Traffic Surveys (ATS) during the AM (7am – 9am) peak period on 30th July 2009 at the following intersections: • Five Islands Road / Toronto Road; • Racecourse Road / Griffen Road; and • Northville Drive / The Weir Road.
DoP22	*Detail contingency measures in case of flooding on the Weir Road?*	The facility will source the majority of feedstock from and supply the majority of product to construction sites. During periods of flooding it is likely the majority of construction sites will be closed and hence the volume of traffic into and out of the facility is likely to be minimal. In any case, vehicles can still access the facility via the Weir Road and Racecourse Road (to the east of the Site), if the Weir Road is closed over the weir. Contingency measures will be detailed in the traffic components of the CEMP and Operational Environmental Management Plan (OEMP).

2.1.5 Flora and Fauna

No.	Comment	Response
DoP23	*Clarify how the bund will be constructed without disturbing the adjacent EEC*	Prior to construction of the bund, a fence will be installed around the EEC and signage will be installed on the fence advising of the presence of the EEC. A silt fence will also be constructed between the proposed bund location and the EEC to prevent sediment runoff into the EEC. These measures will be documented in the CEMP and will be covered in site inductions for construction workers.

2.1.6 Bushfire

No.	Comment	Response
DoP24	*Note: p12-5 AS 3959 was updated in 2009*	Noted. The Bushfire Protection Assessment in Appendix K of the EA has the reference to the correct 2009 standard however the body of the EA text and the SoC was not updated. The revised SoC, attached to this report, has now been updated to reflect the 2009 update.

2.1.7 Statement of Commitments

No.	Comment	Response
DoP25	*The SOC is to be rewritten to read 'will' instead of 'would'*	A revised Statement of Commitments is attached to this report and is written with 'will' instead of 'would'.

2.1.8 Greenhouse Gas / Energy Reduction

No.	Comment	Response
DoP26	*p1804 gives a list of recommendations. Which ones, if any, do CiviLake commit to? Please add to the Statement of Commitments*	CiviLake commits to: • Initially installing a minimum 3kV photovoltaic system on the shed roof and progressively expanding this system to around 15kw total capacity over a 10 year period; • Installing a solar hot water / storage system in the form of roof topped solar panels and a ground or roof mounted tank at the administration building. The system will likely require an electric boost as most systems do in winter.

2.2 Submission 1 (Identity not disclosed)

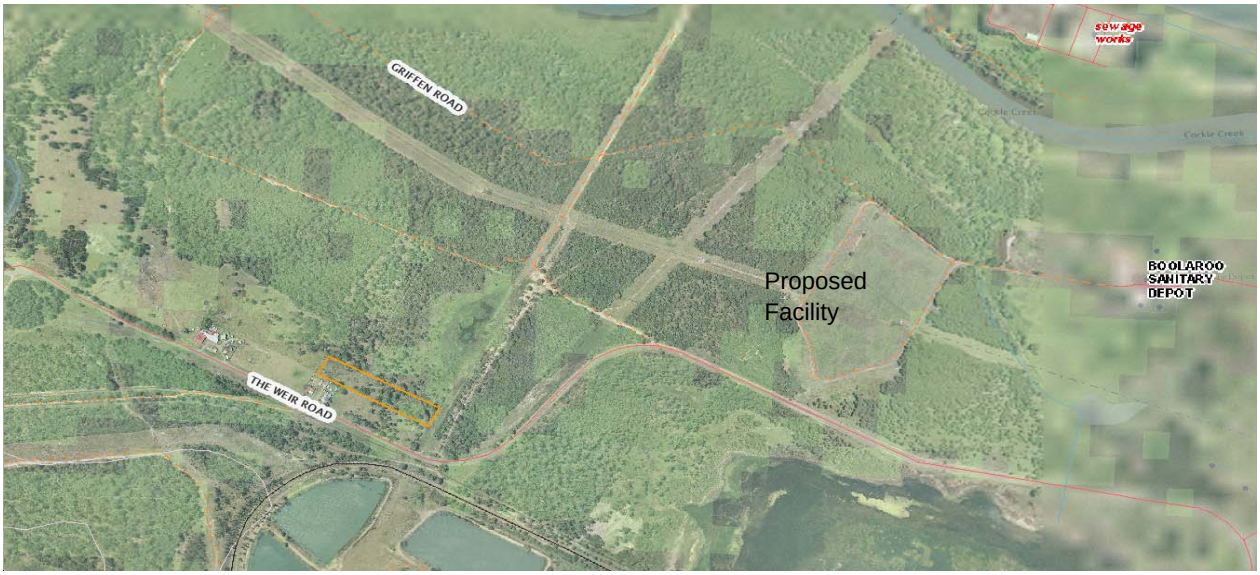
No.	Comment	Response
S1-1	*The proposed site and surrounding area is already recognised by Lake Macquarie city Council as a major flood plain. Any fill, let alone the large amounts of fill proposed for this site will have an obvious impact via an increase in flooding to the lower lying residences and suburbs of this area, such as Barnsley, Edgeworth, Glendale, Boolaroo, and of course Cockle Creek and Teralba. These areas have already experienced major inundation in the last flood of June 2007. Any further filling of this floodplain is totally irresponsible (it is noteworthy that any past attempts by landholders or leaseholders in the area to fill even minor parts of their land has been disallowed by Council).*	Flood levels adjacent to, and downstream of, the development site are generally governed by the tail water level of Lake Macquarie. Any available storage, below the tail water level is obsolete in a major flood event. The analysis contained within Section 9 of the report '*Lake Macquarie Council (2009) Analysis On The Impact Of Flooding In Cockle Creek For Proposed Construction Waste Recycling Facility The Weir Road, Teralba'* (Appendix G of the EA), demonstrates the insignificance of filling the development site, with an estimated rise of only 0.01m occurring on area that is flood affected
S1-2	*My other main concern is the natural wetlands that surround this proposed site. Any overflow, or even rainfall runoff, no matter how small; will enter the adjacent wetland which in turn flows directly into Cockle Creek and then into the northern end of Lake Macquarie. Any silt or contaminants on this site have the potential to either leach through the soil into the water table or run directly into the wetland system. This is a large breeding area for fish and other native animals and is especially important to the birdlife that survives on its ecosystem. Some of this wetland area would be the only natural fresh water swamplands for a great distance*.	The drainage pathway for runoff from the site is described in detail in the AECOM report "*Sustainable Resource Centre, Teralba - Assessment of Hydrological Impacts of Development on Receiving Environments*" a copy of which is reproduced in Appendix E. Runoff discharged from the site flows through existing surface drainage, to low lying areas of a Freshwater Wetlands EEC north of Weir Road (part of the SEPP14 wetlands), then through a drainage channel and culvert to a lake (south of Weir Road), and finally through an additional culvert to Cockle Creek, and eventually Lake Macquarie. The submission refers to a "wetland directly connected to Cockle Creek". This system is referred to below as the lake (south of Weir Road). Runoff does not flow to the surrounding swamp forest nor to the portion of the SEPP 14 Freshwater Wetland to the south of the Weir Road. Therefore potential impacts of runoff from the proposed development are limited to the drainage channel, the low lying areas of SEPP14 Wetlands (Freshwater Wetland EEC) to the

No.	Comment	Response
		north of the Weir Road, the lake, Cockle Creek, and Lake Macquarie. Potential impacts can be a) water quality or b) hydrological (related to the volume of flow) each of which are discussed below: a) Water Quality – The sediment loads expected to be generated by this site have been simulated in a computer modelling assessment of water quality treatment. For the purposes of modelling, sediment loads were conservatively assumed to be an order of magnitude higher than those generated by urban areas. Proposed treatment systems include swales, a sedimentation basin, a bioretention system, and a pond. These treatment systems remove sediment, sediment bound pollutants and dissolved pollutants. Additionally, as described in the WCMP pollutant loads are further reduced as most water is reused on site and only excess water is released downstream. Modelling has indicated the proposed treatment system will treat runoff to a standard equivalent to best practice required for runoff from urban development which has been assessed in the WCMP to be within the tolerance limits of the wetland communities and aquatic ecosystems of the lake. b) Hydrological Impacts – The *Water Cycle Management Plan* (WCMP) in the EA conservatively recommended that measures be put in place to reduce changes to pre-development hydrology. Subsequently a more detailed assessment of the Freshwater Wetland EEC and its potential to be impacted by changes in hydrology has been conducted by an AECOM wetland ecology specialist. This assessment has indicated that the low lying portion of the Freshwater Wetland EECs which receives runoff from the site and the lake, previously reported as freshwater, are a community of marsh-type plant species that are pre-adapted to wet conditions and inundation. This community is naturally flooded or dried out in wetter or drier years and the growth of plants in this community constantly evolves in response to changes in hydrology. Therefore, this community is able to adapt to the increase in frequency and duration of flooding. Additionally, the low lying areas are currently tidal and brackish due to hydraulic connection to Cockle Creek. The potential impact of an increase in freshwater from the site resulting from increased post development runoff is much less than the impact of saline tidal inundation and may actually provide some relief to the existing vegetation from the saline conditions (refer to the AECOM letter report entitled '*Sustainable Resource Centre, Teralba – An Assessment of the Hydrological Impacts of Site Development on*

No.	Comment	Response
		the Receiving Environments' in Appendix E and Ecotone letter in Appendix F). A 2-3m layer of compacted fill will be placed on the site which would be expected to reduce infiltration to subsurface soils and groundwater. Furthermore, as described in the EA, the materials to be stored and processed on the site are not expected to contain significant chemical contaminants and hence there is low potential for significant leaching of contaminants into groundwater.

2.3 Submission 2 (from Owner of 158 the Weir Road Teralba)

Lot 3 DP 32484 (158 Weir Road) is shown in the image below (yellow box) along with its relationship to the proposed facility. The property does not currently contain a dwelling house.



No.	Comment	Response
S2-1	*Increase in the amount of trucks using the Weir Road. There are already a substantial number of heavy trucks using this road and the increase in truck usage proposed would be a huge problem.*	Based on the 2009 traffic surveys, there are currently 15 heavy vehicles using the Weir Road (to the west of the proposed facility) during the AM peak hour. The number of trucks at this location is estimated to increase to 18 during the AM peak hour in 2022 assuming a background growth rate of 0.9% p.a. to account for traffic growth in the vicinity of the proposed development. The proposed development will generate additional trucks on the Weir Road (to the west of the proposed facility). Based on the expected trip generation and distribution, the number of trucks at this location including background plus development will increase to approximately 25 during the AM peak hour in 2022. On this basis the increase in trucks using the Weir Road is not considered to be significant to the Weir Road.

No.	Comment	Response
S2-2	*The weir crossing between the proposed site and the Barnsley Public School is already dangerous and at times unsuitable for traffic to cross and the increase in usage would again be a substantial problem*	Based on the 2009 traffic surveys, there are approximately 180 vehicles using the Weir Road (near Barnsley Public School) during the AM peak hour. It is expected that total traffic at this location will increase to approximately 205 vehicles per hour during the AM peak hour in 2022 assuming a background growth rate of 0.9% p.a. The proposed development will generate an additional 13 trips (light and heavy vehicles) during the AM peak hour to the Weir Road, to the west of the proposed development. Therefore, the contribution of development traffic at the weir crossing and Barnsley Public School is approximately 6% of the total expected traffic flow at this location during the AM peak hour. This is well below the expected 10% daily variation of traffic volume expected on any road network and hence the impacts of the development on traffic at these locations are considered negligible.
S2-3	*Concern over the amount of noise this project would create for nearby residents* *Concern over the noise during night hours that will be created by machinery operating with loading and unloading trucks*	The subject property is in excess of 600 meters from the facility at its closest point of approach. The acoustic report assessed the immediately adjacent residence at Lot 1 DP 325866, 180 Weir Road, and found that the worst case noise emissions from the proposed recycling facility comply with the requirements of the Industrial Noise Policy. Lot 3 does not currently contain a dwelling however it is zoned for rural living and the submission indicated an application for a new dwelling would be made to Council in the near future. At the time of writing this submissions report a development application had not yet been made to Council. Under the NSW Industrial Noise Policy, a noise assessment is required to be conducted to a point within 30m of a dwelling. As it is not currently known where on the lot the dwelling is proposed (and the lot is some 200m long) such an assessment cannot be made at this stage. However, the noise contours in the *Acoustic Assessment* in Appendix O of the EA show that the noise levels at the eastern boundary of Lot 3, which is closest to the proposed development, comply with the requirements of the Industrial Noise Policy under worst case noise emission conditions for both day time and night time operations. A review of the contours demonstrates that noise control treatments for the mulching machine and crusher have been primarily designed to be effective for noise emissions to dwellings to the north-west of the site. Should it prove necessary to reduce noise levels at lots to the south-west of the site then noise control treatments can be readily modified as part of the site management plan to further reduce noise levels at Lot 3. The subject property is in excess of 50 metres from the Weir Road and would not be adversely affected by the minor increase in truck volume associated with the proposed development.

No.	Comment	Response
S2-4	*Concern over the dust this project will create for houses that are south-west of the proposed site*	As outlined in Section 6.1.3 of the Air Quality Impact Assessment (Appendix N of the EA), the greatest level of deposited dust predicted by the dispersion modelling at a sensitive receptor was 0.1 g/m2.month, which is well below the impact assessment criteria that allow a maximum increase of 2 g/m^2.month over existing dust levels, or a maximum total dust deposition level of 4 g/m^2.month at any location. The levels of deposited dust predicted at the residential properties to the south-west of the site were even lower. These levels of dust are not expected to be distinguishable from background concentrations and, as such, no dust impacts are expected to occur for any sensitive receptors, including those located southwest of the proposed site. Furthermore, winds in the area do not typically blow towards the southwest of the facility,
S2-5	*Concern over the odour this project will create for houses that are south-west of the proposed site*	As outlined in Section 2.2.4 of the *Air Quality Impact Assessment* (AQIA) (Appendix N of the EA), the only green waste that would be received at the site would be dry green waste, which would be stockpiled for sale with short turnaround times anticipated. No composting of green waste would occur. No grass clippings or putrescible wastes would be received at the site. As further described in Section 3.2.2 of the AQIA, the storage and processing of green waste has a much lower risk of generating offensive odours compared to operations that compost biosolids, manure or food waste. The facility is intended to receive materials that are unlikely to cause offensive odour emissions. The AQIA assessed odour emissions from the green waste stockpile, the bioretention system that receives leachate from the green waste stockpile, and the product bins storing the blended soil/green waste mixtures. The highest off-site odour concentration predicted by the dispersion modelling was 0.28 Odour Units (OU), which is well below the assessment criterion of 2 OU, and also well below the detectable odour concentration of 1 OU. As such, the facility is not expected to generate odours that will affect any sensitive receptors, including those located to the southwest of the proposed facility. Furthermore, winds in the area do not typically blow towards the southwest of the facility.

2.4 Submission 3 (from Owner of 190 the Weir Road Teralba)

Lot 1 DP23484 (190 Weir Road) is shown in the image below (yellow box) along with its relationship to the proposed facility.

No.	Comment	Response
S3-1	*Noise levels will increase*	The subject property is in excess of 800 meters from the facility at its closest point of approach. The acoustic report assessed the immediately adjacent residence at Lot 1 DP 325866, 180 Weir Road, and found that the worst case noise emissions from the proposed recycling facility comply with the requirements of the Industrial Noise Policy. Lot 1 DP23484 does not currently contain a dwelling however it is zoned for rural living. At the time of writing this submissions report no development application had been made to Council for a dwelling on the property. Under the NSW INP a noise assessment is required to be conducted to a point within 30m of a dwelling. As it is not currently known where on the lot the dwelling is proposed such an assessment cannot be made at this stage. However, the noise contours in the *Acoustic Assessment* in Appendix O of the EA show that the noise levels at the eastern boundary of Lot 1, which is closest to the proposed development, comply with the requirements of the Industrial Noise Policy under worst case noise emission conditions for both day time and night time operations. The subject property is in excess of 50 metres from the Weir Road and would not be adversely affected by the minor increase in truck volume associated with the proposed development.

No.	Comment	Response
S3-2	*The odour that will be produced*	As outlined in Section 2.2.4 of the AQIA (Appendix N of the EA), the only green waste that would be received at the site would be dry green waste, which would be stockpiled for sale with short turnaround times anticipated. No composting of green waste would occur. No grass clippings or putrescible wastes would be received at the site. As further described in Section 3.2.2, the storage (for a limited period) and processing of green waste has a much lower risk of generating offensive odours compared to operations that compost biosolids, manure or food waste. The facility is intended to receive materials that are unlikely to cause offensive odour emissions. The AQIA assessed odour emissions from the green waste stockpile, the bioretention system that receives leachate from the green waste stockpile, and the product bins storing the blended soil/green waste mixtures. The highest off-site odour concentration predicted by the dispersion modelling was 0.28 OU, which is well below the assessment criterion of 2 OU, and also well below the detectable odour concentration of 1 OU. As such, the facility is not expected to generate odours that will affect any sensitive receptors, including those located to the southwest of the proposed facility. Furthermore, winds in the area do not typically blow towards the southwest of the facility.
S3-3	*the amount of dust that will be produced*	As outlined in Section 6.1.3 of the Air Quality Impact Assessment (Appendix N of the EA), the greatest level of deposited dust predicted by the dispersion modelling at a sensitive receptor was 0.1 g/m2.month, which is well below the impact assessment criteria that allow a maximum increase of 2 g/m^2.month over existing dust levels, or a maximum total dust deposition level of 4 g/m^2.month at any location. The levels of deposited dust predicted at the residential properties to the south-west of the site were even lower. These levels of dust are not expected to be distinguishable from background concentrations and, as such, no dust impacts are expected to occur for any sensitive receptors, including those located southwest of the proposed site. Furthermore, winds in the area do not typically blow towards the southwest of the facility, which makes it even less likely for impacts to affect residents located in this direction.

No.	Comment	Response
S3-4	*the increase in traffic, particularly trucks over the Weir Road*	Based on the 2009 traffic surveys, there are 15 heavy vehicles using the Weir Road (to the west of the proposed facility) during the AM peak hour. The number of trucks at this location will increase to approximately 20 during the AM peak hour in 2022 assuming a background growth rate of 0.9% p.a. to account for traffic growth in the vicinity of the proposed development. The proposed development will generate additional trucks on the Weir Road (to the west of the proposed facility). Based on the expected trip generation and distribution, the number of trucks at this location will increase to approximately 25 during the AM peak hour in 2022. On this basis the increase in trucks using the Weir Road is not considered to be significant to the Weir Road. Similarly the percentage increase of other vehicles due to the development is considered to be negligible.

2.5 Submission 4 (Concrush)

No.	Comment	Response
	Lack Of Jurisdiction To Approve	
S4-1	*EA lodged greater than 2 years after DGRs were issued*	This issue to be responded to by DoP.
	Environmental Assessment	
	Flooding Issues	
S4-2.1	*The flood study forming part of the EA did not contain Appendices E – HEC-RAS Output Data 100 year ARI Event with Climate Change Considered and F – Impact of Loss of Flood Storage. The Objector is unable to consider properly the adequacy of the flood study in the circumstances that Appendices A and F have not been part of the exhibition of the proposal.*	Appendix E and F of the Flood Report entitled '*Lake Macquarie Council (2009) Analysis On The Impact Of Flooding In Cockle Creek For Proposed Construction Waste Recycling Facility The Weir Road, Teralba'* (Appendix G of the EA) were inadvertently left out of the exhibition version of the Environmental Assessment. A copy of Appendix E and F of the Flood Report has been included as Appendix G of this report.
S4-2.5.1	*The Flood Report relies at Section 6 on flow data derived from a 1986 study. The flows adopted do not take into account the affects of the development within the contributing catchment over the past 24 years. The effects of such development over the period are likely to have resulted in an increase in peak water flow. The flood report does not address this likely increase either by way of its nature or impacts on the development sites and surrounding lands*	*Lake Macquarie Council (2009) Analysis On The Impact Of Flooding In Cockle Creek For Proposed Construction Waste Recycling Facility The Weir Road, Teralba'* has utilised flows derived from a previous study undertaken in 1986. Since the early 1980s and prior to the 1986 study up to now, Council consistently applied a stormwater detention policy through the LGA. On that basis, the peak flows in question remain substantially unchanged since the original study. In addition, in the intervening period, Hunter Water Corporation has constructed major detention basins at both Hillsborough Road and Cardiff South, both of which assist in attenuating flows which eventually flow into Cockle Creek. The sensitivity analysis undertaken in Section 8 of the report, demonstrates that the differences between pre developed and post developed flood levels is independent of flow rate in major events.

No.	Comment	Response
S4-2.5.2	*The Flood Report uses a HEC-RASA model to investigate the impacts of the proposed filling of the site. This model is simply a one0dimensional flood model and is unlikely to adequately consider flood storage or hydraulic processes within the flood plains (i.e. the development site). It is likely that the adoption of this model could result in gross underestimation of the flood impacts resulting from the filling of the site.*	It is acknowledged that HECRAS is a one dimensional flood model. However, in this case it is considered that its use is appropriate, given that the vast majority of flood storage within the vicinity of the development site is inundated by backwater from the lake. The volumetric analysis contained within Section 9 of the report, demonstrates the insignificance of filling for the development site, with an estimated rise of 0.01m occurring in the area that is flood effected.
S4-2.5.3	*The Flood Report adopts as its premise only a simple volumetric analysis of the impact of filing of flood liable lands (the development site). The Flood Report does not undertake any accurate assessment of the impacts of the filling of flood liable land comprised in the site. This analysis is extremely rudimentary and is likely to be inadequate given the complex hydraulic process occurring within the floodplain*	Flood levels adjacent to, and downstream of the development site are generally governed by the tail water level of the lake. Any available storage, below such levels is obsolete in a major event. The first principles type approach adopted in Section 9 of the report is considered adequate given that lake level governs the flooding regime.
S4-2.5.4	*The Flood Report does not contain Appendix F which, as referenced by Section 9 of the Flood Report, contains calculation of that volumetric analysis. A detail and reasonable assessment of that volumetric analysis accordingly is unable to be carried out.*	Appendix F of the Flood Report was inadvertently left out of the exhibition version of the EA. A copy of Appendix F of the Flood Report has been attached as Appendix G of this report.
S4-2.5.5	*The Flood Report Fails to provide an assessment of the potential of floodwaters to scour and destabilise the proposed fill batters.*	The development site is located in excess of 200m from the main channel of Cockle Creek where appreciable velocities may be expected to occur. Velocities in the area of the site will be low as the site sits in a flat and unconfined floodplain. Due to the nature of the topography, floodwaters around the site are unlikely to reach the velocity required to cause scour. Furthermore, the proposed fill batters will be protected against scour by densely planted vegetation.
	Importation of Fill	
S4-2.2	*The proposal set out in the EA involves the raising of the natural ground level by between 2 and 3m by the importing and depositing of approximately 200,000tonnes of fill. Such is a major part of the proposal. The EA does not deal with the impacts of such fill*	The impacts of raising of the site were considered in relation to all relevant environmental factors including the visual impact assessment, acoustic assessment, contamination and geotechnical assessment, air quality impact assessment, flood assessment, water cycle management plan, assessment of the electrical transmission easement and so on. The impacts of the process of filling were also considered in relevant assessments including the traffic assessment, contamination and geotechnical assessment, acoustic assessment, contamination and geotechnical assessment, air quality impact assessment, water cycle management plan with mitigations discussed. Detailed mitigation measures for the importation and placement of fill will be provided in the CEMP.

No.	Comment	Response
	Extractive Industries	
S4-2.3	*The proposed development is an extractive industry within the meaning of that expression as contained in Schedule One ("Extractive Industry Related Works")and:* • *That part of the proposal as relates to the filling of the land falls within the definition of "extractive industry" as contained in Schedule One Part 3A SEPP (Major Developments) 2005.* • *The "extractive industry related works" is ancillary to the Part 3A project comprised in the application* • *The provisions of s75B(3) of the EPA Act Apply to the "extractive industry related works" and are to the addressed by the EA* • *The EA does not identify, characterise or particularise the impacts of the "extractive industry related works".*	The proposed development falls under "Group 9 Resource and Waste Related Industries" and specifically under "27 Resource recovery or waste facilities" in Schedule 1 Part 3A State Environmental Planning Policy (SEPP) (Major Developments) 2005. The proposed development does not fall under the definition of "an extractive industry" in Group 2 (Number 7) of the SEPP as the proposal is not: • Development for the purpose of extractive industry that (a) extracts more than 200,000 tonnes of extractive materials per year, or (b) extracts from a total resource (the subject of the development application (or other relevant application under the Act)) of more than 5 million tonnes; or • Development for the purpose of extractive industry related works (including processing plants, water management systems, or facilities for storage, loading or transporting any construction material or waste material). The proposed Facility is a resource recovery Facility and although comprises components of storage, this is not for storage related to extractive industries and has been designed to enable stored material to be resumed / recycled / reused.
	Traffic	
S4-2.4.1	*The Traffic Assessment Report fails to assess adequately the impact of the proposed development on Five Islands road a State road classification MR217 as a major arterial route along the west coast of Lake Macquarie*	The Traffic Assessment has assessed the impacts of the proposed development on the intersection of Five Islands Road and Toronto Road and demonstrated that the impacts is negligible to this intersection, It has been assessed that in 2022 development traffic would contribute 19 vehicle movements or less than 1% of the total vehicle movements on Five Islands Road during the AM peak hour. It is therefore considered that the contribution of development traffic to Five Island Road is minimal compared to existing and future traffic volumes on Five Islands Road.
S4-2.4.2	*The Traffic Assessment Report provides no assessment of the existing traffic conditions within the villages of Teralba and Barnsley and no assessment of the impacts of traffic generated by the proposed development on those conditions. In particular there is no assessment of the use of the proposed haulage routes at school tomes and the impact of traffic generated by the development on school frontages and school bus routes, pedestrian cluster points and the impact of additional traffic on the local amenity of the villages of Teralba and Barnsley*	The Traffic Assessment has assessed the impacts of the proposed development on the intersection of The Weir Road and Northville Drive in the vicinity of Barnsley Primary School and the village of Barnsley during the AM peak hour which coincides with the school peak hour. The assessment has demonstrated that the impacts are negligible to Barnsley Primary School and the village of Barnsley. The Traffic Assessment has also assessed the impacts of the proposed development on the intersection of Five Islands Road and York Street in the vicinity of the village of Teralba during the AM peak hour which coincides with the school peak hour. The assessment has demonstrated that the impacts are negligible to the village of Teralba,

No.	Comment	Response
		The afternoon school peak hour has not been assessed as: • the morning peak is considered to have the highest background traffic conditions on the road network; and • the expected truck generation after 12 noon is expected to be minimal and therefore has no significant impacts to the surrounding land uses.
S4-2.4.3	*The Traffic Assessment Report fails to provide an assessment of the impact of traffic generated by the facility on sporting / recreational facilities in the area given that Tables 4.1 and 4.2 of the Report state that the facility will operate 6 days per week*	The haulage route is expected to travel past some of the sports/recreational facilities along Racecourse Road, York Street and Toronto Road. The additional traffic movements generated by the proposed development will not significantly contribute to traffic delays in the vicinity of these facilities.
S4-2.4.4	*The Traffic Assessment Report fails to assess pm peak traffic impacts having regard to school peak traffic and trade peak traffic in the pm period. Inconsistently the report suggests that the facility will have inwards traffic up to 4pm whilst outwards traffic will cease at 3pm*	The afternoon school and trade peak hour has not been assessed as: • the morning peak is considered to have the highest background traffic conditions on the road network (and includes the morning school peak traffic); and • the expected truck generation after 12 noon is expected to be lower than prior to 12 noon and therefore has no significant impacts to the surrounding land use. With regards to inwards and outwards traffic, the report states that: • The transportation of materials out of the Facility will typically take place up to 3pm • The delivery of feedstock into the Facility will typically take place up to 4pm. The above two statements are not inconsistent with each other. The difference in times for cessation of deliveries into and out of the facility is attributable to the travel time between the Facility and destination / source sites. Material transported out of the Facility needs to leave the Facility in time to arrive at its destination and be unloaded before the destination site closes. However, material destined for the Facility can leave a source site up to the time that site closes.
S4-2.4.5	*The Traffic Assessment Report fails to identify whether the general public will have access to the facility and if so at what times, and to provide an assessment of the impact of such access on traffic*	It is not proposed to allow the general public to access the facility.
S4-2.4.6	*The Traffic Assessment Report fails to assess the impact on existing vulnerable road users along the haulage route within a reasonable area of influence of the proposed site*	As demonstrated in the Traffic Assessment, the volume of development traffic is negligible in comparison to existing traffic along the haulage route. Therefore the additional development traffic will not significantly change the environment for pedestrians, cyclists and other road users along the haulage route.

No.	Comment	Response
S4-2.4.7	*The Traffic Assessment Report fails to identify all potential traffic generators and impacts*	The traffic assessment covers all existing traffic generators. CiviLake, following consultation with Lake Macquarie City Council, advised at the time of preparation of the traffic assessment that there were no other major developments currently proposed in the vicinity of the site apart from the sporting facilities where the anticipated time for development is set greater than 10 years into the future.
	Concept Design	
S4-2.6	*The Concept Design Drawing Package exhibited as Appendix B ("Concept Design") to the EA fails to provide an assessment in terms of potential geotechnical impacts of the placing of a large amount of fill over the flood plain*	The concept drawing package is provided to enable a visual representation of the proposed Facility. Geotechnical impacts are discussed in Section 6 and Appendix C of the EA.
	Water Cycle Management Plan	
S4-2.7.1	*The Water Cycle Management Plan does not include enough technical foundation and justification (i.e. input parameters and output results) to enable a reasonable assessment of water quality determination (i.e. [peak flow, volumetric calculations etc) or water quality treatments (i.e. MUSIC, source generation parameters, treatment train design parameters etc)*	As requested by the DoP, parameters used for modelling are included as Appendix D of this report
S4-2.7.2	*The Water Cycle Management Plan does not consider the effect which the proposed filling of the Development site will have an overland flow to and from neighbouring properties*	Overland flow towards the site will not be altered as the site sits in a wide unconfined floodplain and existing drainage ditches along the northern, western and eastern perimeters direct flows from the external catchments around the site. Such flows will not be altered as the northern and eastern drainage ditches will be retained while new drainage elements will be incorporated along the western boundary to replace the existing drain that will be filled over by the bund. Flows from the site are contained in drainage ditches that discharge to an existing channel.
	Planning Issues	
S4-3.1	*The project is permissible development as "waste management and /or recycling facility" within the subject land which is zoned 9 Natural Resources pursuant to Lake* Macquarie Council LEP 2004. • *The project is not consistent with the relevant objectives as set out in the table to clause 15 of the LEP 2004 for Zone 9 Natural Resources* • *Clause 16 of the LEP 2004 provides that consent must not be granted for such development unless the consent authority is satisfied that the proposed development is consistent with those zone objectives* • *Accordingly pursuant to the*	Zone 9 Natural Resources allows development for the purposes of waste management and/or recycling facilities. It is also considered that the project is consistent with the relevant objectives as set out in the table to Clause 15 of the LEP 2004 for Zone 9 Natural Resource as: • The project recognises the dual values of the land and integrates economic use of the land with ecological sustainability – specifically the site would: - protect natural resources by providing sustainable recycled materials for use within the public and private construction sectors; - provide an improvement to the operating environmental performance of CiviLake's existing operations; - provide additional employment prospects and subsequent economic benefits to the local

No.	Comment	Response
	provisions of clause 8O of the Environmental Planning and Assessment Regulation (2000) the minister is preclude form granting approval for the carrying out of the project under Part 3A of the EPA Act.	economy; - Rehabilitate a site contaminated from former use as a night soil depot and from past placement of contaminated fill; - Provide for sustainable water cycle and energy management. • The project acknowledges the long term value of the land for the management and maintenance of biodiversity and threatened species by minimising the adverse impacts of resource development – specifically the project has been designed to develop disturbed parts of the Site and to avoid areas where EEC are present. As discussed a small number of *Angophora inopina* trees are proposed to be removed, however an appropriate offset has been proposed in the form of planting of new trees to ensure a net benefit to the environment. This is discussed further in Section 3 of this report. • Rehabilitate disturbed land to a natural state, reflective of its long term value – The site was previously used as a night soil depot and is contaminated as a result of the night soil depot activities as well as past filling of the site with contaminated fill. The site will be remediated as part of the site development. • Minimise earthworks while enabling productive use of the land – Given the contaminated state of the land, extensive earthworks would either be required to remove the contaminated fill or to cap the contaminated fill. In addition any development on the land would require the site level to be raised through filling to protect against flood water entering the site. Earthworks are proposed to remediate the site (by capping), to raise the site above flood levels and to facilitate appropriate water management. • Provide for sustainable water cycle management – A sustainable water cycle management strategy has been developed for the site as described in the Water Cycle Management Plan in the EA. This strategy includes: - Providing sufficient water storage on site to provide a sustainable and reliable water supply for the water demands of the facility such as for dust suppression and the mill/crushing plant; - Reducing the demand on potable town water supplies through a range of initiatives such as reuse of water from the storage ponds and collect of water from rooves in tanks for reuse; - Removing stormwater pollutants from runoff to mitigate potential impacts on the downstream receiving environment; - Ensuring peak discharge from the developed site does not exceed the predevelopment peak discharge (for events up to the 1 in 2 year Average Recurrence Interval (ARI) storm event)

No.	Comment	Response
		in order to mitigate the risk of erosion towards the receiving environment and the Freshwater Wetland EEC.
S4-3.2	*The site of the development is flood prone land within the meaning of LEP 2004. In this respect:* • *Clause 32 of LEP 2004 provides that before granting consent for the development on flood prone land the consent authority must inter alia be satisfied that to carry out the development in accordance with the posed consent would be consistent with flood hazard and levels of risk that are acceptable to the community* • *In the light of the inadequacies of the EA the minister could not be satisfied that to carry out the development would be consistent with the flood hazard and levels of risk that are acceptable to the community within the meaning of Clause 32 of LEP 2004* *Accordingly pursuant to the provisions of Clause 8O of the EPA Regulation 200 the minster is precluded from granting approval of the carrying out of the project under Part 3A of the EPA Act.*	Flood levels adjacent to, and downstream of the development site are generally governed by the tail water level of Lake Macquarie. Any available storage, below such levels is obsolete in a major flood event. The report Lake Macquarie City Council *(2009) 'Analysis On The Impact Of Flooding In Cockle Creek For Proposed Construction Waste Recycling Facility The Weir Road, Teralba'* (Appendix G of the EA), demonstrates the insignificance of filling the development site, with an estimated rise of only 0.01m occurring in area that is flood effected.
	Engineering Issues	
S4-4.1	*Consolidation processes due to site filling are likely to result in differential settlement of the development site once filled. Such differential surface settlement will affect the integrity of development structures and services as well as the potential to impound and significantly alter ground water movement*	Recommendations in relation to differential settlement from filling of the site are provided in the PB Geotechnical Report in Appendix C of the EA. Detailed design of the earthworks, services and structure foundations for the Facility will take into account the potential for differential settlement. With respect to groundwater, the site has previously been extensively filled and the additional filling would not be expected to significantly further alter groundwater movement.
S4-4.2	*The placement of substantial quantities of fill is likely to impound overland flow of water resulting in changes in the surface and subsurface hydraulics*	The site sits in a wide unconfined floodplain and existing drainage ditches along the northern, western and eastern perimeters directs flows from the external catchments around the site. Such flows will not be altered as the northern and eastern drainage ditches will be retained while a new drainage elements will be incorporated along the western boundary to replace the existing drain that will be filled over by the bund. Stormwater on site will be managed through a treatment train as described in the WCMP. Flows from the site will be contained in an existing drainage channel downstream.

No.	Comment	Response
S4-4.3	*Peak water velocities in times of flood will have potential to erode earth fill embankment, cause downstream environmental erosion and deposition and destabilise site structures*	The development site is located in excess of 200m from the main channel of Cockle Creek. Velocities in this area will be low. Vegetated batters will provide adequate protection against scouring. Site structures will be designed to be supported by suitable foundations and will not be destabilised by any flooding.
S4-4.4	*It is likely that importing of fill during earthworks operations will necessitate as many as 10,000 truck movements to and from the development site. These movements will generate massive traffic and acoustic impacts on five Islands road and the villages of Barnsley and Teralba*	The filling of the site is proposed to occur over a two to three year period. Assuming a worst case scenario of importing 100,000 tonne of fill per year using average 20 tonne trucks and 300 working days, the construction stage will generate 17 heavy vehicle trips (34 truck movements) per day. Given that the heavy vehicle generation during the construction stage is much less than the operation stage and the surrounding road network will operate with an acceptable level of service and noise during the operation stage, the impacts during the construction stage are considered to be negligible.
	Traffic Issues	
S5	*The EA Traffic Assessment Report Exhibit J focuses solely on road capacity. It omits any analysis of their impact of the proposed development on the safety of vulnerable road users identified in paragraph 2.4 above.*	The volume of development traffic is negligible in comparison to existing traffic along the haulage route, therefore the additional development traffic will not significantly change the environment for pedestrians, cyclists and other road users along the haulage route.

2.6 DECCW Conditions of Approval

No.	Condition of Approval	Comment / Request for Amendment
1	*The Proponent will develop and implement and Environmental Management Plan prior to construction commencing at the Premises*	For clarity and to be consistent with the terminology used in the EA and SoC, AECOM request that this plan be referred to as a 'Construction Environmental Management Plan'
4	*The Proponent shall ensure that the dirty water dam(s) at the Premises* *a) Are capable of accepting dirty water generated in a 1 in 2 year, 24 hour duration storm event without overflowing.*	The Water Cycle Management Plan committed to ensure post development peak flows do not exceed the predevelopment peak discharge (for events up to the 1 in 2 year ARI storm event) to mitigate the risk of erosion along the flow paths of the receiving environment. There was no other mention of the 1 in 2 year event in the EA. The water treatment train has been designed as a whole to adequately address pollutant loads across a range of storms but is not intended to retain specific events in the dirty water pond. A detailed explanation of the treatment strategy is discussed in the Water Cycle Management Plan in the EA On this basis, AECOM request that this condition be removed.

No.	Condition of Approval	Comment / Request for Amendment
6b	*The Proponent shall ensure that only one of the volume of waste is used to raise the height of the Premises, whichever is lesser:* • *200,000 tonne* • *Raised to a level to prevent a 1 in 100 year rain event flooding the premises*	In relation to the first bullet point , 200,000 tonnes referred to in the EA is an estimate of imported fill volume only. The actual fill volume could be higher or lower than this amount. The maximum fill volume required will only be known after detailed design. In relation to the second bullet point, the bund around the site is proposed to be raised to a minimum level of 3.4 AHD which accommodates the 1 in 100 year ARI flood level (including allowance for climate change) with a 0.5m freeboard. However the earthworks design for the site is also based on achieving appropriate water management on the site which requires additional filling above the flood level. On the above basis, it is requested this condition be modified to read: *The Proponent shall ensure that the volume of waste used to raise the height of the Premises does not exceed 240,000 tonne (200,000 tonne estimated in EA plus 20% contingency) without approval from DECCW and does not exceed the amount of fill required to:* • *Raise the site to a level to prevent a 1 in 100 year rain event flooding the premises (including an appropriate freeboard); and* • *Achieve an earthworks profile that facilitates appropriate water management on the site.*
7c	*The proponent must install a perimeter bund which avoids the trees species depicted in Figure 1titled 'Proposed Site Layout – Environmental Assessment'*	As discussed in Section 3 it has been assessed that retention of the Angophora *inopina* trees along the western boundary on site is not practicable and it is instead proposed to provide an offset through replanting of Angophora *inopina* trees at a nearby location at a suitable ration. On this basis AECOM request this condition be deleted and replaced with other suitable conditions based on the revised Statement of Commitments.
8a	*The proponent shall not receive any waste that is not ENM, VENM, soil, concrete, asphalt, road diggings, bricks, tiles, timber waste or green waste*	CiviLake request that this list be extended to include: *'Other waste covered by DECCW exemptions for construction material recycling as may be approved from time to time'*
11	*The Proponent must store all waste:* *a) Which is combustible 20m or more away from identified bushfire prone vegetation* **b)** *Outside transmission easement zones*	AECOM request that this condition be modified as follows to reflect the commitments in the EA: '*The Proponent must store all waste which is combustible:* *a) 20m or more away from identified bushfire prone vegetation* *b) Outside transmission easement zones'* As specified in the EA, non combustible waste is proposed to be stored in the transmission easements with height restrictions and operating procedures as per EnergyAustralia requirements.

No.	Condition of Approval	Comment / Request for Amendment
13	*Reference to Sound Barrier Walls*	No sound barrier walls are proposed to be constructed. Rather 'sound attenuation barriers' are proposed to be constructed around the crusher and tub grinder as per the SoC and the Noise Assessment Report recommendations. At this stage the sound attenuation barriers are likely to be noise mounds constructed of soil or other stockpiled material. The design and location of the barriers would be at the direction of a suitably qualified acoustics consultant and be coordinated with the operational requirements of the proposed Facility. We request that this condition be modified to reflect '*Sound Attenuation Barriers'* rather than 'Sound Barrier Walls'.
15	**Operating Hours** *** Max. 50 out of hours deliveries per year*	AECOM requests this condition be modified as follows to reflect the EA: *'** Out of hours deliveries on a maximum of 50 days/nights per year'*

2.7 Rural Fire Service

No.	Comment	Response
RFS1	*The construction of the proposed office building shall comply with section 7 (BAL 29) Australian Standard AS3959−2009 "Construction of buildings in bush fire−prone areas' and section A3.7 Addendum Appendix 3 of "Planning for Bush Fire Protection".*	The attached revised SoC has been amended to reflect this requirement.

2.8 Hunter Regional Development Committee

No.	Comment	Response
HRDC1	*Given the number of trucks expected to enter and exit the proposed development, a Type AUR intersection / access should be constructed at the site access in lieu of the Type BAR.*	The traffic section of Lake Macquarie Council's asset management department assessed the intersection treatment based on the projected 2022 traffic figures from the AECOM *Traffic Assessment* (Appendix J of the EA). The intersection treatment is determined by the peak hourly traffic and turning movements. Based on Figure 4.5.12 – 'Warrants for Rural Turn Lanes' from Section 4 Intersections at Grade of the *Road Design Guide* (RDG), the minimum intersection treatment falls within the Type BAR treatment. This is, the Type BAR treatment falls within the RDG curve and the Austroads curve. It is further noted that the Weir Road is a local road under the care and responsibility of Council. On the basis of the above, CiviLake have advised they wish to proceed with a Type BAR intersection.

No.	Comment	Response
HRDC2	*Provision should be made for on−road cyclists at the intersection / access.*	At the current time, there is no provision for on-road cyclists along the Weir Road and CiviLake have advised that there are no plans for any such provision. It is considered that provision of a bicycle lane across the intersection alone would not improve safety for the intersection. Furthermore, provision of a bicycle lane would necessitate a widening of the intersection which would in turn would result in the intersection further encroaching on Ecologically Endangered Vegetation Communities (EEC). On this basis it is not proposed to provide a bicycle lane at the intersection / access.
HRDC3	*The line marking / sign posting plan for the intersection / access should make provision for truck turning signs.*	Truck turning signs will be provided.
HRDC4	*Street lighting should be provided at the intersection / access in accordance with Australian Standard AS I 158.*	CiviLake agree to provide street lighting at the intersection / access.
HRDC5	*The weigh bridge should be relocated further into the site to ensure vehicles do not queue back onto The Weir Road.*	It is noted that the scale bar on Figure 2.1 of the EA is not correct. The correct scale is shown on Drawing 60101141-DWG-10-CI0002-Rev 3 in Appendix B of the EA. As shown on drawing 60101141-DWG-10-CI0002-Rev 3, the northern end of the weighbridge will be located some 70m from the property boundary to allow a 20 metre long truck to be parked at the weighbridge and two 20 metre long trucks to wait on the Site. This is considered to be adequate given the likely usage of the facility. The weighbridge cannot be located further into the facility for operational reasons. Measures to be followed in the event that additional truck/s arrive while three trucks are already waiting at and behind the weighbridge will be documented in the construction and operational traffic management plans to be prepared as part of the CEMP and OEMP respectively.
HRDC6	*All roads and parking areas within the site should be sealed.*	The parking areas and the access road up to the Weighbridge are proposed to be sealed. However the remainder of the internal roads are proposed to be unsealed. The internal roads will be covered by a granular material. Appropriate dust and sediment control measures will be implemented for the Facility including the internal roads and will be documented in the CEMP and OEMP.

No.	Comment	Response
HRDC7	*A truck management plan should be prepared. This should include a restriction on vehicles travelling to and from the site immediately before and after school hours.*	Construction and operational traffic management plans will be prepared as part of the CEMP and OEMP respectively. However there are no plans to restrict the movements of trucks within the nominated hours of operation. As discussed in the AECOM *Traffic Assessment* (Appendix J of the EA), the additional traffic from the development is not considered to be significant and hence would not be considered to posed a significant additional risk to the schools along the haulage route. Furthermore such restrictions would pose significant constraints on the operations. CiviLake have advised that they have received advice that there is no legal basis to restrict truck movements during school hours and this cannot be a condition of consent.
HRDC8	*Further details regarding the internal operation of the site should be provided to Councils satisfaction, including how vehicles move through the site and where vehicles will park to load and unload materials.*	This information will be included in the construction and operational traffic management plans which will be prepared as part of the CEMP and OEMP respectively.
HRDC9	*The off−street car and truck parking associated with the subject development including aisle widths, parking bay dimensions, and loading / unloading bays are to be in accordance with AS 2890. I −2004 and AS 2890.2−2002.*	These standards will be utilised in developing the off−street car and truck parking during the detailed design of the Facility.
HRDC10	*All of the above should be to Council requirements*	The above works will be to Council requirements.

3.0 Angophora Inopina Trees along Western Site Boundary and Modifications to Access Intersection Design

3.1 Angophora Inopina Trees along Western Site Boundary

The *Ecological Impact Assessment* prepared by Ecotone in 2010 to inform the environmental assessment and the concept design development of the Facility identified nine *Angophora inopina* trees along the western site boundary of which seven were within the proposed perimeter bund footprint. The EA committed to retain these trees, where practicable, through provision of retaining walls around the trees.

Subsequently, an experience arborist, Russell Kingdom of Advanced Treescape Consulting was engaged to:

- Inspect the *Angophora inopina* trees potentially at risk from the proposed development*; and*
- Advise on the practicality of retaining the *Angophora inopina* trees and any design measures that would need to be incorporated during detailed design as well as management measures that would need to be implemented during and post construction to protect the trees.

A letter report from Advanced Treescape documenting their assessment is presented in Appendix H of this Submissions Report.

During his inspection Mr Kingdom identified an additional six *Angophora inopina* trees along the western boundary of the Site bringing the total to 15 of which 13 were within the proposed perimeter bund footprint.

Mr Kingdom observed that the *Angophora inopina* along the western site boundary *are* generally only young mature and there are only two of the trees inspected that have any seed pods visible on them. The trees are generally located between 0.6m and 4m within the boundary and they are randomly placed along the boundary.

A drainage ditch / swale currently runs close to the northern part of the western site boundary. AECOM, in the additional hydrological assessment documented in '*Sustainable Resource Centre, Teralba – An Assessment of the Hydrological Impacts of Site Development*' presented in Appendix E of this report concluded that a drainage ditch (or equivalent) along the western boundary is required outside the proposed perimeter bund to maintain the drying hydrology of the adjacent swamp forests within the tolerance limits of the vegetation that grows there. This conclusion was supported by Advanced Treescape who indicated that if a swale were not installed, *Angophora inopina* trees located in the adjoining block could be negatively impacted by water logging of soils to the west of the proposed bund. Advance Treescape considered this to be an unacceptable situation as the trees on the adjoining block are more mature than those on the Site. Given this advice, it is proposed to include a swale along the western perimeter of the project site in the detailed design of the Facility.

Advanced Treescape concluded that it is not practical to retain the 13 *Angophora inopina* trees along the northern portion of the western site boundary due to the location of the proposed swale and bund. Advanced Treescape further concluded that the replacement of the trees at a suitable ratio and their successful management into the future to maturity would be the most favourable outcome.

In addition, the previous proposal of protecting trees through provision of retaining walls around the trees was not considered suitable due to the identification of additional trees several metres inside the site boundary, the uncertainty of how retaining walls would affect the health of the trees and the requirement to provide a swale along the western site boundary to replace the existing drainage ditch.

It is noted that the design team considered adjusting the location of the proposed bund and swale further to the east to avoid the trees, however this would have involved significant loss of operational area and would have major implications for the commercial and operational viability of the proposed Facility.

Subsequent to the findings and advice from Advanced Treescape, Ecotone was engaged to conduct a further assessment of the significance of removal of the 13 *Angophora inopina* trees and consider potential offsets. Ecotone's letter report is presented in Appendix I of this report.

In its assessment, Ecotone considered the 13 principles for offsetting documented in DECCW '*Principles for the use of biodiversity offsets in NSW*.

Using the DECCW's biobanking calculator, Ecotone assessed that a total of 217 species credits would be required to offset the loss of the 13 trees from the site, equating to at least 91 healthy trees that would need to be

established in a suitable offset area by propagation of local seed and planting (translocation). This represents an offset ratio of approximately 7:1. Ecotone concluded that the population of *Angophora inopina* trees would remain viable in spite of the loss of 13 trees due to the presence of some 20 trees on-site in habitat that would not be impacted, numerous off-site trees (at least 52 individuals were found to occur within 30m of the site boundary and the population was noted to continue beyond this area) plus the 91 translocated trees in an offset area protected in perpetuity.

A suitable offset area to enable translocation of propagated stock of an appropriate number of Angophora inopina trees has been identified on Council land to the east of the subject site (between the existing Worm Farm and the fresh water wetland) in an area which is zoned 7(1) Conservation. CiviLake has advised that this area would be formally protected in perpetuity by a suitable legal mechanism, likely to be a S88B-E Covenant on the title of the land.

The Ecotone letter report included a template for an Offsets Management Plan for implementing the proposed Translocation of *Angophora inopina* trees.

Prior to commencement of construction and prior to removal of the *Angophora inopina* trees on the Site, CiviLake commit to:

- Preparing a detailed *Offsets Management Plan* (prepared by a suitably qualified consultant) and providing this to DECCW for approval.
- Obtaining the necessary licences for collection and propagation of seed from DECCW.
- Following obtaining the licence, collection of seed from mature *Angophora inopina* trees within the project site by a suitable arboriculurist/horticulturist and commencement of propagation of the seed at a suitable nursery.

In addition, CiviLake commit to:

- Establishing a minimum of 91 healthy *Angophora inopina* trees form the propagated seed in a suitable offset area nearby the Site (resulting in an offset ration of 7:1 for the 13 *Angophora inopina* trees to be removed on the Site).
- Monitoring and maintenance of the *Angophora inopina* offset area in accordance with the approved *Offsets Management Plan.*
- Formally protecting the *Angophora inopina* offset area by a suitable legal mechanism, likely to be a S88B-E Covenant on the title of the land.

The Statement of Commitments provided in the EA has been revised to reflect the above commitments (see Appendix B to this report).

Ecotone concluded that it is confident that the revised offsets strategy proposed will result in a 'maintain or improve' outcome with respect to biodiversity in general, and *Angophora inopina* in particular.

3.2 Access Intersection

Based on the concept design, it was estimated that approximately 100m^2 of swamp EEC would be removed at the proposed access intersection which would form the main access to the site from The Weir Road from the south. Minor modifications to the design of the intersection (through the detailed design process) will now result in approximately 200m^2 in the south-eastern corner and 400m^2 in the south-western corner of degraded and weedy swamp EEC being permanently removed at the edge of The Weir Road. These modifications to the entry intersection design are required for road safety purposes.

The revised area to be impacted was inspected on 13 January, 2011 by Ecotone who advised that, as previously discussed in the impact assessment report and other correspondence, the habitat for the EEC in the revised area of impact was in poor condition and very weedy, with few native species. Being at the edge of a major road, the habitat is constantly subject to edge effects including runoff, rubbish dumping and weed invasion from The Weir Road. A few common Melaleuca shrubs or trees and other native shrubs or herbs that make up the EEC would be removed by the proposed road intersection.

Ecotone noted that the small area of EEC to be disturbed was in very poor condition due to its roadside location and the area to be impacted was only a very small percentage of the EEC. A large area of the EEC in much better condition occurs within the south-western corner of the site in an area that would not be developed and would be managed and monitored as part of the CEMP / OEMP. Ecotone further noted that extensive areas of the EEC occur in the vicinity of the subject site and in other areas of the locality. Given these considerations, together

with the location and poor conservation value of the small area of near roadside habitat to be removed, Ecotone concluded that the recent minor modifications to the design of the entry intersection would not alter the original conclusion in the 2010 *Ecological Impact Assessment* that the EEC would not be significantly impacted upon.

This advice is also documented in Ecotone's letter report in Appendix I.

Appendix A

Copy of Submissions on the EA

NSW GOVERNMENT | Planning

Contact: Emma Barnet
Phone: (02) 9228 6550
Fax: (02) 9228 6466
Email: emma.barnet@planning.nsw.gov.au

Our ref: S07/00084

Mr Joshua Lasky
AECOM
Level 5, 828 Pacific Highway
GORDON NSW 2072

Dear Mr Lasky,

Subject: Teralba Sustainable Resource Centre MP 08_0079 – Issue of Submissions

The exhibition of the Environmental Assessment for the above project ended on Friday 1 October 2010. Please find enclosed copies of the submissions received by the Department during the exhibition.

The Department has reviewed the EA and has raised issues in relation to noise, stormwater, traffic and flora and fauna. Details are provided at **Attachment 1**.

The Director-General, pursuant to s75H(6) of the Act, now requires a response to the issues raised in all submissions to be provided. It is requested that a response be submitted within one month from the date of this letter. If you are unable to meet this timeframe please contact the Department.

A preferred project report is to be prepared if changes are proposed to the project to minimise its environmental impact. If a preferred project report is to be prepared, please advise the Department. In addition, a revised statement of commitments is to be provided incorporating any amendments following your response to the submissions.

If you have any queries regarding this letter, please contact Emma Barnet on the above details.

Yours sincerely,

Felicity Greenway 7/10/10

Felicity Greenway
Team Leader - Industry
Mining and Industry

Attachment 1 Department of Planning issues 08_0079

Attachment 1 Department of Planning issues 08_0079

1. **Noise**
   - The data noise logger used to monitor ambient and background noise levels was placed at the site rather than the nearest sensitive receivers. Please Justify.
   - Did the noise assessment take the 3m change in site level into consideration?
   - Clarify why the existing noise levels on York Street is high. Was monitoring undertaken, if so where?
   - Clarify what is meant by after hours delivery, between what times.
   - Provide an assessment of traffic noise impacts on Barnsley Public School as well as residents along The Weir Road and Northville Drive.
   - Note: York Road is a local road with a ECRTN criteria of LAeq(1hr) 55 dB(A) day and LAeq(1hr) 50 dB(A) night.

2. **Soil**

a. There is no information regarding the impacts of the stockpiles at the temporary offsite stockpiles areas. Theses sites will not be included in the approval unless additional information is provided.

b. Provide additional information about the potential impacts of, and mitigation measures for, onsite stockpiling of capping material.

c. p 19 states '*placement of fill may only occur over clean existing uncontrolled fill'.* Please clarify this sentence in light of the preferred remediation strategy.

d. Further clarification and information is required regarding removal of contaminated fill.

3. **Water**
   - So that results can be verified, provide the data and assumptions used for the Water Cycle Management Plan.
   - p17 of the Water Cycle Management Plan shows that a catchment area of 3.5 ha was used in the MUSIC model. According to the EA the site is 7ha. Why wasn't the whole site included in the model?
   - Confirm the capability of the bunds for sewage application. Identify the specific areas proposed for the application of sewage.
   - Was the document *"Water Sensitive Urban Design Solutions for Catchments above Wetlands" Hunter and Central Coast Regional Environmental Management Strategy"* taken into consideration?
   - Undertake a hydrological assessment to determine the current regime of the SEPP 14 wetland, EEC and the area containing the *Angophora inopina* (*Angophora inopina* is sensitive to changes to the water table and hydrological processes). The assessment should determine the wetland hydrology objectives (please provide hydrologic curves showing minimum and maximum 30 day flow duration curves vs AEP's).
   - Provide details on how CiviLake proposes to maintain the current hydrological regime. Including the same low flow volume, frequency and magnitude of peak flow.
   - What is the size of the catchment draining to the wetland?

4. **Traffic**
   - Clarify why there are reduced delays at Griffin Road due to development traffic.
   - What is the size of the trucks that will be used to import fill? Are there any specific times proposed for transportation of fill?
   - Further justification is required as to why the proposed sporting fields weren't considered in the cumulative assessment, particularly Saturday mornings and weekday evenings.
   - Clarify why the facility would have its peak operation during weekday mornings? Between what times?

- During which hour were the traffic counts taken?
- Detail contingency measures in case of flooding over the weir on the Weir Road.

5. **Flora and Fauna**
   - Clarify how the bund will be constructed without disturbing the adjacent EEC.

6. **Bushfire**
   - Note: p12-5 A.S 3959 was updated in 2009.

7. **Statement of Commitments**
   - The Soc is to be rewritten to read will instead of would.

8. **Greenhouse gas- energy reduction**
   - p18-4 gives a list of recommendations, which ones if any, do CiviLake commit to? Please add to the Statement of Commitments.

(1)

FAXED 23/9/10

20th September 2010.

The Director General
Department of Planning
Fax: 9228 6455

Re: Teralba Waste Recycling Project no: 08_0079

I am writing to you to lodge a submission of objection to project number 08_0079 which was lodged by Lake Macquarie City Council, trading as CivilLake, for a recycling facility at Teralba.

My main objections are based on the ecological impact this proposed plant could have on this area:

- The proposed site and the surrounding area is already recognised by Lake Macquarie City Council as a major flood plain. Any fill, let alone the large amounts of fill proposed for this site will have an obvious impact via an increase in flooding to the lower lying residences and suburbs of this area, such as Barnsley, Edgeworth, Glendale, Boolaroo, and of course Cockle Creek and Teralba. These areas have already experienced major inundation in the last flood of June 2007. Any further filling of this floodplain is totally irresponsible. (*it is noteworthy that any past attempts by other landholders or leaseholders in the area to fill even minor parts of their land has been disallowed by council.)*
- My other main concern is the natural wetlands that surround this proposed site. Any overflow, or even rainfall runoff, no matter how small will enter the adjacent wetland which in turn flows directly into Cockle Creek and then in to the northern end of Lake Macquarie. Any silt or contaminants on this site have the potential to either leach through the soil into the water table or run directly into the wetland system. This is a large breeding area for fish and other native animals and is especially important to the birdlife that survive on it's ecosystem. Some of this wetland area would be the only natural fresh water swamplands for a great distance.

I declare that I am not aligned to any political party and make absolutely no donation to any political parties.

I DO NOT wish my name to be made public. I require my name to be kept private from the proponent.

Finally, I must state that I find it surprising that there has been a call for submissions to support or object to this major proposal at this late stage, when it is very obvious that a significant amount of time and money has already been expended by Lake Macquarie Council in establishing this project over the last three months.

Yours sincerely.

[redacted]

[redacted] Third Street, Booragul NSW 2284

Department of Planning
Received
23 SEP 2010
Scanning Room

Emma Barnet - Objection to Teralba Waste Recycling Project (08_0079) by KatrinaCollyer

From: Ross Collyer [redacted]
To: <plan_comment@planning.nsw.gov.au>
Date: 26/09/2010 8:35 AM
Subject: Objection to Teralba Waste Recycling Project (08_0079) by KatrinaCollyer

Katrina Collyer

3 Gardner Street, Dudley NSW 2290

Teralba Waste Recycling Project (08_0079)

I am in the process of buying Lot 3 DP 32484 known as 158 The Weir Road Teralba from Alexandra and Justin Woodbine. It is proposed that a submission for this house will be presented to Lake Macquarie City Council by Coral Homes in the coming weeks.

I would like to object to this proposal on the following basis:

1. Increase in the amount of **trucks** using The Weir Road. There are already a substantial number of heavy trucks using this road and the increase in truck usage proposed would be a huge problem
2. The **weir crossing** between the proposed site and the Barnsley Primary School is already dangerous and at times unsuitable for traffic to cross and the increase in usage would again be a substantial problem
3. Concern over the amount of **noise** this project would create for nearby residents
4. Concern over the **dust** this project will create for houses that are South West of the proposed site
5. Concern over the **odour** this project will create for houses that are South West of the proposed site
6. Concern of the **noise** during night hours that will be created by machinery operating with loading and unloading trucks

Katrina Collyer

Emma Barnet - Objection to Teralba Waste Recycling Project (08_0079) by Andrewand Claire Kolasinski

From: Claire Kolasinski [redacted]
To: <plan_comment@planning.nsw.gov.au>
Date: 26/09/2010 9:49 AM
Subject: Objection to Teralba Waste Recycling Project (08_0079) by Andrewand Claire Kolasinski

Andrew and Claire Kolasinski

12 Diana Street, Wallsend NSW 2287

Teralba Waste Recycling Project (08_0079)

We own Lot 1 DP 32484 known as 190 The Weir Road Teralba.

We would like to object to this proposal as we are concerned for the following reasons:

1. Noise levels will increase
2. The odour that will be produced
3. The amount of dust that will be produced
4. The increase in traffic, especially trucks over the weir road

Andrew and Claire Kolasinski

4

SUBMISSION OF CONCRUSH PTY LTD ACN 097 606 543 BY WAY OF OBJECTION TO A PROJECT APPLICATION UNDER PART 3A OF THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT NUMBER 08_0079 OF LAKE MACQUARIE CITY COUNCIL TITLED "CIVILAKE CONSTRUCTION AND GREEN WASTE RECYCLING FACILITY - TERALBA"

Director General
Department of Planning
GPO Box 39
SYDNEY 2001

By Express Post
Facsimile: 9228 6466
Email: plan_comment@planning.nsw.gov.au

Dear Sir,

Concrush Pty Ltd ACN 097 606 543 a company duly incorporated and having its registered office at 21 Racecourse Road Teralba 2284 hereby objects to approval by the Minister for Planning of the abovementioned application number 08_0079. In making this submission Concrush Pty Ltd states that neither the company nor its directors have made either by themselves or by an associate of them in the two years prior to the date of this submission any political donation of $1,000.00 or more or any political donations which when aggregated with others made in the same financial year ending 30 June 2010 total $1,000.00 or more.

The grounds for objection are as follows:-

1. Lack of jurisdiction to approve

1.1 The environmental assessment requirements prepared by the Director General ("Director General's requirements ("DGRs")") were notified to the proponent on 6 May 2008.

1.2 The DGRs were expressed to have a life of two years from the date of their notification (*"source?)*.

1.3 The Environmental Assessment ("EA") is dated 3 August 2010. The EA was lodged with the Director General on a date unknown to this objector but after 3 August 2010.

1.4 At the date of that lodgement there were no DGRs in existence, the previously notified DGRs having expired before that time.

1.5 There were no DGRs current at the date of lodgement of the EA in respect of the proponent's project (as required by s.75F of the Environmental Planning & Assessment Act ("EPA Act")).

1.6 There are no DGRs to be considered by the Director General in respect of the proponent's project as required by s.75H of the EPA Act.

1.7 Similarly there were no DGRs which pursuant to s.75H of the EPA Act were to be addressed by the EA.

1.8 The Director General is unable to provide to the Minister as required by s.75I(2) a statement relating to compliance with the DGRs with respect to the project.

1.9 Accordingly the Minister is unable to comply with the provisions of s.75J(2) of the EPA Act in that the requirements of that subsection to be considered by the Minister do not exist in relation to the EA.

In these circumstances any purported approval given by the Minister to the project will be null and void.

2. Inadequacy of Environmental Assessment

The EA is deficient in that it does not deal with or deal adequately with the following issues:-

2.1 As exhibited the flood study forming part of the EA did not contain Appendices E - HEC-RAS Output Data 100 year ARI Event with Climate Change Considered and F - Impact of Loss of Flood Storage.

The Objector is unable to consider properly the adequacy of the flood study in the circumstances that Appendices E and F have not been part of the exhibition of the proposal.

2.2 The proposal set out in the EA involves the raising of the natural ground level by between two and three metres by the importing and depositing of approximately 200,000 tonnes of fill. Such is a major part of the proposal. The EA does not deal with the impacts of such fill.

2.3 The proposed development is an extractive industry within the meaning of that expression as contained in Schedule One ("Extractive Industry Related Works").

2.3.1 That part of the proposal as relates to the filling of the land falls within the definition of "extractive industry" as contained in Schedule One Part 3A SEPP (Major Developments) 2005.

2.3.2 The "extractive industry related works" is ancillary to the Part 3A project comprised in the application.

2.3.3 The provisions of s.75B(3) of the EPA Act apply to the "extractive industry related works" and are to be addressed by the EA.

2.3.4 The EA does not identify, characterise or particularise the impacts of the "extractive industry related works".

2.4 The Traffic Assessment Report exhibited as Appendix J to the EA:-

2.4.1 Fails to assess or to assess adequately the impact of the proposed development on Five Islands Road a State road classification MR 217 as a major arterial route along the west coast of Lake Macquarie.

2.4.2 Provides no assessment of existing traffic conditions within the villages of Teralba and Barnsley and no assessment of the impacts of traffic generated by the proposed development on those conditions. In particular there is no assessment of the use of the proposed haulage routes at school times and the impact of traffic generated by the development on school frontages and school bus routes, pedestrian cluster points and the impact of additional traffic on the local amenity of the villages of Teralba and Barnsley.

2.4.3 Fails to provide an assessment of the impact of traffic generated by the facility on sporting/recreational facilities in the area given that Tables 4.1 and 4.2 of the Report state that the facility will operate six days a week.

2.4.4 Fails to assess pm peak traffic impacts having regard to school peak traffic and trade peak traffic in the pm period. Inconsistently the report suggests that the facility will have inwards traffic up to 4pm whilst outwards traffic will cease at 3pm.

2.4.5 Fails to identify whether the general public will have access to the facility and if so at what times, and to provide an assessment of the impact of such access on traffic.

2.4.6 Fails to assess the impact on existing vulnerable road users along the haulage route within a reasonable area of influence of the proposed site.

2.4.7 Fails to identify all potential traffic generators and impacts.

2.5 The Analysis on the Impact of Flooding in Cockle Creek for Proposed Construction Waste Recycling Facility exhibited as Appendix G ("Flood Report") to the EA:-

2.5.1 Relies, at section 6, on flow data derived from a 1986 study. The flows adopted do not take into account the effects of development within the contributing catchment over the past 24 years. The effects of such development over that period are likely to have resulted in an increase in peak water flow. The flood report does not address this likely increase either

by way of its nature or impacts on the development site and surrounding lands.

2.5.2 Uses a HEC-RAS model to investigate the impacts of the proposed filling of the site. This model is simply a one-dimensional flood model and is unlikely to adequately consider flood storage effects or hydraulic processes within the flood plains (i.e., the development site). It is likely that the adoption of this model could result in a gross underestimation of flood impacts resulting from the filling of the site.

2.5.3 Adopts as its premise only a simple volumetric analysis of the impact of filling of flood liable land (the development site). The Flood Report does not undertake any accurate assessment of the impacts of the filling of flood liable land comprised in the site. This analysis is extremely rudimentary and is likely to be inadequate given the complex hydraulic process occurring within the floodplain.

2.5.4 Does not contain Appendix F which, as referenced by section 9 of the Flood Report, contains calculation of that volumetric analysis. A detailed and reasonable assessment of that volumetric analysis accordingly is unable to be carried out.

2.5.5 Fails to provide an assessment of the potential of floodwaters to scour and destabilise the proposed fill batters (refer clause 4.3 below).

2.6 The Concept Design Drawing Package exhibited as Appendix B ("Concept Design") to the EA:-

2.6.1 Fails to provide an assessment in terms of potential geotechnical impacts of the placing of a large amount of fill over the flood plain. (refer clause 4.1 below).

2.7 The Water Cycle Management Plan exhibited as Appendix F ("Water Cycle Plan") to the EA:-

2.7.1 Does not include enough technical foundation and justification (i.e., input parameters and output results) to enable a reasonable assessment of water quantity determination (i.e., peak flow, volumetric calculations, etc) or water quality treatment (i.e., MUSIC source generation parameters, treatment train design parameters, etc).

2.7.2 Does not consider the effect which the proposed filling of the Development Site will have on overland flow to and from neighbouring properties. (refer clause 4.2 below).

3. Planning Issues

3.1 The project is permissible development as "waste management and/or recycling facility" within the subject land which is zoned 9 Natural Resources pursuant to Lake Macquarie Local Environmental Plan 2004 ("LEP 2004").

3.1.1 The project is not consistent with the relevant objectives as set out in the table to clause 15 of LEP 2004 for Zone 9 Natural Resources.

3.1.2 Clause 16 of LEP 2004 provides that consent must not be granted for such development unless the consent authority is satisfied that the proposed development is consistent with those zone objectives.

3.1.3 Accordingly pursuant to the provisions of clause 8O of the Environmental Planning & Assessment Regulation 2000 ("EPA Regulation 2000") the Minister is precluded from granting approval for the carrying out of the project under Part 3A of the EPA Act.

3.2 The site of the proposed development is flood prone land within the meaning of LEP 2004. In this respect:-

3.2.1 Clause 32 of LEP 2004 provides that before granting consent for development on flood prone land the consent authority must *inter alia* be satisfied that to carry out the development in accordance with the proposed consent would be consistent with flood hazard and levels of risk that are acceptable to the community.

3.2.2 In the light of the inadequacies of the EA the Minister could not be satisfied that to carry out the development would be consistent with the flood hazard and levels of risk that are acceptable to the community within the meaning of clause 32 of LEP 2004.

3.2.3 Accordingly pursuant to the provisions of clause 8O of the EPA Regulation 2000 the Minister is precluded from granting approval for the carrying out of the project under Part 3A of the EPA Act.

4. Engineering Issues

4.1 Consolidation processes due to site filling are likely to result in differential surface settlement of the development site once filled. Such differential surface settlement will affect the integrity of development structures and services as well as the potential to impound and significantly alter ground water movement.

4.2 The placement of substantial quantities of fill is likely to impound overland flow of water resulting in changes in the surface and sub-surface hydraulics.

4.3 Peak water velocities in times of flood will have the potential to:-

4.3.1 Erode earthfill embankments;

4.3.2 Cause downstream environmental erosion and deposition; and

4.3.3 Destabilise site structures.

4.4 It is likely that the importing of fill during earthworks operations will necessitate as many as 10,000 truck movements to and from the development site. These movements will generate massive traffic and acoustic impacts on Five Islands Road and the villages of Barnsley and Teralba.

5. Traffic Issues

The EA Traffic Assessment Report Exhibit J focuses solely on road capacity. It omits any analysis of the impact of the proposed development on the safety of vulnerable road users identified in paragraph 2.4 above.

Concrush Pty Ltd requests that you have regard to the above submissions in assessing the numerous issues raised by these submissions.

Concrush Pty Ltd respectfully requests that you:

(a) refuse to consider the Environmental Assessment further pursuant to s.75H of the EPA Act; and

(b) decline to give a report to the Minister for Planning recommending any form of approval in respect of the proposed Project in view of the serious and substantial issues set out in the above submission.

Dated: 30 September 2010

SIGNED FOR AND ON BEHALF OF)
CONCRUSH PTY LTD ACN 097 606 543)
by its Director:-)

A. C

ANTHONY CONAGHAN

NSW GOVERNMENT | Environment, Climate Change & Water

Our reference : DOC10/44121
Previous DECCW Correspondence : DOC10/31123; DOC10/22427
DOC10/6378

Mr Chris Ritchie
Manager Major Industry
Department of Planning
GPO BOX 39
SYDNEY NSW 2001

Attention: Ms Felicity Greenway

Electronic Mail & Standard Post

6 October 2010

Dear Sir

Recommended Conditions of Approval - Proposed Waste Processing Facility – Weir Rd, Teralba – CiviLake Pty Ltd (a business Unit of Lake Macquarie City Council) – Part 3A EP&A Act 1979

I refer to your letter dated 8 July 2010 and received on 12 July 2010 seeking advice on the adequacy of a revised Environmental Assessment ("revised EA") submitted by CiviLake, a business unit of Lake Macquarie City Council ("the Proponent").

The Proposal was provided under the provisions of part 3A of the *Environmental Planning and Assessment Act, 1997,* and outlined a proposal for the construction and operation of a waste processing and storage facility ("the Proposal") at Lots 42, 43, 53 and 54 in DP 16062 also known as Wier Rd, Teralba, NSW ("the Premises").

Please note that, although the Environment Protection Authority ("EPA") is now a part of the Department of Environment, Climate Change and Water ("DECCW"), certain statutory functions and powers continue to be exercised in the name of the EPA.

On 14 July 2010 DECCW provided advice to the NSW Department of Planning that the revised EA was adequate to be publicly exhibited, and that DECCW would undertake a comprehensive review of the revised EA at the conclusion of the exhibition period.

On 27 August 2010 DECCW received correspondence from the NSW Department of Planning advising that the Proposal was to be publically exhibited from 26 August 2010 until 23 September 2010.

On 23 September 2010 the NSW Department of Planning advised the DECCW that the public exhibition period had further been extended until 1 October 2010. On 1 October 2010 DECCW was provided the submissions which had been received by the NSW Department of Planning in respect of the Proposal.

PO Box 488G, Newcastle NSW 2300
117 Bull Street, Newcastle West, NSW
Tel: (02) 4908 6800 Fax: (02) 4908 6810
ABN 30 841 387 271
www.environment.nsw.gov.au

Recommended Conditions of Approval

DECCW notes that the NSW Department of Planning is the appropriate authority for the determination of planning proposals under Part 3A of the *Environment Planning and Assessment Act, 1979*. As such the DECCW now provides its recommended conditions in Attachment A to the NSW Department of Planning for its consideration, should it provide planning approval for Proposal (enclosed).

DECCW considers that a key issue is the suitability of the location of the Proposal, specifically the proximity to Cockle Creek and its floodplain and adjacent to a SEPP 14 wetland. DECCW notes that concerns regarding flooding and water quality impacts were also raised in submissions to the NSW Department of Planning in response to the exhibited revised EA.

DECCW also considers that a key issue is the proposed management of waste (including stockpile management) and the location of power lines which pose some ignition risk for combustible material at the Premises.

Should consent be provided for the Proposal, DECCW has included conditions in its recommended conditions of approval in respect to these issues (Attachment A enclosed).

DECCW reminds the Proponent that should an Environment Protection Licence be provided in respect to the Proposal in the future, DECCW will include appropriate conditions on that licence to reduce the risk of environmental harm occurring from the licensed premises.

Environment Protection Licence Application Process

DECCW reminds the Proponent that an application for a relevant Environment Protection Licence for scheduled activities is required to be submitted to DECCW prior to these activities occurring. Allocation of up to 60 days for review, assessment and processing of any licence application should be provided in this regard.

If you have any further questions regarding this matter please do not hesitate to contact Rebecca Small on (02) 4908 6892.

Yours sincerely

ROB HOGAN
Manager Waste Operations
Department of Environment, Climate Change and Water

Attachment A – DECCW's Recommended Conditions of Approval (enclosed)

Recommended Conditions of Approval -
Proposed Waste Processing Facility – Weir Rd, Teralba –
CiviLake Pty Ltd (a business Unit of Lake Macquarie City Council)

PART OF DOC10/44121

THE PROPOSAL

CiviLake, a business unit of Lake Macquarie City Council ("the Proponent") has provided a revised Environmental Assessment ("revised EA") after consultation with the Department of Environment Climate Change and Water ("DECCW") and the NSW Department of Planning under the provisions of part 3A of the *Environmental Planning and Assessment Act, 1997.*

The revised EA outlines the proposed construction and operation of a waste processing and storage facility ("the Proposal") at Lots 42, 43, 53 and 54 in DP 16062 also known as Wier Rd, Teralba, NSW ("the Premises"). The Premises was previously used for the disposal of biosolids and other fill.

The Proposal includes the acceptance of up to 200,000 tonnes per annum of waste for processing and storage at the Premises including concrete, asphalt, road base, green waste, bricks, tiles and soil waste.

The Premises is located approximately 2 kilometres north of Teralba on a floodplain within Cockle Creek. Cockle Creek is located approximately 200 metres from the boundary of the Premises. The Premises is also adjacent to a SEPP 14 wetland to the south east of the Premises, and vegetation in the surrounding buffer area contains tree species for Koala habitats listed under SEPP 44.

The Proposal includes advice that Premises will be raised 1.5 to 2.5 metres above the existing levels with an estimated 200,000 tonnes of waste material including virgin excavated natural material ("VENM") and excavated natural material ("ENM") sourced from multiple sources including from Lake Macquarie Council's road works and drainage works.

The Proposal includes the undertaking that waste used to raise or fill the Premises, and waste processed for reuse outside the Premises, will be done in compliance with all relevant legislation, including DECCW's Resource Recovery Exceptions.

DECCW's CONDITIONS OF APPROVAL

ENVIRONMENTAL MANAGEMENT PLANS

(1) The Proponent will develop and implement an Environmental Management Plan prior to construction commencing at the Premises.

(2) The Proponent will develop and implement an Operational Environmental Management Plan at the Premises prior to conducting scheduled activities which require an Environment Protection Licence with the EPA.

INFRASTRUCTURE DESIGN

Contaminated Water Management

The Proponent shall:

(3) ensure that water from areas of the Premises used to store, handle or process waste, or that has been contaminated by waste:

(a) is treated as dirty water;

(b) drains to the dirty water dam(s).

Dirty Water Dam(s)

(4) The Proponent shall ensure that the dirty water dam(s) at the Premises:

(a) are capable of accepting dirty water generated in a 1 in 2 year, 24 hour duration storm event without overflowing;

(b) have a re-compacted clay or modified soil layer that is at least 900 mm thick and an in situ coefficient of permeability of less than 1×10^{-9} m/s, or some other suitable liner approved by DECCW;

(c) have a shut off valve which can be closed to prevent water discharge off the Premises installed as part of the design; and

(d) are managed so that all material contained within leachate dam(s) does not turn anaerobic.

Capping

(5) The Proponent shall:

(a) install a suitable capping layer over contaminated areas of the Premises; and

(b) ensure that the base of the capping layer is clearly marked.

Filling

(6) The Proponent shall:

(a) ensure that a baseline survey is completed by a qualified surveyor prior to construction work commencing for the area of the Premises to be raised or filled ("baseline survey"). The baseline survey should include:

- information on the land height of the premises; and
- a surveyor's map which depicts the landform height prior to filling at the Premises.

(b) ensure that only one of the following volume of waste is used to raise the height of the Premises, which ever one is lesser;

- 200,000 tonnes; or
- raised to a level to prevent a 1 in 100 year rain event flooding the Premises.

(c) ensure that only VENM, EMN, or other waste approved in writing by the EPA for use, is used to raise the height of the Premises above the level in the baseline survey;

(d) ensure filling of the Premises is done in accordance with any requirement(s) by the power line company to which the power easement is owned;

(e) ensure that the proposed footprint for the Proposal remains within the area depicted in figure 1 titled "Proposed Site layout – Environmental Assessment" by AECOM project ID s70075 dated 24-06-2010.

Construction of perimeter bund

(7) The Proponent must install a perimeter bund:

(a) prior to waste processing activities occurring at the Premises;

(b) to a specification which would prevent flood waters entering the Premises from a 1 in 100 year flood event of Cockle Creek; and

(c) avoids the tree species depicted in figure 1 titled "Proposed Site layout – Environmental Assessment" by AECOM project ID s70075 dated 24-06-2010.

WASTE MANAGEMENT

Limits on Inputs

(8) The Proponent shall not receive:

(a) any waste that's is not Excavated Natural Material ("ENM"), Virgin Excavated Natural Material ("VENM"), soil, concrete, asphalt, road diggings, bricks, tiles, timber waste, green waste;
(b) more than 200,000 tonnes of waste received each year on site;
(c) waste on site that is contaminated by chemicals and/or pathogens that would not be rendered harmless by operations on site, or that may constitute a health or environmental risk, including clinical and related waste and diseased carcasses;
(d) putrescible waste including biosolids and food wastes; and
(e) classified as hazardous waste, liquid, restricted or special wastes under the *Protection of the Environment Operations Act,* 1997.

Waste Acceptance & Screening

(9) The Proponent shall:

(a) classify waste received at the Premises in accordance with the DECCW's *Waste Classification Guidelines, 2008*;
(b) Implement a recording a documentation system for waste received and removed from the Premises. This should include, but not be limited to
- types of waste (waste classification);
- volumes;
- time and date received

(c) Implement suitable procedures to:
- ensure that the site does not accept wastes that are prohibited; and
- screen incoming waste loads; and
- ensure that all staff receive adequate training in order to be able to recognise and handle any hazardous or other unapproved waste.

Waste Outputs

(10) The Proponent shall dispose of all outputs produced at the Premises to a place that can lawfully receive that waste.

Waste Storage

(11) The Proponent must store all waste:

(a) which is combustible 20 metres or more away from identified bushfire prone vegetation; and
(b) outside transmission easement zones.

NOISE

(12) Proponent shall ensure that the road traffic noise generated by the project does not exceed the criteria in the DECCW's *Environmental Criteria for Road Traffic Noise.*

(13) Sound barrier walls must be:

(a) completely installed prior to the tub-grinder or crusher being operated at the Premises; and
(b) designed to have a minimum crest height of 3 metres above the height of the finished fill level.

Note: The finished fill level is above the height of the Premises depicted in the baseline survey.

(14) All plant and equipment used at the Premises with audible alarm systems or audible alarm devices are to:

(a) be broadband type audible systems;
(b) not to exceed 85 dB(A) when measured at a distance of 7 metres directly behind the rear of that machine or equipment; and
(c) have BBS-TEK Alarms – medium and light duty model 600-BBS 087 or the equilivent performance.

Operating Hours

(15) The Proponent shall:

(a) comply with the operating hours in Table 1; and
(b) record the time and date of all waste deliveries to the Premises after hours.

Table 1: Teralba Sustainable Resource Centre Operating Hours

Activity	***Day***	**Hours**
Construction	Monday - Friday	7 am – 6 pm
	Saturday	8 am – 1 pm
	Sunday & Public Holidays	Nil
*Hours of Operation **	Monday - Friday	7 am – 6 pm
	Saturdays	7 am – 1 pm
	Sunday & Public Holidays	Nil
Hours for receipt of Waste	Monday – Friday	7 am – 6 pm
	Saturdays	7 am – 1 pm
	Sunday & Public Holidays	8am – 5pm
*After hours deliveries ***	Monday - Sunday	Anytime other than specified above
Emergency	Monday - Sunday	Anytime

** Waste Operations includes crushing, grinding and processing activities*
*** Max. 50 out of hours deliveries per year.*

(16) The Proponent shall ensure that the noise generated by the Proposal does not exceed the limits in Table 2 (below):

Table 2: Noise impact assessment criteria dB (A)

Receiver / Location	***Day*** $L_{Aeq(15\ minute)}$	***Evening*** $L_{Aeq(15\ minute)}$	***Night*** $L_{Aeq(15\ minute)}$	***Sleep disturbance*** dB(A) L_{A01}
Receiver 1 – Martin Place, Teralba (residential)	47	38	38	53
Receiver 2 – The Weir Rd, Teralba (residential)	45	35	35	53

Notes:

(a) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance with the $L_{Aeq(15\ minute)}$ noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

(b) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holiday's; evening is defined as the period 6pm to 10pm; night is

defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holiday's.

(c) The noise emission limits identified in the above table apply under meteorological conditions of:

- *wind speeds of up to 3 m/s at 10 metres above ground level; or*
- *temperature inversion conditions of up to 3 ° C/100 m and wind speeds of up to 2 m/s at 10 metres above ground level.*

WATER

Discharge Limits

(17) Except as may be expressly provided in an Environment Protection Licence for the Proposal, the Proponent shall comply with section 120 of the POEO Act.

Note: Section 120 of the POEO Act, provides that any person who pollutes any waters is guilty of an offence.

(18) Stormwater from all areas of the Premises which has the potential to mobilise sediments and other material outside the Premises must be controlled and diverted through appropriate erosion and sediment control/pollution control measures/structures.

Bunding

(19) The Proponent shall store and handle all dangerous goods (as defined by the Australian Dangerous Goods Code) oils, fuels and chemicals at the Premises strictly in accordance with:

(a) all relevant Australian Standards;
(b) a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and
(c) the bund must be impervious, heat and chemical resistant.

ABORIGINAL AND CULTURAL HERITAGE

(20) In the event that Aboriginal objects are uncovered during the course of the Proposal, then work in the immediate areas shall cease; the appropriate authorities shall be notified; and expert archaeological advice must be sought from an appropriate qualified professional. Works may only commence in this area of the Premises with the written approval of the appropriate authorities.

Note: The appropriate authorities are the Local Aboriginal Land Council and the NSW Department of Environment Climate Change and Water.

GENERAL CONDITIONS

Odour

(21) Unless as otherwise expressly provided in any Environment Protection Licence condition for the Proposal, the Proponent must comply with section 129 of the POEO Act.

Note: Section 129 of the POEO Act, provides that the Proponent must not cause or permit the emission of any offensive odour from the boundary of the Premises.

Dust & Particulate Matter

(22) The Proponent must maintain the Premises in a condition which prevents the emission of dust and particulate matter past the boundary of the Premises.

Fire Management

(23) The Proponent shall:

(a) implement suitable measures to minimise the risk of fire at the Premises;
(b) extinguish any fires at the Premises promptly; and
(c) maintain adequate fire-fighting capacity at the Premises.

Lighting
(24) The Proponent shall ensure that all external lighting associated with the development does not create a nuisance to surrounding land including properties or roadways.

BIODIVERSITY & VEGETATION

Litter, Pest, Vermin and Noxious Weed Management
(25) The Proponent shall:
(a) implement suitable measures to prevent the unnecessary proliferation of litter both on and off the Premises; and
(b) inspect and clear the Premises (and if necessary, surrounding area) of litter on a daily basis;
(c) implement suitable measures to manage pests, vermin and declared noxious weeds at the Premises; and
(d) inspect the Premises on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on the Premises in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in the surrounding area.

Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Noxious Weed Act 1993.

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PCU015012

Director, Major Development Assessments
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Felicity Greenway

FIVE ISLANDS ROAD (MR217) - WASTE RECYCLING PROJECT, THE WEIR ROAD, TERALBA (08_0079)

Dear Ms Greenway

I refer to your letter received on 26 August 2010 (Your reference: S07/00084) regarding the subject project application forwarded to the Roads and Traffic Authority (RTA) for consideration.

RTA Responsibilities and Obligations

The RTA's primary interests are in the road network, traffic and broader transport issues, particularly in relation to the efficiency and safety of the classified road network, the security of property assets and the integration of land use and transport.

In accordance with the *Roads Act 1993*, the RTA has powers in relation to road works, traffic control facilities, connections to roads and other works on the classified road network. The Weir Road is an unclassified local road. RTA concurrence is not required for connections to this road. Council is the roads authority for this road and all other public roads in the area.

In accordance with the *State Environmental Planning Policy (Infrastructure) 2007* this application meets the requirements under *Clause 104* and *Schedule 3 Column 2* for referral to the Hunter Regional Development Committee (HRDC). The HRDC will consider the application and provide comments separately.

RTA Response and Requirements

The RTA has reviewed the information provided and has no objections to or requirements for the proposed development as it is considered that there will not be a significant impact on the classified (State) road network.

On the Department of Planning's determination of this matter, it would be appreciated if a copy of the development consent were forwarded to the RTA for record purposes.

Please contact me on (02) 4924 0240 if you require further advice.

Yours sincerely

Dave Young
Manager, Land Use Development
Hunter Infrastructure Services

22 September 2010

Cc. Mr Marc Desmond
Lake Macquarie City Council

Hunter Water Corporation
ABN 46 228 513 446
Customer Enquiries 1300 657 657
enquiries@hunterwater.com.au

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300

8 September 2010 Ref: 2009-905

NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

Attn : Felicity Greenway

Dear Felicity,

RE: PART 3A ENVIRONMENTAL ASSESSMENT ADVICE – PROPOSED RECYCLING FACILITY AT LOTS 42,43,53, AND 54 DP 16062, THE WEIR ROAD TERALBA.

As requested, Hunter Water has reviewed the environmental assessment for the provision of water services to the proposed recycling facility at Lots 42, 43, 53, and 54 DP 16062, The Weir Road, Teralba.

General information on water issues relevant to the proposal is included in this correspondence. This information is based on Hunter Water's knowledge of its system performance and other potential development in the area at the present time.

As you will appreciate, there may be significant changes that occur by the time the development proceeds to the lodging of a development application, therefore this Part 3A Environmental Assessment advice is not a commitment by Hunter Water and may be subject to significant change prior to the development proceeding.

In this instance, Hunter Water's Part 3A Environmental Assessment advice is as follows:

1. Water Supply

The proposed development is located in the South Wallsend Water Supply System. The development can be serviced via the existing 150mm MSCL main located at the intersection of The Weir Rd and Racecourse Rd. The maximum RL on the development site is approximately 2m AHD.

The development site is currently remote from existing water services. The developer has proposed to connect into the existing water supply system via the extension of a 65mm service from the existing 50mm water meter to the development site. Hunter Water advises that such a connection would only be available under a Non-Standard Water Service Agreement and, as such, Hunter Water is required only to meet Peak Day Demand and Fire Flow requirements **at the point of connection to our infrastructure** (that is the existing connection at the intersection of The Weir Rd and Racecourse Road)

However, further analysis of the water system at the boundary of the proposed development site reveals that ultimate pressures provided to the development via the 65mm service would not meet minimum fire fighting standards. In order to achieve suitable fire fighting pressures at the development site, a 100mm service (minimum size capable of providing suitable pressures) is required. The 100mm service, like the proposed 65mm service, would only be available under a Non-Standard Water Service Agreement.

Alternatively, the developer may wish to construct a developer funded 100mm water main which Hunter Water will require constructed along the total frontage of the development. Hunter Water will own and carry out any future maintenance on the main and will be required to provide minimum Peak Day Demand and Fire Flow pressures to the development site.

SEWER

This site is remote from Hunter Water's sewerage system.

RECYCLED WATER

Hunter Water supports the use of recycled water where economically feasible and environmentally sound. There may be potential to supply the proposed site with recycled water from Edgeworth Waste Water Treatment Works. Hunter Water would be happy to discuss this opportunity further with the applicant.

Hunter Water has no objections to the proposed development application; however the developer should continue to liaise with Hunter Water regarding the development..

If you have any enquiries, please do not hesitate to contact Stephen Glynn on 4979 9525.

Regards,

Stephen Glynn
Account Executive Major Development
stephen.glynn@hunterwater.com.au
Tel: 02 4979 9525
Fax: 02 4979 9711

NSW GOVERNMENT | **Office of Water**

Major Development Assessments
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Contact: Jodie Dabovic
Phone: 02 4904 2571
Fax: 02 4904 2501
Email: Jodie.Dabovic@water.nsw.gov.au

6 September 2010

Our ref: MPER20018
Your ref: S07/00084

Attention: Felicity Greenway

Subject: Teralba Waste Recycling Project (08_0079) – Review of Environmental Assessment

NSW Office of Water (NOW) has reviewed the environmental assessment for the Teralba Waste Recycling projects. NOW regards the Statement of Conditions within the environmental assessment to be adequate to be incorportated into the project approval to act as the conditions of approval.

If you require further information please contact Jodie Dabovic on 4904 2571 at the Newcastle office.

Yours sincerely

Mark Mignanelli
Manager
Major Projects and Assessment
NSW Office of Water
Newcastle

All communications to be addressed to:

Headquarters
NSW Rural Fire Service
Locked Mail Bag 17
GRANVILLE NSW 2142

Telephone: (02) 8741 5555
e-mail: development.assessment@rfs.nsw.gov.au

Headquarters
NSW Rural Fire Service
15 Carter Street
Lidcombe NSW 2141

Facsimile: (02) 8741 5550

Department of Planning
Major Development Assessment
GPO Box 39
SYDNEY NSW 2001

Attention: Felicity Greenway

PCU015243

30 September 2010

Dear Ms Greenway

Teralba Waste Recycling Project - 08_0079
Exhibition of Environmental Assessment

I refer to your letter seeking comments on the Environmental Assessment from the NSW Rural Fire Service (RFS) regarding bush fire protection for the above proposal.

The RFS has reviewed the submitted plans and information and supports the bush fire protection measures contained within the bushfire protection assessment report prepared by Australian Bushfire Protection Planners, ref. BO91021 - 1, dated 21/06/2010, except where modified below.

- The construction of the proposed office building shall comply with section 7 (BAL 29) Australian Standard AS3959-2009 "Construction of buildings in bush fire-prone areas' and section A3.7 Addendum Appendix 3 of "Planning for Bush Fire Protection".

For any enquiries regarding this correspondence please contact Garth Bladwell.

Yours faithfully,

Department of Planning
Received
6 OCT 2010
Scanning Room

Corey Shackleton
A/Team Leader Development Assessment and Planning

For information on *Planning for Bush Fire Protection 2006* visit the RFS web page www.rfs.nsw.gov.au

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Hunter Regional Development Committee

C/- RTA
Locked Bag 30
NEWCASTLE NSW 2300

Phone: (02) 4924 0240
Facsimile: (02) 4924 0342

Director, Major Development Assessments
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Felicity Greenway

PROPOSED RECYCLING FACILITY– THE WEIR ROAD, TERALBA (MP 08_0079)

Dear Ms Greenway

I refer to your letters dated 26 August 2010 (Your reference: S07/00084) regarding the subject development application.

The Hunter Regional Development Committee (HRDC) considered the application under the requirements of *State Environmental Planning Policy (Infrastructure) 2007*, at its meeting on 23 September 2010.

The Committee considered a Traffic Impact Assessment prepared by AECOM dated 22 June 2010 for the proposed Recycling Facility 80 The Weir Road, Teralba.

The Committee would have **no objections** to the proposed development provided the following matters are addressed and included in Councils conditions of development consent:

1. Given the number of trucks expected to enter and exit the proposed development, a Type AUR intersection / access should be constructed at the site access in lieu of the Type BAR.

2. Provision should be made for on-road cyclists at the intersection / access.

3. The line marking / sign posting plan for the intersection / access should make provision for truck turning signs.

4. Street lighting should be provided at the intersection / access in accordance with Australian Standard AS 1158.

5. The weigh bridge should be relocated further into the site to ensure vehicles do not queue back onto The Weir Road.

6. All roads and parking areas within the site should be sealed.

7. A truck management plan should be prepared. This should include a restriction on vehicles travelling to and from the site immediately before and after school hours.

8. Further details regarding the internal operation of the site should be provided to Councils satisfaction, including how vehicles move through the site and where vehicles will park to load and unload materials.

9. The off-street car and truck parking associated with the subject development including aisle widths, parking bay dimensions, and loading / unloading bays are to be in accordance with AS 2890.1-2004 and AS 2890.2-2002.

10. All of the above should be to Council requirements.

On determination of this matter, it would be appreciated if a copy of the notice of determination could be forwarded to the RTA for record purposes.

Please contact me on (02) 4924 0240 if you require further advice.

Yours sincerely

Dave Young
Chairperson
Hunter Regional Development Committee

15 October 2010

Cc. Marc Desmond
Lake Macquarie City Council

Appendix B

Revised Statement of Commitments

Appendix B Statement of Commitments

A revised SoC for the proposed construction and operation of the proposed Facility is presented below. Changes to the SoC from the Public Exhibition version of the EA have been made to address the submissions from the DoP and include:

- Updating the bushfire commitment in relation to construction of office building and sheds to reflect the 2009 update to *AS 3959*.
- Rewriting the SoC to read 'will' instead of 'would'.
- Providing commitments in relation to energy reduction measures.
- Providing commitments in relation to the *Angophora inopina* trees impacted by the development.

Table B1: Statement of Commitments

Issue	Commitment
General	CiviLake will prepare and implement the following management plans for the Facility: • A CEMP covering: - site security and access; - site signage requirements (including contact numbers) and hours of operation; - sediment and erosion control, soil / stockpile management and stormwater management; - noise control; - air quality control (dust and odour); - hazardous materials (fuels etc) storage, use, refuelling and maintenance , emergency response etc; - measures required to be implemented for the proposed excavation works; - waste management; - traffic management ; - material tracking and documentation; - procedures for safely working in and around the electrical easement; - groundwater and acid sulphate soil management (where excavations are required); - *Imported Fill Quality Plan*; - EEC protection / landscape; - heritage (contingency in event aboriginal artefacts encountered); - *Bushfire Management Plan*; - monitoring requirements; and - contingencies.

Issue	Commitment
	• An OEMP addressing: - site security and access; - site signage requirements (including contact numbers) and hours of operation; - stockpile management; - operation, maintenance and monitoring of the stormwater management and treatment system; - noise control; - air quality (dust and odour); - hazardous materials (fuels etc) storage, use, refuelling and maintenance , emergency response etc; - imported waste quality plan (i.e. procedures to check imported wastes meet a relevant resource recovery exemption); - waste management; - traffic management ; - material tracking and documentation - procedures for safely working in and around the electrical transmission easement; - EEC protection / landscape; - heritage (contingency in event aboriginal artefacts encountered); - bushfire management plan; - monitoring requirements; and - contingencies.
Contamination	A detailed design specifying the construction/composition requirements for the capping layer will be developed.
	Fill material imported onto the site will be tested as required to meet DECCW requirements and be geotechnically suitable.
	Groundwater monitoring will be conducted to establish, with a greater level of confidence, groundwater flow direction, hydraulic conductivity and whether identified contaminated groundwater is migrating off-site.
	A contingency plan will be considered in the event that groundwater quality does not improve following the placement of the cap and/or significant contaminated groundwater is migrating off-site.
	Methane monitoring will be carried out to determine whether there is vapour generation which may pose a hazard to both the construction and future site workers.
	A Site Validation Report will be prepared following placement of the capping layer and the additional groundwater and methane monitoring, to certify that the proposed development area is suitable for use as a recycling facility.
Water Management	CiviLake will ensure that the site is designed and constructed in accordance with AECOM's *Water Cycle Management Plan*.
Flora and Fauna	A site perimeter fence (stock fence) will be installed prior to the commencement of construction works to prevent accidental intrusions into adjoining areas of natural vegetation, particularly the swamp and wetland areas.

Issue	Commitment
	Temporary fences or barriers will be installed on the development side of the surveyed edges of the EEC in the south-eastern and south-western corners of the property during construction to protect the EEC from accidental intrusions by machinery and to prevent inappropriate stockpiling of soil and building materials in the EEC areas.
	Runoff and sedimentation from the proposed works areas will be managed during the construction phase using current best practice sediment and erosion control measures.
	A protocol for the prevention of *Phytophthora cinnamomi* infection of native plants will be developed and implemented during construction.
	All species to be used for rehabilitation and restoration of retained natural areas and the embankment will be of local provenance.
	Weed control protocols will be developed and implemented. These protocols will include all weeds from areas cleared during construction being completely removed from the site and not allowed to enter adjacent habitat.
	Significant weeds will be controlled along the perimeter of the site in the area of the landscaped embankment wall and prevented from invading adjoining natural bushland.
	A tree felling protocol will be developed and implemented to minimize harm to all fauna species during the clearing of trees.
	An Offsets Management Plan will be prepared by a suitably qualified consultant and providing to DECCW for approval prior to commencement of construction and removal of the *Angophora Inopina* trees along the western site boundary.
	A licence will be obtained from DECCW for the collection and propagation of seed from DECCW prior to collection of any seed
	Following obtaining the licence, seed will be collected from mature *Angophora inopina* trees within the Teralba site by a suitable arboriculturist/horticulturist and propagation of the seed at a suitable nursery will be commenced prior to commencement of construction and removal of the *Angophora Inopina* trees
	A minimum of 91 healthy *Angophora inopina* trees will be established in a suitable offset area nearby the Site (resulting in an offset ration of 7:1 for the 13 *Angophora inopina* trees to be removed on the Site).
	Monitoring and maintenance of the *Angophora inopina* offset area will be undertaken in accordance with the approved Offsets Management Plan.
	The *Angophora inopina* offset area would be formally protected in perpetuity by a suitable legal mechanism, likely to be a S88B-E Covenant on the title of the land.
Heritage	Should any objects be identified during the course of site works, all works must cease and the DECCW (Hunter Branch, Environment Protection and Regulation Division, Regional Archaeologist) be contacted in regard to appropriate permit requirements.
	Should suspected skeletal material be uncovered during the course of site works, all works must cease and the DECCW, the NSW Police and the NSW Coroner's office be contacted immediately, regardless of any existing DECCW permits for the proposed development.
	All contractors who work within the confines of the study area should be made aware of the *NPW Act 1974* (as amended) and the fact that it is an offence to move, disturb or destroy Aboriginal objects without the prior written permission of the Director General of the DECCW.

Issue	Commitment
Bushfire	A minimum 20m wide defendable space [building setback] will be provided between the bushfire hazard and the building. The defendable space will be maintained as an Inner Protection Area in accordance with the specifications of Appendix A2.5 of *Planning for Bushfire Protection 2006.*
	Management of the defendable spaces/landscaped areas within the development site will comply with the following: • a clear area of low cut lawn or pavement adjacent to the building will be maintained; • areas under shrubs and trees will be raked and clear of combustible fuels; • non-flammable materials such as Scoria, pebbles and recycled crushed bricks will where possible be used as ground cover in close proximity to building; and • trees and shrubs will be maintained in such a manner that tree canopies are separated by 2m and understorey vegetation is not continuous (retained as clumps).
	The storage sheds will be constructed to comply with BAL12.5 specifications as defined by *A.S. 3959 – 2009 – Construction of Buildings in Bushfire Prone Areas* except for those elevations which are exposed to the bushfire hazard. Elevations of the storage sheds which are exposed to bushfire hazard will be constructed to comply with BAL29 specifications as defined by *A.S. 3959 – 2009 – Construction of Buildings in Bushfire Prone Areas.* The office building will be constructed to comply with BAL29 specifications as defined by *A.S. 3959 – 2009 – Construction of Buildings in Bushfire Prone Areas* and section A3.7 Addendum Appendix 3 of "Planning for Bush Fire Protection".
	The following additional construction standards will be implemented: • the roof gutters will be fitted with a non-combustible leaf/gutter guard; • access doors [pedestrian and vehicle] to the Storage Sheds will be fitted with weather seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention will be paid to the gap at the head of the door curtain; • any external vents or grilles will have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers through the opening; • ventilation louvres will be screened with stainless steel flymesh with a maximum aperture of 2mm; • roof ventilators will be fitted with stainless steel flymesh to prevent the entry of embers into the building; and • external doors to the south-western elevation will be protected against the entry of embers – threshold, stile and head seals will be fitted to doors.
	Water storage tanks will feed a pump which supplies fire hose reels fitted to the exterior of the office and storage shed buildings. The number of hose reels will be determined so that all points of the exterior of the buildings are covered by a 30m hose line length and the water stream from the end of the hose.
	CiviLake will undertake a 'risk assessment' which identifies the external and internal threats to the facility. From this risk assessment an '*Operations/Emergency Procedures Manual'* will be prepared which identifies operational/emergency procedures required in order to address the management of the identified risk.
	An *Emergency Response and Evacuation Plan* will be prepared for the Facility and included in the OEMP. The evacuation plan will address the protocols for the timely relocation of staff/visitors in the event that an emergency occurs, both within the site or within the local area.

Issue	Commitment
Hazard and Risk	CiviLake will install spill kits in the storage shed and train personnel at the site in spill cleanup procedures and use of the spill kits at the site.
	A dry powder fire extinguisher will be installed in the shed. Personnel at the site will be trained in the use of first attack fire fighting.
	A procedure for the refuelling of mobile plant (e.g. front end loaders, crushers, screens, etc.) will be developed and refuelling operations will be performed no closer than 12m to the site boundary.
	Crushers and shredders, etc. will be located no closer than 25 m to the site boundary.
Visual	CiviLake will ensure that the site is landscaped and rehabilitated in accordance with the *Landscape Management Plan* prepared by AECOM 2010.
Air Quality	Excavation/fill works will only be undertaken during periods of low wind speed. Exposed areas will be stabilised as soon as possible to minimise dust generation. Water sprays will be used on unsealed areas and stockpiles.
	The OEMP will include measures such as: • Use of water sprays for: - all processing activities; and - on all exposed stockpiles as required. • Reduced operation during windy conditions; • Covering of vehicles with potentially dusty loads before leaving the site; • Installation of a wheel wash for vehicles travelling onto and off-site; • Use of water carts on unsealed areas when required; and • Maintenance of the vegetated perimeter berms to serve as a barrier to dust emissions leaving the site. Reversing alarms or audible warning devices on loaders and other equipment will be of broadband type and have levels that do not to exceed 85 dB(A) when measured at a distance of 7m directly behind the rear of the equipment (Fit BBS-TEK Alarms - Medium and Light Duty Model 600-BBS087 or equivalent).
Noise	Sound attenuation barriers (which could potentially be formed by stockpiles) around the crusher and tub grinder will be constructed to have a minimum crest height that is 3m above the finished ground level. The design and location of the barriers will be at the direction of a suitably qualified acoustics consultant and be coordinated with the operational requirements of the proposed Facility.
	Sound power levels of the proposed plant will be verified by an appropriately qualified acoustic consultant after commissioning.
Waste	CiviLake will develop a *Waste Management Plan* to be included in the CEMP and OEMP for the proposed Facility detailing the means by which CiviLake will manage recyclable and waste materials at the site.
Infrastructure and Utilities	A Section 50 Compliance Certificate will be obtained from Hunter Water following installation of the water service connecting to the Hunter Water Main. Energy Australia will be consulted during preparation of the CEMP and OEMP with respect to work within the electrical transmission easement. Energy Australia approval will be obtained on the Level 3 Power Design. A minimum of 50,000L of fire fighting supply water will be provided in above ground water storage tanks on the site.

Issue	Commitment
Greenhouse Gas / Energy Reduction	CiviLake will initially install a minimum 3kV photovoltaic system on the shed roof and progressively expand this system to around 15kw total capacity over a 10 year period. CiviLake will install a solar hot water / storage system in the form of roof topped solar panels and a ground or roof mounted tank at the admin building. The system will likely require an electric boost as most systems do in winter.

Appendix C

Traffic Noise Assessment

6 December 2010

AECOM PTY LTD
Q410, QVB Post Office,
Sydney, NSW, 1230.

Our Ref 8272-201.2 - Traffic Noise Update

Attn Joshua Lasky

Traffic Noise Impact Assessment for Proposed Teralba Sustainable Resource Centre

Introduction

Civilake has submitted an Environmental Assessment (EA) for a proposed Sustainable Resource Centre to be located on The Weir Road at Teralba. The Department of Planning (DoP)has requested that further traffic noise impact assessment be conducted for residences on The Weir Road and Northville Drive, and at the Barnsley Public School. The Department has also sought clarification as to the existing noise levels at York Street Teralba.

In response to the DoP request a traffic noise impact assessment has been conducted for the locations requested by the DoP and also at 29 York Street. To perform the assessment traffic noise monitoring was conducted at four representative locations during the afternoon traffic peak on the 16th of November 2010 and during the morning traffic peak on the 17th of November 2010. The four locations are shown in Figures 1 and 2 below and represent the sensitive receivers that may experience changes to the traffic noise conditions as a result of the development of the proposed Sustainable Resource Centre.

Method of Assessment

The traffic noise assessment has been conducted by measuring the existing sound levels at the nominated locations and then using the measured sound levels to calibrate a CORTN noise model for each site. The calibrated model was then used to determine the likely change in traffic noise levels at each location that may result from changes in traffic volumes due to the operation of the proposed development. The traffic flows used in the assessment are those from the Traffic Impact Assessment Report prepared by AECOM dated 22nd of June 2010.

Traffic noise was measured using attended sound level loggers that were set up at the front boundary of each of the monitoring sites and the traffic noise levels were logged as 15 minute L_{Aeq} values, as recommended by the NSW DECCW Environmental Criteria for Road Traffic Noise (ECRTN). The recorded 15 min equivalent continuous sound levels were logarithmically combined to give a 1 hour L_{Aeq} ($L_{Aeq\ 1hr}$) value for each peak traffic period. The highest measured $L_{Aeq\ 1hr}$ level for the peak traffic flows was then used to compare with the traffic noise criteria in the ECRTN to determine the likely traffic noise impact at each assessment location.

The sound monitors (with the exception of 29 York Street) were set up under free field conditions at the boundary of the premises that were monitored. In order to be able to compare the measured levels with the traffic noise criteria from the ECRTN, appropriate distance attenuation has been subtracted from the measured levels to determine the noise level at the building facade and a facade correction factor has been added to the measured levels.

The ECTRN requires that assessment of the noise impact on the Barnsley Public School be conducted by assessing the noise levels from traffic within the class rooms against the sound levels for classrooms set out in Table 1 of AS NZS 2107-2000 Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors.

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Web www.rca.com.au

Monitoring at Teralba

The selected monitoring points at Teralba were number 29 York Street and number 53 York Street.

Number 53 York Street is located between Short Street, which is used to access Rhonda Road via Railway Street, and Toronto Road and so receives noise from south bound traffic from the existing quarry on Rhonda Road. Number 29 York Street is exposed to a lesser level of heavy vehicle traffic since north bound traffic from the quarry departs via Rhonda Road to Wakefield Road then to Barnsley joining Northville Drive at Appletree Road. Our observations during the survey showed that a significant component (about 50%) of northbound heavy traffic on York Street does not travel via Short Street to Rhonda Road but continues north to Racecourse Road. The two sites were selected to establish if there was any difference in the noise impacts as a result of the split of the heavy vehicle traffic flow.

Based on the traffic report by AECOM the noise monitoring site at 29 York Street is considered representative of the residence at or near 180 The Weir Road as it has very similar traffic flows with similar percentage of heavy vehicles and similar traffic speeds.

Figure 1 Traffic Noise Monitoring Points at York Street Teralba

Noise Monitoring Locations

A number of the residences on the southern end of York Street are older and have small set backs from the road. The older residences in the area have a total distance from the edge of the carriageway to the dwelling facade of 6 meters. The noise monitor was placed 6 meters from the carriageway and is directly representative of the older dwellings in Teralba township proper. Dwellings in the northern part of York Street have larger setbacks ranging from 8 metres to 25 metres, therefore, the measured sound levels have been adjusted in accordance with the CORTN model for the sound attenuation due to the increased distance from the road.

Traffic Noise Monitoring at Barnsley

The selected monitoring points at Barnsley are a point on the boundary of the Barnsley Public School which had a direct line of sight from the logger location to the nearest classroom. The best available monitoring location was 60 meters from the nearest class room and 6 metres from the carriageway. The class room that is closest to the road is 45 meters from the edge of the carriageway and so distance adjustments in accordance with CORTN were applied to determine the sound level from traffic level at the worst affected classroom.

A second location for monitoring was chosen at number 39 Northville Drive a distance of 6 metres from the carriageway. Dwellings along Northville Drive have setbacks that give a distance between the carriageway and the facade of 10 metres and so distance attenuation adjustments have also been applied for these dwellings.

Figure 2 Traffic Noise Monitoring Points at Barnsley

- *Noise Monitoring Locations*

Traffic Noise Monitoring Results.

The measured traffic noise levels at each monitoring location are presented in the tables below.

Location	**Measured Average Hourly L_{Aeq} 7am - 9am**	**Measured Average Hourly L_{Aeq} 3pm - 5:30pm**	**Facade correction +2.5**	**Distance Correction**	**Existing Facade Noise Level PM**	**Average Peak Internal Sound Pressure Level**
	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$			dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$
29 York Street	62	64	N/A	-0.7 (15 metres)	63	N/A
53 York Street	64	66	66.5	+0	66.5	N/A
39 Northville Drive	66	66	68.5	-1.5 (10 metres)	67	N/A
Barnsley Public School	62	64	66.5	-7.1 (45 metres)	59.4	40 dB(A)

Predicted Changes to Existing Noise Levels as a Result of the Proposed Development.

Location	AM Peak Hourly Traffic 2009 L_{Aeq} 7am - 9am	AM Peak Hourly Traffic 2022 L_{Aeq} 2022 7am - 9am Without proposed Development	AM Peak Hourly Traffic 2022 L_{Aeq} 2022 With Proposed Development	Facade Noise Level for AM Peak Hourly Traffic Existing	Predicted Facade Noise Level for AM Peak Hourly Traffic Existing	Predicted Facade Noise Level for Peak Hourly Traffic in 2022 Without Proposed Development	Predicted Facade Noise Level for Peak Hourly Traffic in 2022 With Proposed Development	DECCW ECRTN Criteria	Predicted Change due to development
	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$	dB(A) $L_{eq\ 1hr}$
180 The Weir Road	135 14% HV	152 14%HV	174 22% HV	NM	61	62	63.6	60	+1.6
29 York Street	146 16% HV	164 13% HV	186 20% HV	63	62	62	64	60	+2.0 dB(A)
53 York Street	342 20% HV	385 20 % HV	408 23% HV	66.5	67.5	68.8	69.2	60	+0.4 dB(A)
39 Northville Drive	478 10% HV	551 10% HV	557 10% HV	67	68	69	69	60	+1 dB(A)
Barnsley Public School	181 8% HV	198 9% HV	218 11% HV	59.4	59	60	60.5	60	+1.5 dB(A)

Note Traffic volumes from Traffic Assessment (AECOM 2010)
HV = Heavy Vehicle Percentage - NM = Not Measured

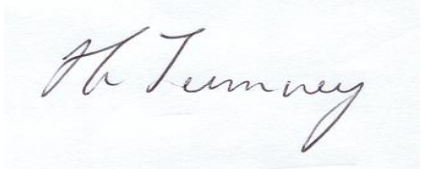
Discussion

The predicted received traffic noise levels for the existing conditions are in good agreement with traffic noise levels measured at the various locations on the 16th and 17th of November 2010 and I am satisfied that the traffic noise modelling is representative of the facade noise levels at the various locations.

The predictions have been carried out only for the AM peak traffic because only the AM peak traffic flows were available in the Traffic Assessment (AECOM 2010) and although the PM peak traffic noise levels are slightly higher than the AM peaks most of the traffic associated with the development will occur in the mornings. There is no reason to believe that a larger increase in noise levels is likely in the PM peak than that predicted to occur in the AM peak.

The predicted noise levels for 2022 show increases in traffic noise due to the development of between 0.4 and 2.0 dB(A) which is within the increases allowed under the DECC ERCTN criteria and any increase in traffic noise levels as a result of the proposed development is not likely to be detectable by residents exposed to the traffic noise from the roadway.

Yours Sincerely
Hunter Acoustics



Ray Tumney BEng (Mech), MEnv Stud, MIEAust, MAAS.
Principal Acoustic Engineer

Appendix D

Data and Assumptions used in MUSIC Modelling

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Teralba Sustainable Resource Centre MP08-0079_Response to DECCW Environmental Assessment Adequacy Review– MUSIC Modelling Parameters

MODELLING OF TREATMENT SYSTEMS FOR SITE RUNOFF AND WATER BALANCE

1) MUSIC modelling of treatment performance

The key elements of the water management treatment train have been modelled using MUSIC v4 (Model for Urban Stormwater Improvement Conceptualisation). These elements include:

- drainage swale to sedimentation pond,
- sedimentation pond,
- bioretention system,
- bypass swale,
- storage pond,
- on-site water reuse.

The initial sediment control (siltation fences/buffer strips around stock piles) and the bioretention inlet sedimentation zone and flow distribution swale have not been modelled but will provide additional water quality improvement. Details of the important modelling parameters and design levels are noted below. Further discussion in relation to the modelling can be provided if required. A graphical representation of the MUSIC model is also provided in the figure below.

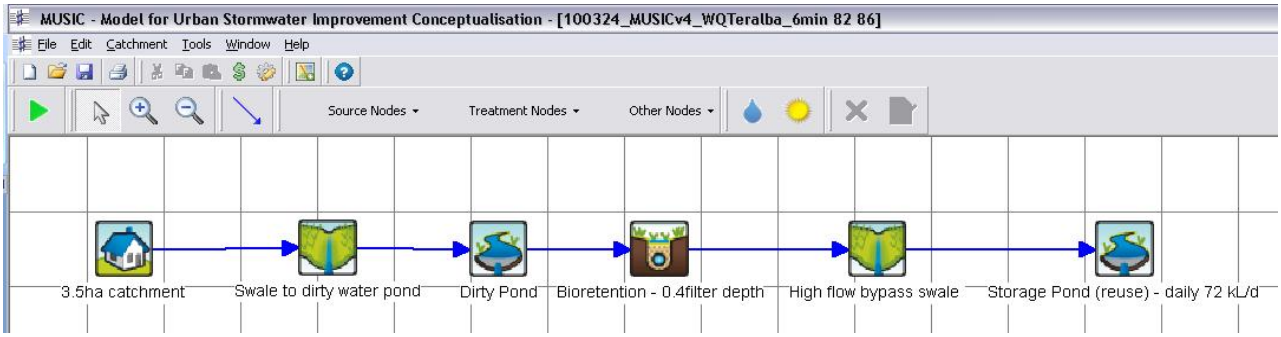

Figure - graphical representation of the MUSIC model used for water treatment modelling

- Time Series
  - A 5 year time series (1982 – 1986), Sydney coastal data (Observatory Hill), 1278 mm/yr, has been used. The results have been also validated with a 30 year time series from the same rainfall station. This station is used as it has 6 minute data available (which is not available for stations close to the site). The average annual rainfall is comparable, noting nearby BOM stations have mean annual rainfall of:
  - 1132 mm/yr (EDGEWORTH WWTP 61393),
  - 1081 mm/yr (BOLTON POINT (THE RIDGE WAY) 61133),
  - 1167mm/yr (TORONTO WWTP 61322),
  - 1254mm/yr (SWANSEA (CATHERINE ST) 61377)

- Catchment
  - 3.5ha, 100% impervious site, 3mm rainfall threshold.
  - Modelled catchment TSS pollutant profile (average TSS storm concentration) increased by an order of magnitude (from 150 mg/L to 1500 mg/L). This would give TSS loads equivalent to construction sites with exposed soil surfaces.

- Swale directing flow to dirty water pond (sediment deposition pond)
  - 300m length,
  - 0.5% grade,

- 1m top width,
- 0m base width,
- 0.15m depth and
- 0.15m vegetation height

- Dirty Water Pond (sediment deposition pond)
  - footprint 1,000m^2
  - 3.5 top weir and RL for bypass swale
  - 3.25 weir level RL
  - 2.81 inv pipe RL in pit
  - 1.8 base pond RL
  - 0.25 Ext det depth (slot / weir crest to RL for bypass swale)
  - 1,000 m^3 perm pool vol
  - 0.255 m^3/s flow over weir for 0.25m depth, then bypass via swale
  - 250m^3 ED vol
  - 980 s 16 mins det time at Qpeak
  - 468mm Equiv pipe diameter
  - 0.272 hr (20 min) notional detention time
  - 20m overflow weir (ensure unrestricted overflow to approx 4.3m width bypass channel)

- Bypass swale directing high flow from the dirty water pond to the water storage pond
  - Low flow bypass 0.255 m^3/s
  - 150m length,
  - 0.5% grade,
  - 1.3m base width,
  - 4.3m top width,
  - 0.5m depth and
  - 0.3 m vegetation height
  - 0 exfiltration rate

- Bioretention System(SZ)
  - Bioretention filter media surface area 750m^2
  - Basin footprint 800 m^2 (including bio and energy dissipation forebay and adjacent sloped area)
  - High flow bypass 0.255 m^3/s
  - Surface at RL 2.7
  - 0.3m extended detention depth
  - 0.4m filter depth (0.4 media, 0.15 transition), then saturated zone beneath RL 2.15 (Note RL of pond outlet at 2.1)
  - 100mm/hr sat hyd cond
  - Submerged zone depth 0.6m (includes drainage layer)
  - Qpeak for 0.3 ED, 0.55 filter media depth, 32 L/s
  - Unlined filter media perimeter 1m (nominal)
  - Overflow weir 20m (nominal – unrestricted bypass)
  - Exfiltration rate 0 mm/hr
  - 800 mg/kg TN content of filter media

- Water Storage Pond
  - Surface area 6,300m^2
  - 2m extended detention depth
  - 3,500m^3 permanent pool vol *note 1ML additional storage in two smaller “clean water ponds”
  - 4.1 m RL spillway / weir level
  - 2.1 m RL inv pipe outlet
  - 20m weir outlet / spillway
  - 300mm Equiv pipe diameter
  - Notional detention time is 11.8hr

- 1.1 min base pond RL
- Reuse 72 kL/d daily demand

A refined model included rainfall on the treatment area and confirmed the results of this modelling.

2) **MUSIC modelling of for the Water Balance**

Modelling undertaken for the water balance was undertaken as described above but included the surface areas of the sediment pond, the bioretention system and the water storage pond. These additional surface areas were modelled as source nodes of 100% imperviousness. These areas were included only in the water balance because in practice they would not generate pollutants but would contribute a catchment area that receives rainfall. A graphical representation of the MUSIC model is also provided in the figure below.

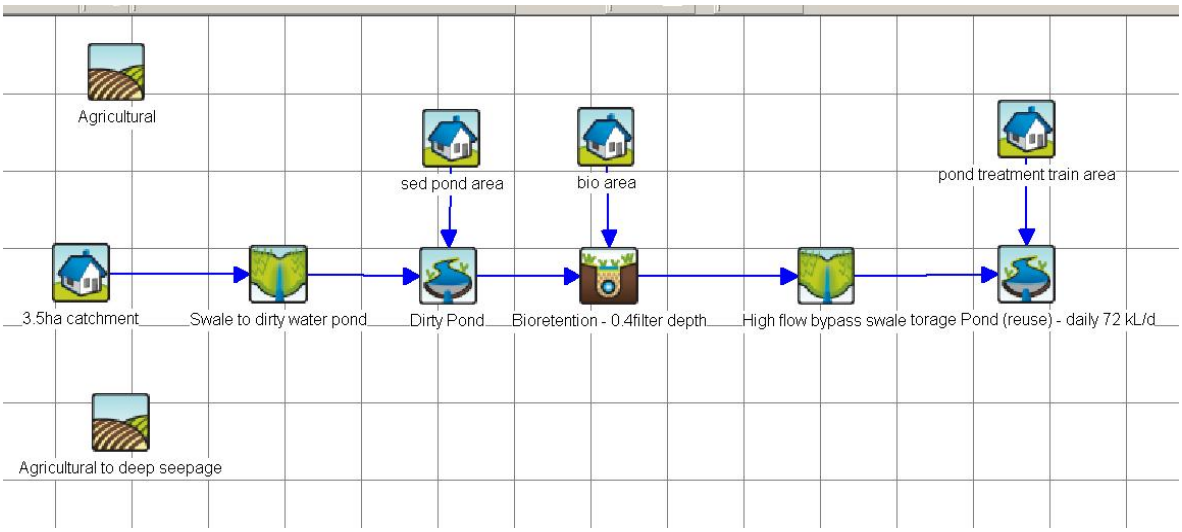

Figure - graphical representation of the MUSIC model used for the water balance

Appendix E

Assessment of Hydrological Impacts of Development on Receiving Environments

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19 Janaury 2010

CiviLake
126-138 Main Road
Speers Point NSW 2284
Attention: Martin Boyle

Dear Martin

Sustainable Resource Centre, Teralba – An Assessment of the Hydrological Impacts of Site Development on the Receiving Environments

1.0 Aim

This letter presents an assessment of potential hydrological impacts of the development of the proposed Teralba Sustainable Resource Centre on the nearby receiving environments.

2.0 Introduction

The Environmental Assessment ,"*Environmental Assessment: Teralba Sustainable Resource Centre*" (EA) prepared by AECOM for CiviLake and submitted to the Department of Planning (DoP) for approval in July 2010, assessed the likely impacts of the development of the site on the water quality and hydrology of water discharged from the site. In particular, Appendix F of the EA provided a Water Cycle Management Plan (WCMP), which provided a strategy for the treatment of site runoff to ensure that water discharged from the site would not be compromised in quality, nor substantially alter the existing hydrology.

The WCMP concluded that the modelled changes in hydrology from the site post development are expected to be within the tolerance limits of the receiving environment. However, the WCMP conservatively recommended that design work during the Operational Environmental Management Plan (OEMP) should further refine the management of water and the discharge of runoff to minimise any changes resulting from the proposed development on the hydrology of the site. This was based on the assumption that the downstream wetland would potentially be sensitive to changes in hydrology. This wetland has been identified by the NSW DoP as being subject to the State Environmental Planning Policy No. 14 – Coastal Wetlands (SEPP 14).

The SEPP 14 wetlands identified by the DoP comprise several Endangered Ecological Communities (EEC) as defined by the Threatened Species Conservation (TSC) Act 1995, namely (refer Figure 1):

- Freshwater Wetlands EEC
- Ball Honeymyrtle Swamp Forest EEC
- Swamp Mahogany / Paperbark / Wollybutt Swamp Forest EEC

The Freshwater Wetlands EEC occurs in one discrete location, in a shallow depression to the south east of the site. This EEC was considered by Ecotone (2008) to form the 'core' part of the SEPP 14 wetland. The wetland is highly disturbed by past grazing and has been subject to slashing. This Freshwater Wetland EEC is the community most susceptible to changes in hydrology as this occurs in and adjacent to the channel that receives runoff from the site. The other EECs occur on higher ground away from the channel and are unlikely to be inundated by flows from the development site.

Note that the SEPP 14 wetland extends south of Weir Road to the water's edge of the downstream lake. Most of the vegetation within the mapped SEPP14 Wetlands boundary that occurs south of The Weir Road is not connected to the drainage channel. Therefore, south of The Weir Road, only a narrow strip of vegetation growing within the channel would be subjected to runoff from the development site.

A site visit was conducted to assess the requirements for mitigating potential impacts that could result from changes in hydrology. The following process was followed during the site visit:

- Identify the receiving environments likely to be impacted by runoff from the site
- Assess potential impacts resulting from changes in water quality or hydrology
- Refine recommendations for the detailed design of the site to ensure that impacts can be adequately mitigated.

3.0 Site Visit

A site visit was undertaken by AECOM staff, namely:

- Dr Peter Breen – Lead Ecologist
- Dr Courtney Henderson – Project Ecologist
- Emma James – Ecological Engineer

Dr Peter Breen (present at the site visit) is a leading wetland ecologist specialising in the impacts of development on aquatic ecosystems including wetlands.

The site visit investigated:

- The perimeter of the proposed development
- The existing drainage path from the site, through the SEPP 14 Wetlands, to a lake south of The Weir Road, and finally to Cockle Creek.

At each of these locations the drainage flow paths and nature and health of plant communities were observed and the likely current and future inundation regimes assessed.

4.0 Results of Site Assessment

4.1 Flow path

Based on the site visit it was determined that runoff from the Site follows the following flow path from the point of discharge (refer also to diagram below):

1) **Drainage Ditches** - Runoff from the site is currently collected in drainage ditches that extend along the eastern, northern and western perimeters of the site.
2) **Culvert** - These ditches discharge to a culvert that passes south to north under the road reserve near the north-eastern corner of the site.
3) **Channel** - The culvert under the road reserve discharges to a channel that crosses back under the road reserve north to south and flows south-east towards the SEPP14 Wetlands.
4) **The SEPP 14 Wetlands**. The SEPP14 Wetlands consists of several vegetation communities. The community with the most potential to be impacted is the Freshwater Wetlands EEC that occurs around a shallow depression to the south-east of the site. It is ephemerally wet and connected to a lake downstream of Weir Road by a channel and culvert. This community qualifies as Freshwater Wetlands EEC under the NSW TSC Act.
5) **Culvert** – The culvert allows water from the SEPP14 Wetlands to flow to and from the downstream lake.
6) **Lake** – The lake is connected to Cockle Creek via a culvert.
7) **Culvert** – The culvert to Cockle Creek is low enough to allow tidal flows to back up into the lake.
8) **Cockle Creek and then Lake Macquarie**– are the final receiving aquatic environments.

Figure 1 **Plan showing the proposed flow paths environments assessed during the site visit**

Legend:

1. *Drainage Ditches*
2. *Culvert*
3. *Channel*
4. *Freshwater Wetlands EEC*
5. *Culvert*
6. *Lake*
7. *Culvert*
8. *Cockle Creek*

N. Drainage Ditch

W Drainage Ditch

S. Site Access

D. Area of Impeded Drainage

4.2 Condition of downstream environments

The site and the drainage flow paths downstream from the site are in highly disturbed or modified states. The site itself sits above the natural surface level and is colonized by weedy pasture grasses. The channel downstream of the site is artificial and heavily infested by weeds. Further downstream, the Freshwater Wetlands EEC is colonised by exotic pasture grasses and has been impacted by cattle grazing (Ecotone letter November 2010). Furthermore, the low lying areas of the Freshwater Wetlands EEC are also impacted by saline water, presumably due to the intrusion of tidal saline water from Cockle Creek via the large lake South of The Weir Road. The catchment of the Freshwater Wetlands EEC is difficult to determine due to the flat nature of the topography and numerous depressions and flow paths in the area, however the site is estimated to comprise less than 20% of the catchment that sheds water to the Freshwater Wetlands EEC.

The condition of individual elements of the downstream environments along the flow path is discussed as follows:

1 Drains. The existing drainage ditches on site are colonised by introduced pasture grass species (Ecotone 2010)

Figure 2 Drainage ditch along the site's northern boundary. Note the dominance of pasture grasses and Blackberry.

2. Culverts. The culverts collect water from the site and discharge to weedy environments.

Figure 3 Culvert near north western corner of site that collects runoff from site drainage ditches and directs flow under the road reserve. Note the dominance of pasture grasses on the banks and growing into the ditch.

Figure 4 Second culvert downstream of the north western corner of site that directs runoff into the channel (flows from left to right). Note the dominance of pasture grasses on the banks and Lantana growing in the channel.

3. Channel. The channel is heavily colonized by weedy species such as Lantana and introduced pasture grasses, and choked by Typha in parts. Water in the channel appears to be fresh.

Figure 5 Channel downstream of the road reserve. Heavily colonized by weedy species such as Lantana, and choked by Typha (looking downstream).

Figure 6 The channel looking upstream of where it discharges to the Freshwater Wetlands EEC. The water is fresh at this location (note green grasses growing in the channel).

Figure 7 Informal crossing in electricity easement looking downstream towards the Freshwater Wetlands EEC. Note that grasses in the channel upstream of the culverts are green, whereas grasses downstream of the culverts are brown where they may have been killed by salt water intrusion. The obstruction across the easement created by the culverts probably limits the extent of saltwater intrusion.

4. Freshwater Wetlands EEC. A Freshwater Wetlands EEC (previously reported as a freshwater ecosystem) occurs downstream of the channel at the transmission easement. There is significant evidence that the low lying areas of this community are tidal, likely as a result of altering culverts downstream that has allowed water to enter from the tidal Cockle Creek. The intrusion of salt water has killed vegetation in the low lying areas of the freshwater wetland vegetation. The impact appeared limited to the inundated low lying areas as higher surrounding areas of other EECs populated by *Melaleuca* trees were not impacted.

Figure 8 Grasses in the low lying areas of this channel are brown and dead or dying. Yet just upstream of the informal road crossing (behind the photographer), the same grasses in similar states of inundation are green. It appears likely that these plants were killed by salt water.

Figure 9 Low lying and inundated areas of the Freshwater Wetland EEC had vegetation that was dead or dying. It appears likely that these plants were killed by the intrusion of salt water from the lake downstream.

Figure 10 *Cotula coronopifolia* growing amongst the dead vegetation of the freshwater wetland. The growth of *Cotula* is sometimes an indicator of brackish waters or saline soils.

Figure 11 Atriplex prostrata (Salt bush) growing amongst the dead vegetation of the freshwater wetland. *Atriplex* is a saltmarsh plant and an indicator of brackish waters or saline soils.

Figure 12 Green algae (considered to be *Enteromorpha*) was common throughout the inundated area of the freshwater wetlands. This alga is restricted to brackish or saline waters. A further indication of saltwater intrusion moving from downstream into the wetlands

5. Culvert. A culvert controls flows between the Freshwater Wetlands EEC and the lake downstream of Weir Road. It is probable that this culvert is sufficiently low to allow tidal flows that pass from Cockle Creek to the lake, to progress further upstream and into the Freshwater Wetlands EEC. This culvert controls water levels in the depression where the Freshwater Wetlands EEC occurs. The culvert connection ensures that if the Freshwater Wetlands EEC is exposed to additional runoff, although the frequency and duration of inundation will increase, the depth of inundation is not likely to increase. This culvert connection directs flows to the lake downstream. The presence of a channel along the length of this connection isolates site runoff from the SEPP14 wetland communities that grow either side of the channel.

Figure 13 Culvert connection from SEPP 14 Freshwater Wetlands EEC to the lake south of Weir Road.

6. Lake. The lake downstream of the Weir Road appears to have been impacted by the intrusion of saline water. The trunks of dead trees appear to be trunks of *Melaleuca spp*. *Melaleuca spp*. are only sparingly tolerant of inundation by saline water, indicating that this lake probably contained freshwater in the past but that tidal flows now dominate the hydrology. Salt marsh plants and mangroves have become established at the foot of the dead tree trunks. These plants occur in tidal, saline environments.

Figure 14 Existing trees trunks that appear to be dead *Melaleuca* trees.

Figure 15 The mangrove *Avicennia marina*, and the salt marsh plant *Sarcocornia quinqueflora* (Samphire) growing at the foot of the dead *Melaleuca* tree trunks. Mangroves and Samphire occur in tidal, saline environments.

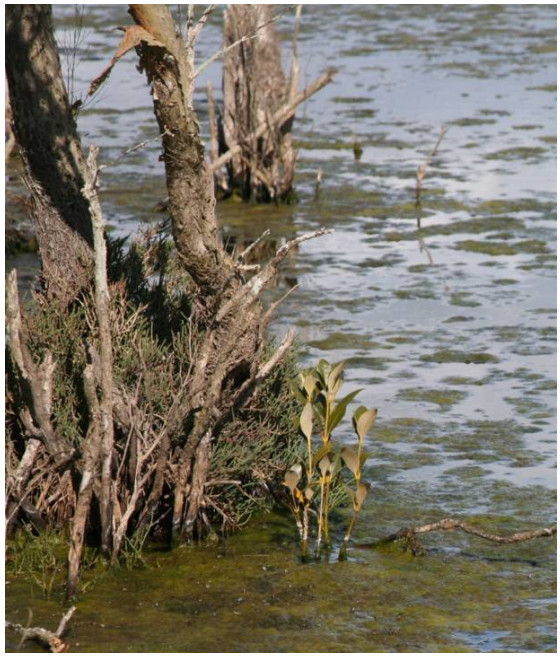

Figure 16 Dead *Melaleuca* trees to the right, a more salt-tolerant species, *Casuarina,* persisting on the left with salt marsh plants growing at its base. The water surrounding the trees is abundant with the brackish-preferring algae *Enteromorpha*.

7. Culvert. A culvert downstream of the lake provides a tidal connection from Cockle Creek to the lake.

Figure 17 The Culvert that connects the lake to Cockle Creek (looking downstream)

Figure 18 Looking upstream from the culvert to Cockle Creek. Note the occurrence of mangroves on the far bank of the channel indicating the tidal hydrology of the channel.

4.3 Survey of culvert connections

At AECOM's request, CiviLake undertook a survey of the invert levels of the culvert between the Freshwater Wetlands EEC and the lake, and the lake and Cockle Creek. The reduced levels (RLs) at these culverts were surveyed relative to the Australian Height Datum (AHD). The RLs were compared to the tidal data (also AHD) from Manly Hydraulics Laboratory for the Cockle Creek Railway Station for the years 1988 to 2000. The Cockle Creek Railway Station is adjacent to the culvert connecting the lake and Cockle Creek and therefore monitored water levels at this location are considered appropriate for assessing whether water from Cockle Creek will flow through the culverts into the lake and eventually the Freshwater Wetlands EEC.

Water level data for Cockle Creek Railway Station tide monitoring location indicates that the mean surface level at the monitoring station varied between 0.007m AHD and 0.106 m AHD between 1988 and 2000. The mean tidal range is approximately 0.064 mAHD. Over the monitoring period, the highest mean high water level was 0.151 mAHD, and the lowest mean low water level was – 0.033 mAHD.

The surveyed RLs of the inverts of the culverts were as follows:

- Culvert from Cockle Creek to lake (Figure 17): -0.154mAHD
- Culvert from lake to Freshwater Wetland EEC (Figure 13): -0.70 mAHD
- Culvert from Freshwater Wetland EEC to drainage near the transmission easement (Figure 7): 0.153mAHD

Based on the survey and water level data, the connection from Cockle Creek to the lake is probably permanent, thus explaining the saline condition of this lake. Further, the culverts under The Weir Road are set lower, thus ensuring a connection between the lake (and hence Cockle Creek) up to the Freshwater Wetlands. The limit of salt water intrusion is most likely the culvert under the informal road that crosses the drainage channel at the transmission easement, as this is set higher than the highest mean high water for the monitoring period. The extent of the Freshwater Wetlands EEC was not surveyed, but our visual inspection revealed that some parts of this community are impacted by saline water, while other higher areas remain un-impacted.

4.4 Condition of adjacent upstream environments

The environments upstream of and adjacent to the site were assessed to determine if the development of the site would have an impact on the hydrology of these areas.

Along the perimeter of the northern and western boundaries of the site, a drainage ditch drains the local environs, and maintains the hydrology of the adjacent swamp forests within the tolerance limits of the vegetation that grows there.

Figure 19 **Ditch draining the western perimeter of the site. This ditch drains the area adjacent to the bund and maintains sufficient dryness in the site hydrology to allow the persistence of the adjacent swamp forests immediately to the left.**

5.0 Potential Impacts of Site Development on Surrounding Environments

The potential impacts of the development of the site were considered in light of the site assessment and AECOM's understanding of the hydrological and ecological requirements of the surrounding environments that were investigated. The development of the site has the potential to impact downstream environments by altering the hydrology of runoff from the site including an increase in estimated discharge of surface runoff from the site from 8 to 11 ML. The development of the site also has the potential to impact surrounding environments by impeding runoff from the upstream catchment.

5.1 Potential impacts on downstream environments resulting from site runoff

Runoff from the proposed development is considered unlikely to cause any significant impacts on the receiving environment. This is due to the following site conditions:

- The existing channel (depicted as number 3 in Figure 1) has the capacity to accommodate any increase in flow volume. The channel downstream is highly degraded (modified and weedy but stable). This channel keeps site runoff from entering the surrounding environment.
- The low lying areas of the Freshwater Wetlands EEC, which the site runoff currently and is proposed to continue to flow through, are a community of marsh-type plant species that are pre-adapted to wet conditions and inundation. This community is naturally flooded or dried out in wetter or drier years and the growth of plants in this community constantly evolves in response to changes in hydrology. Therefore, this community is able to adapt to the additional frequency and duration of flooding.
- The low lying areas of the Freshwater Wetlands EEC, to which the site runoff currently and is proposed to continue to flow through, are tidal / brackish.
- The impact of the potential increase in runoff from the site post development on the Freshwater Wetlands EEC is considered to be much less than the impact of saline tidal inundation.
- The water levels in the Freshwater Wetlands EEC are controlled by the culvert under Weir Road. Therefore, increases in runoff from the site are not likely to increase the depth of inundation since the culvert provides adequate conveyance. Increases in runoff will only increase the frequency and duration of inundation.

Advice from Ecotone indicates that the expected increase in runoff would be within the tolerance limits of the vegetation that currently occurs on site, and site runoff may benefit the vegetation by diluting the salinity of the water.

- The lake south of Weir Road is also tidal / brackish. The lake ecosystem is predominantly influenced by the tidal hydrology. The vegetation growing in the littoral zone was typical of plants that grow on the banks of tidal rivers and lakes.

5.2 Potential impacts on upstream or adjacent environments - bunds impeding flow from upstream catchments

Along the perimeter of the northern and western boundaries of the site, a drainage ditch drains the local environs, and maintains the hydrology of the adjacent swamp forests within the tolerance limits of the vegetation that grows there. The northern portion of the ditch is to be retained however the western portion of the ditch is proposed to be filled over to construct the perimeter bund. A drainage ditch would be reinstated along the western boundary outside the perimeter bund in order to preserve the drying hydrology of the adjacent neighbouring vegetation.

6.0 Recommendations and Conclusions

6.1 Recommendations relating to downstream environments

The proposed development of the site is not expected to significantly impact the downstream environments. The ditches and channel are of little ecological value and can accommodate the expected increase in runoff. The low lying areas of Freshwater Wetlands EEC that will be subject to additional runoff are a community of marsh-type plant species that are pre-adapted to wet conditions and inundation. Additionally, this area has been significantly impacted by a more dominant hydrological influence, namely the intrusion of tidally driven, saline water. Similarly, the lake ecosystem south of Weir Road has also been significantly impacted by tidal salty water.

Therefore, the operational controls proposed in the WCMP to minimise changes to site hydrology are no longer considered to be required as it is expected that:

- It is estimated that the development of the proposed Facility will result in an increase of surface runoff from the site from in the order of 8 to 11 ML per annum. Because the drainage downstream of the Freshwater Wetlands EEC is controlled by the culvert level and not natural impeded drainage, any additional increase in runoff will not lead to increased depth of inundation i.e. most of the additional volume will flow quickly through the culvert to the lake downstream. An increase in site runoff will therefore only increase the frequency and duration but not the depth nor lateral extent of inundation. The expected increased frequency and duration of inundation resulting from the extra runoff is within the tolerance limits of this vegetation community.
- Since the culvert controls the water levels of both the freshwater inundation from upstream and the downstream tidal intrusion, the impacts on the Freshwater Wetlands EEC will be limited to the same spatial extent as the tidal influence.
- Impacts arising from additional flow will be much smaller than the negative impacts of tidal intrusion into the freshwater wetlands EEC, and may have the beneficial effect of diluting brackish water and providing the vegetation with relief from exposure to saline water.

Managing the water quality of runoff from the site is still considered important for the protection of the downstream environments. The WCMP outlines a treatment train that will ensure appropriate treatment of site runoff to mitigate potential impacts of polluted site runoff. The proposed treatment system will treat runoff to a standard equivalent to best practice required for runoff from urban development, which has been assessed to be within the tolerance limits of the SEPP 14 Wetland communities and aquatic ecosystems of the lake.

6.2 Recommendations relating to the adjacent and upstream environments

The impacts of development on the adjacent swamp forests can be mitigated with the following simple measures.

6.2.1 Drainage ditch

A drainage ditch along the western boundary is required outside the perimeter bund to maintain the drying hydrology of the adjacent swamp forests within the tolerance limits of the vegetation that grows there. The drainage ditch should be approximately 300mm deep to ensure that nearby surface soils do not remain waterlogged. The purpose of the ditch is to drain the surface soils rather than to convey a specific flow and does not need to be built to a specific gradient. The final form will be subject to detailed design. It is anticipated that the

ditches may be 1000 mm wide with 1:1 batters to the base (approx 300mm deep). To stabilize the batters and base of the drainage ditch, it should be densely vegetated with sedges and grasses such as *Carex apressa*, *Juncus usitatus* and *Gahnia spp.* and *Imperata cylindrica*.

6.2.2 Culverts beneath site access road

A new site access will be created on the southern border of the site from the Weir Road to the site. In order to prevent impeded drainage on the western side of the access road, and to provide relief from inundation for the swamp forests in the vicinity, hydraulic connection should be provided under the access road. It is recommended that this be in the form of several small culverts across the access road to provide even drainage across the width of the area between The Weir Road and the site, in order to mimic the existing moisture gradients in this area.

Impacts on the surrounding environments will therefore be mitigated by maintaining or augmenting the function of the existing drainage elements of the site.

Yours faithfully

Dr Peter Breen

Dr Courtney Henderson

Appendix F

Ecotone Supplementary Letter on Wetlands

ECOTONE ECOLOGICAL CONSULTANTS Pty Ltd

- **Ecological Research**
- **Flora, Fauna & Biodiversity Surveys**
- **Specialised Bat Studies**
- **Bushland/Vegetation Management Plans**
- **Vertebrate Pest/Predator Management & Monitoring**
- **Impact Assessment Reports**
- **Offset & BioBanking Assessments**
- **Nest Box Installation & Monitoring**
- **Wildlife Monitoring & Management**
- **Wildlife Photography**

12 January 2011

Mr Joshua Lasky
AECOM
PO Box Q410 QVB Post Office
SYDNEY NSW 1230

Dear Josh,

Re: Site Inspection of Freshwater Wetland Downstream from the Proposed Teralba Recycling Centre

As requested, I attended a site inspection at the proposed Teralba Recycling Centre site with Courtney Henderson from AECOM on 8 November 2010. The purpose of the inspection was to provide an independent opinion on the salinity of the SEPP14 freshwater wetland mapped by Ecotone in 2008, and the possible future ecological implications for the wetland of runoff from the proposed facility. The wetland would be the primary receiving environment for treated freshwater runoff from the proposed facility, via an existing drainage channel. Hydrological modelling has predicted that there would be a 20-30% increase in the runoff discharged from the site into the receiving environments.

It should be noted that the wetland itself (excluding fringing vegetation) as documented by Ecotone in 2008 was never in good ecological condition and in its dry state consisted almost entirely of introduced pasture grasses subjected to ongoing cattle grazing.

Due to recent heavy rains, the wetland itself (Vegetation Community 6 from Ecotone 2008) was full of water at the time of the site visit in contrast to a totally dry state when originally inspected in 2008. Recent hydrological and ecological investigations by AECOM indicate that the wetland is tidal due to the connection of a large lake south of Weir Road to the saltwater Cockle Creek. This lake is connected to the freshwater wetland by a channel/ culvert under Weir Road and it is believed that salt water can enter the wetland via the connecting channel when the lake level rises.

Following the recent site visit I can confirm that a few flora species more characteristic of saline environments were present in the freshwater wetland. These included a minor presence of the native saltmarsh plant *Sarcocornia quinqueflora* subsp. *quinqueflora* (samphire or glasswort); the introduced plants *Cotula coronopifolia* (water buttons) and *Atriplex prostrata* (orache). Some dieback of characteristic freshwater species was apparent, including *Juncus usitatus,* although the fringing paperbarks (mainly *Melaleuca linariifolia* and *M. decora*) appeared to be in good health.

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These species composition of the wetland vegetation appears to reflect the prevailing salinity level of the water and could be influenced on a cyclical basis by the amount of freshwater entering the wetland from rainfall and runoff.

The upper tidal or saltwater limit of the wetland appears to occur in the drainage channel into the wetland from the subject site, where an informal road in the powerline transmission easement crosses the channel over a small culvert of pipes. On the downstream side of this crossing, the salt-tolerant species referred to above occurred. However, the suite of species on the upstream side of the road crossing was different and included many freshwater species that reflect the lack of salt influence. They included *Persicaria hydropiper, Ranunculus inundatus* (river buttercup), *Spirodela* sp. (duckweed) as well as the grasses *Pennisetum clandestinum* (kikuyu) and *Cynodon dactylon* (couch). The spatial extent of the saltwater influence on the vegetation community is otherwise limited to the lowest lying area of the open grassy depression that is most frequently inundated, and the channel connecting the SEPP14 freshwater wetland to the large lake south of Weir Road.

It is noted that because the treated runoff water from the subject site would be directed into the drainage channel that flows into the wetland, the project would have no hydrological impact on the swamp forest endangered ecological community that adjoins the site along its eastern boundary (Community 3 of Ecotone 2008), and is also a mapped part of the SEPP14 wetland. This community has already been impacted by a degree of impoundment of water resulting from construction of Weir Road along the southern boundary of the subject site.

In conclusion, I concur with the findings of AECOM regarding the salinity status of the freshwater wetland and the species composition that appears to indicate this. I do not consider that the estimated increase in the average volume of runoff from the subject site ultimately entering the wetland would have a significant adverse affect on the species composition or overall ecological health of the SEPP14 wetland. The net result may be a slight increase in the periods of inundation to that which the wetland currently experiences due to the additional water, but I consider them to be within the tolerance limits of the wetland flora. These species are already adapted to substantial and sometimes rapid changes in the quantity of water due to the prevailing climatic conditions. The wetland would have been completely dry on the surface for long periods during the extended drought conditions of recent years, but is now full of water and is likely to remain in that state for some period (up to several months or even years) due to the expected higher than average rainfall predicted from long-term forecasts of regional weather patterns.

In my considered opinion, any changes to the wetland flora due to the anticipated increased quantity of fresh water runoff would be minimal compared to the impacts of the varying levels of salinity to which the wetland is currently subjected. In fact the increased fresh water is more likely to be beneficial to the wetland by diluting the salt water and effectively counteracting the influences of salt water from the lake to the south.

Yours sincerely,

Stefan Rose
Senior Ecologist

Appendix G

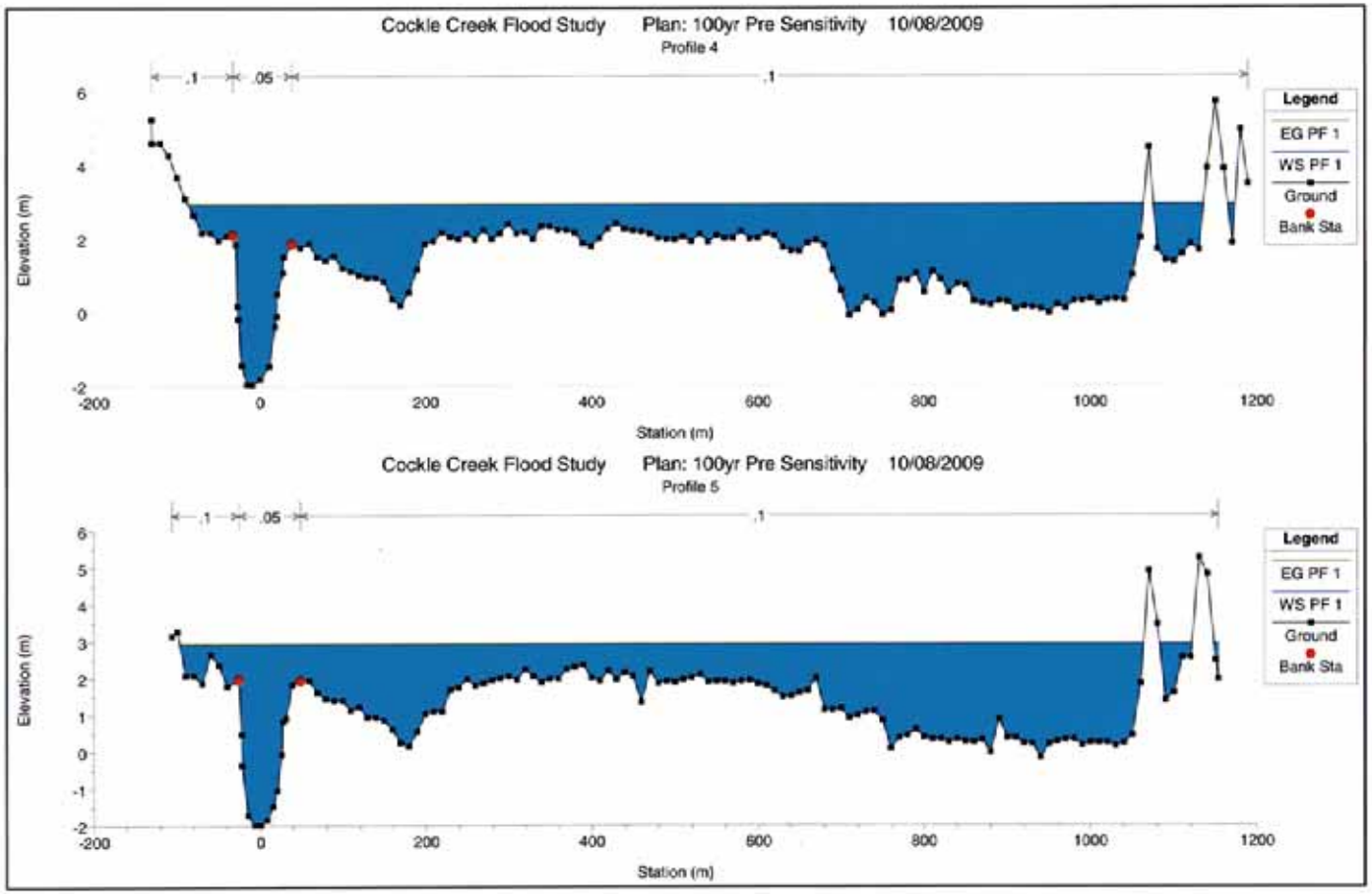
Appendix E and F of the Flood Report

APPENDIX E - HEC-RAS Output Data 100 year ARI Event with Climate Change Considered

HEC-RAS Plan: 100 Pre Sensitiv River: Cockle Creek Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	1442	PF 1	541.00	-1.18	3.61	1.36	3.65	0.000476	1.17	1020.63	521.09	0.18
1	841	PF 1	541.00	-2.06	3.08		3.19	0.001126	1.57	537.98	282.16	0.26
1	509	PF 1	541.00	-1.97	2.94		2.95	0.000240	0.70	2014.22	1219.31	0.12
1	487	PF 1	541.00	-1.98	2.93		2.94	0.000216	0.66	2074.11	1204.91	0.11
1	283	PF 1	541.00	-1.58	2.90		2.90	0.000141	0.48	2422.89	1145.76	0.09
1	272	PF 1	541.00	-1.72	2.90		2.90	0.000135	0.47	2463.76	1163.29	0.09
1	225	PF 1	541.00	-1.79	2.89		2.89	0.000139	0.48	2460.20	1193.79	0.09
1	143	PF 1	541.00	-2.13	2.88		2.88	0.000143	0.54	2418.77	1181.42	0.09
1	0	PF 1	541.00	-1.62	2.85	1.19	2.86	0.000198	0.55	2056.22	1084.83	0.11

Cockle Creek Flood Study
Plan: 100yr Pre Sensitivity 10/08/2009
Profile 1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study
Plan: 100yr Pre Sensitivity 10/08/2009
Profile 2
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)


Cockle Creek Flood Study Plan: 100yr Pre Sensitivity 10/08/2009
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.1
.05
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study Plan: 100yr Pre Sensitivity 10/08/2009
Profile 5
.1
.05
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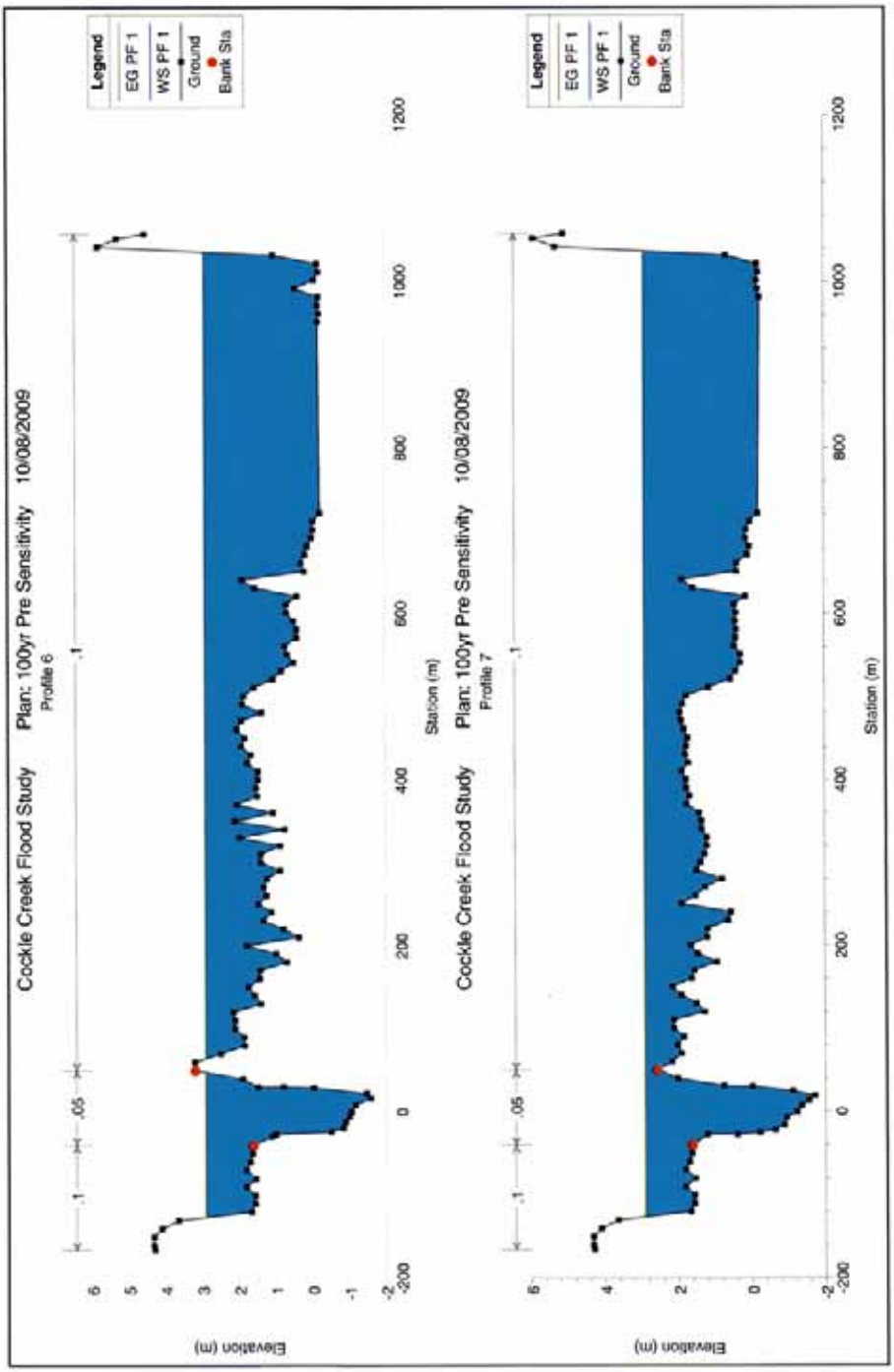
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)


Cockle Creek Flood Study
Plan: 100yr Pre Sensitivity 10/08/2009
Profile 6
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study
Plan: 100yr Pre Sensitivity 10/08/2009
Profile 7
Legend
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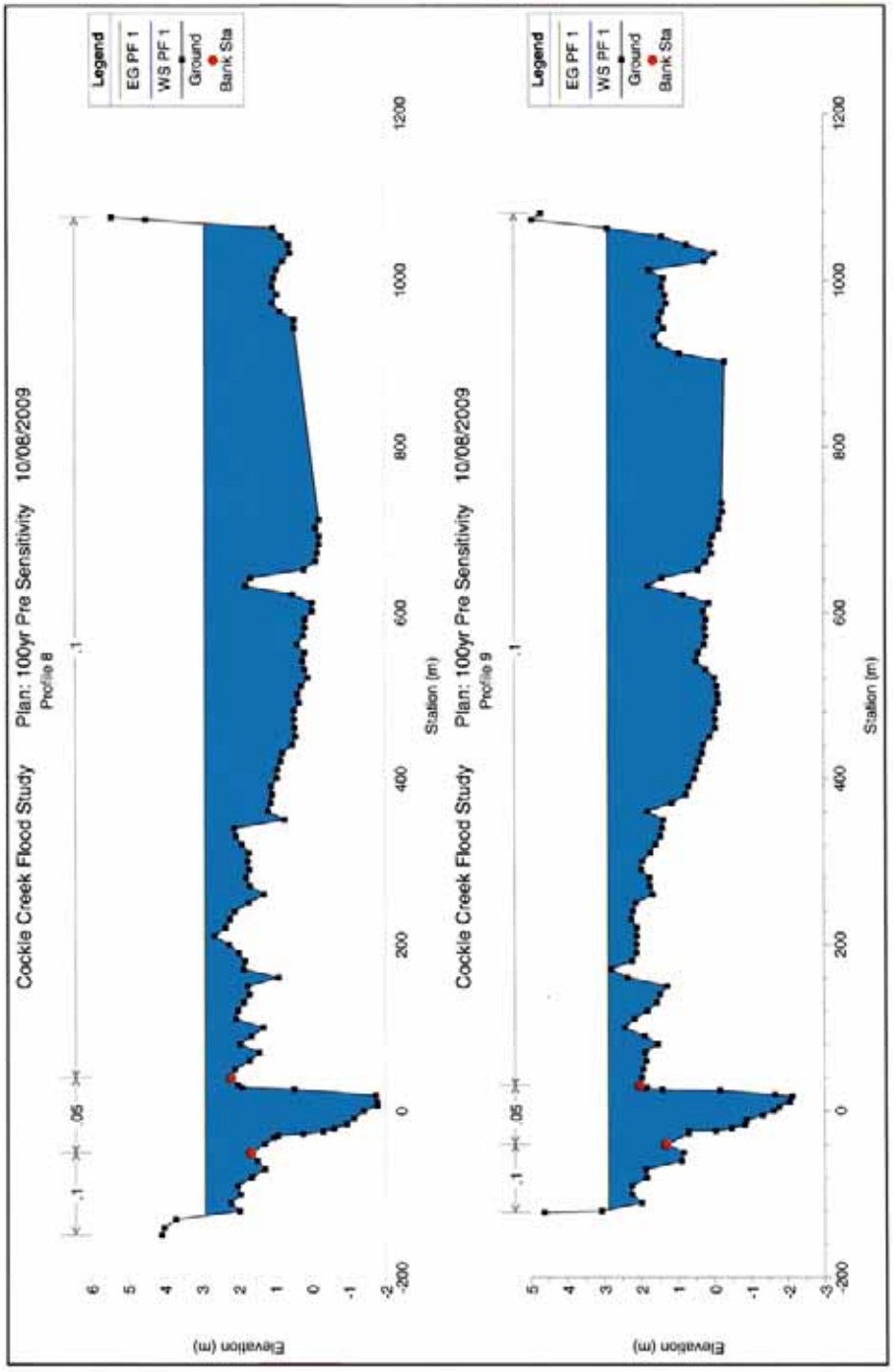
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)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Profile 8
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EG PF 1
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Elevation (m)
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Cockle Creek Flood Study Plan: 100yr Pre Sensitivity 10/08/2009
Profile 9
Legend
EG PF 1
WS PF 1
Ground
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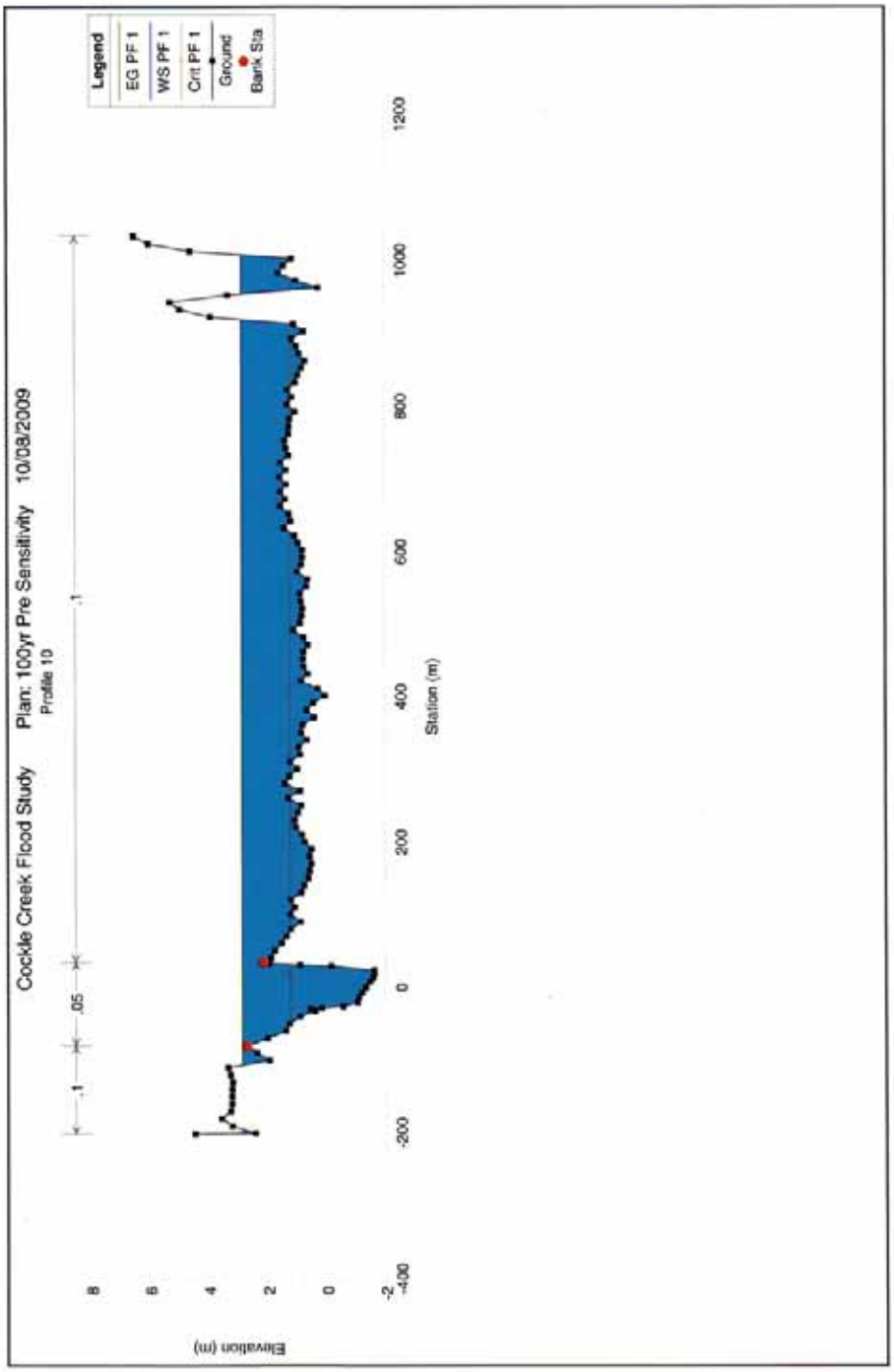
Elevation (m)
Station (m)


Cockle Creek Flood Study
Plan: 100yr Pre Sensitivity 10/08/2009
Profile 10
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Crit PF 1
Ground
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Elevation (m)
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8
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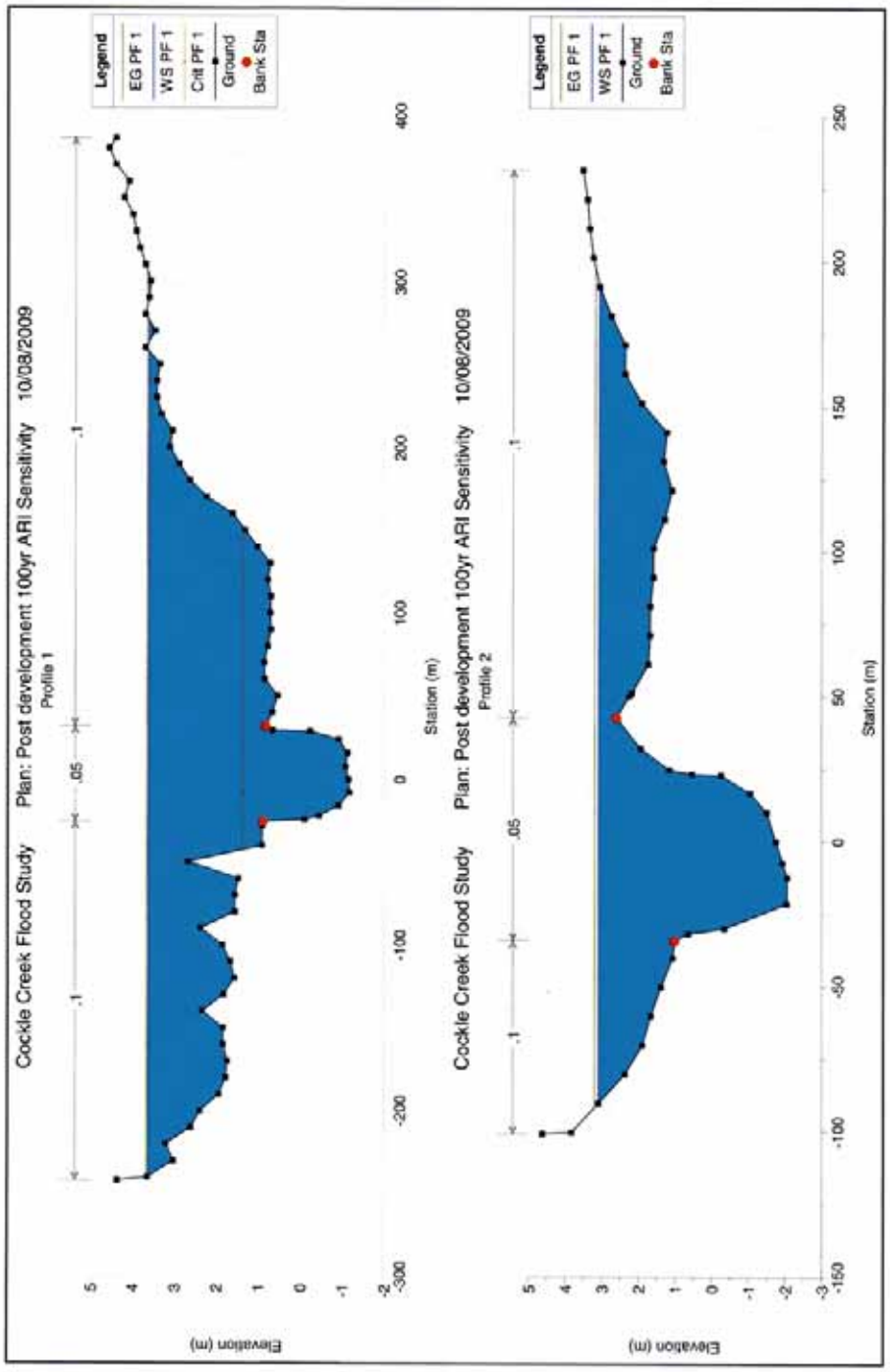
0
-2
-400
-200
0
200
400
600
800
1000
1200
.1
.05
.1
.1

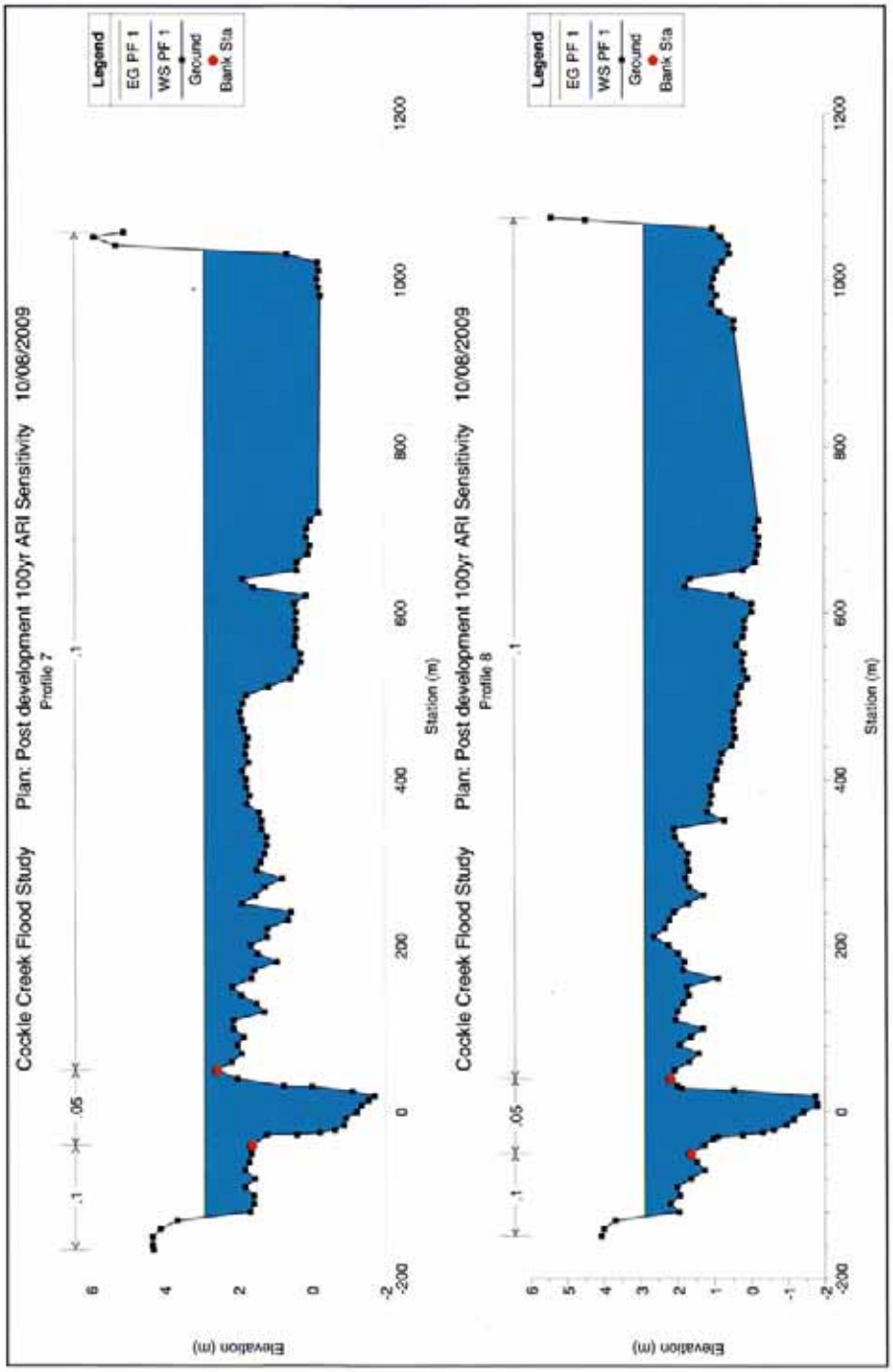
HEC-RAS Plan: 100 Post Sensiti River: Cockle Creek Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	1442	PF 1	541.00	-1.18	3.61	1.36	3.65	0.000474	1.17	1022.56	522.78	0.18
1	841	PF 1	541.00	-2.06	3.08		3.19	0.001121	1.57	539.03	282.42	0.26
1	509	PF 1	541.00	-1.97	2.94		2.95	0.000238	0.70	2020.66	1219.54	0.12
1	487	PF 1	541.00	-1.98	2.94		2.95	0.000225	0.67	1893.83	1000.20	0.12
1	385	PF 1	541.00	-1.78	2.91		2.92	0.000219	0.63	1801.25	853.15	0.11
1	283	PF 1	541.00	-1.58	2.90		2.90	0.000159	0.51	2062.95	898.68	0.10
1	272	PF 1	541.00	-1.72	2.90		2.90	0.000135	0.47	2463.67	1163.29	0.09
1	225	PF 1	541.00	-1.79	2.89		2.89	0.000139	0.48	2460.14	1193.79	0.09
1	143	PF 1	541.00	-2.13	2.88		2.88	0.000143	0.54	2418.77	1181.42	0.09
1	0	PF 1	541.00	-1.62	2.85	1.19	2.86	0.000198	0.55	2056.22	1084.83	0.11


Cockle Creek Flood Study Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 2
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)

Cockle Creek Flood Study
Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study
Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 5
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)

Cockle Creek Flood Study
Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 5.5
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study
Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 6
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)


Cockle Creek Flood Study Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 7
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 8
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)

Cockle Creek Flood Study Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 9
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (m)
Station (m)
Cockle Creek Flood Study Plan: Post development 100yr ARI Sensitivity 10/08/2009
Profile 10
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (m)
Station (m)

APPENDIX F – Impact of Loss of Flood Storage

Volumetric Analysis

The proposed development site generally sits between RL 2.0 – 3.0m AHD with small areas in the south eastern corner being as low as RL 0.5m AHD.

The 100yr ARI flood level at the site is approximately 2.7m AHD, which results in a net stormwater storage volume of 20,000m^3 being replaced with fill to raise the site to an appropriate level. Refer Civil Cad Volume output for details.

Previous modelling undertaken by the Public Works in Cockle Creek Flood Study June 1986, showed that approximately 1,350,000m^2 of flood storage area exists immediately around the proposed development site.

As a simplistic check to determine the effect of loss of flood storage due to filling on the site, flood level increase equals loss of storage volume divided by flood storage area.

= 20,000m^3 / 1,350,000m^2

= 0.01m

An increase of 0.01m results, which is insignificant in this case. The actual increase is likely to be less, given that multiple storage areas exist in the vicinity and that flows are re-entering the main channel at various locations.

civilcad 6 - VOLUMES REPORT Aug 06, 2009 10:26AM Page: 1

COMPUTATION VIA PRISMS

SURFACES:
==========
Design: 2.700 (m)
Natural: 2246VOL - DTM-01

REGION:
======
Boundary: BND-03

SURFACE AREAS:
============
Design: 53902.9 (square metres)
Natural: 54055.0 (square metres)

PLAN AREAS:
==========
Boundary: 54097.9 (square metres)
Design: 53902.9 (square metres)
Natural: 53902.9 (square metres)

CUT/FILL/MATCHING AREAS:
========================
Cut: 6688.9 (square metres)
Fill: 47214.0 (square metres)
Matching: 0.0 (square metres)
Total Area: 53902.9 (square metres)

WARNING - There is a difference between volumes area and boundary area.

VOLUMES:
==========
Cut: 1399.3 (cubic metres)
Fill: 21134.3 (cubic metres)
Net: 19735.0 (cubic metres) [fill]

Cut: 0.2 (cubic metres) / (square metres)
Fill: 0.4 (cubic metres) / (square metres)

Average Cut Depth: 0.2 (m)
Maximum Cut Depth: 2.0 (m)

Appendix H

Advanced Treescape Letter Report on Angophora inopina Trees

19th January, 2011.

Mr Joshua Lasky
Principal Environmental Engineer
AECOM
Level 11
44 Market Street
SYDNEY NSW 2000

Dear Joshua

Re: *Angophora inopina* (Charmhaven Apple) located in Proposed Teralba Sustainable Resource Centre, The Weir Road, Teralba

AECOM commissioned Advanced Treescape Consulting to provide advice in relation to *A. inopina* (Charmhaven Apple) trees along the western boundary of the proposed Teralba Sustainable Resource Centre (the proposed Facility) for inclusion in the submissions report to the Environmental Assessment (EA) of the Facility.

The proposed development is currently being assessed under the provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). An EA for the proposed Facility has been prepared by AECOM and has been publicly exhibited. At the time of writing of this report AECOM advised that it was preparing a submissions report responding to public and statutory authority submissions on the EA.

An *Ecological Impact Assessment* was prepared by Ecotone in 2010 to inform the environmental assessment and the concept design development of the Facility. The *Ecological Impact Asses*sment which was appended to the EA identified nine *A. inopina* (Charmhaven Apple) trees along the western site boundary of which seven were within the proposed perimeter bund footprint. The EA committed to retain these trees, where practicable, through provision of retaining walls around the trees.

Advanced Treescape Consulting was engaged to:

- Inspect the *A. inopina* (Charmhaven Apple) trees potentially at risk from the proposed development;
- Advise on the practicality of retaining the *A. inopina* (Charmhaven Apple) trees and any design measures that would need to be incorporated during detailed design and management measures that would need to be implemented during and post construction to protect the trees.

The site of the proposed Facility was previously a night soil depot which is now a large area of mainly treeless grasslands.

Around the perimeter of the site is remnant forest in the adjoining blocks and in corners of the site - contained within this remnant forest are some *A. inopina* (Charmhaven Apple) which are a listed Threatened Species under the *Threatened Species Conservation Act 1995.*

These trees are located along the north-western boundary and along the south-western corner of the site. Advanced Treescape Consulting identified 15 x *A. inopina* (Charmhaven Apple) along the northern part of the western site boundary compared to the 9 identified in the Ecotone *Ecological Impact Assessment,* of which 13 were within or directly adjacent to the proposed bund footprint. The trees observed are generally young mature and only two of the trees inspected have any seed pods visible on them. All other trees have yet to reach maturity to produce seed pods. These trees are generally located 600mm from the boundary through to 4 metres from the boundary and they are randomly placed along the boundary fence line.

The proposed works involve constructing a bund which is to be located within 1 metre of the boundary. In the EA it was proposed to accommodate the trees, if practicable, with a small cut out of the perimeter bund.

However, there is an existing swale which runs along the boundary with a width of between 1-4 metres extending from the boundary into the site. The swale drains excess water from the site. It is important that this drainage be maintained.

The proposal to retain the *A. inopina* (Charmhaven Apple) trees along the fence line will be an issue as it is not possible to accommodate the existing trees and provide a functional swale due to their location. Construction of the bund will necessitate inclusion of a new swale outside of the bund to the west to prevent waterlogging at the base of the bund.

In my professional opinion, if the swale were not installed many *A. inopina* (Charmhaven Apple) located in the adjoining block could be negatively impacted by water logging of soils to the west of the bund and this would be an unacceptable situation as the trees on the adjoining block are a lot more mature than those on the site to be developed. .

Furthermore as several trees located onsite are a number of metres inside the perimeter fence substantial modifications to the proposed bund would need to be made to avoid all of the trees.

The bund and necessary swale for drainage would seriously impact the trees and it is Advanced Treescape Consulting's opinion that the only sensible option in this case is to remove the existing trees and replace them at a suitable ratio as specified by an Ecologist or the Department of the Environment, Climate Change and Water.

Replacement of these trees at a suitable ratio and their successful management into the future to maturity is considered the most favourable outcome and is considered to be a readily achievable exercise

In conclusion, it is recommended that all the *A. inopina* (Charmhaven Apple) located within the area to be developed to accommodate the bunds and swale on the northern side of the western boundary be removed and replaced at a suitable ratio. It is recommended that seed be collected from *A. inopina* trees in the immediate area and be grown onto young trees that can be transplanted into the area to be replanted. The area nominated by CiviLake to the east of the proposed Facility to accommodate trees appears to be very suitable as there are remnant forest trees growing in the soils indicating that the soils haven't been contaminated and are suitable for tree growth.

I trust the above meets with your approval. If you have any queries please do not hesitate to contact me directly on 0408 439 186.

Yours sincerely,

R. Kingdom

R. J. Kingdom MIACA MAIH MAAL
Grad. Dip. Hort.
Dip. Hort
Dip. Hort/Arboriculture
Arboriculturist & Horticulturist
Advanced Treescape Consulting

Appendix I

Ecotone Letter Report on Angophora inopina Trees

ECOTONE ECOLOGICAL CONSULTANTS Pty Ltd

- **Ecological Research**
- **Flora, Fauna & Biodiversity Surveys**
- **Specialised Bat Studies**
- **Bushland/Vegetation Management Plans**
- **Vertebrate Pest/Predator Management & Monitoring**
- **Impact Assessment Reports**
- **Offset & BioBanking Assessments**
- **Nest Box Installation & Monitoring**
- **Wildlife Monitoring & Management**
- **Wildlife Photography**

20 January 2011

Mr Joshua Lasky
AECOM
PO Box Q410 QVB Post Office
SYDNEY NSW 1230

Dear Josh,

Re: Management of Impacts on the *Angophora inopina* trees along the western boundary of the Proposed Teralba Recycling Centre and impacts of the proposed entry road intersection at Weir Road

This letter provides an updated strategy for management of the vulnerable *Angophora inopina* trees in the western boundary area of the subject site. These trees were originally detected during a study for the Teralba LES (Ecotone Ecological Consultants 2008) and their positions were subsequently surveyed as part of the Impact Assessment Report for the proposed Recycling Centre (Ecotone Ecological Consultants 2010). The issue of recent minor modifications to the design of the intersection for the southern entry road to the site at The Weir Road is also addressed.

Angophora inopina

Although the Impact Assessment Report (Ecotone Ecological Consultants 2010) stated that 7 *Angophora inopina* trees could be affected by the proposal along the western boundary, it is now apparent from a re-survey of the site on 12th November 2010 by myself that up to 13 trees occur within a part of the subject site that could potentially be affected by the proposal.

Following an inspection of these trees on 8th November 2010, Russell Kingdom of Advanced Treescape Consulting was of the opinion that there were limited opportunities to retain and protect many of the trees within the framework of the current proposal. Many were in poor health and condition according to Mr Kingdom and he believes that translocated ones would be likely to do better in a suitable area of protected habitat (recipient site) in the adjoining lands. Therefore, the originally proposed conservation strategy for the species as presented in the Impact Assessment Report (Ecotone Ecological Consultants 2010) needs to be reconsidered.

Given the locations of the trees in relation to the site boundary / proposed perimeter bund, it is anticipated that none would be likely to survive the proposed development and that all would ultimately be lost as a direct result of the proposal. These would need to be offset by propagation and replanting of trees in suitable offset areas within Council-owned land.

In order to objectively determine the species credits that would be required to offset the loss of the *Angophora inopina* trees, the DECCW biobanking calculator was used for the development site. It

should be noted that the calculator was used purely to calculate the species credits required for the loss of *A. inopina,* and those that could be generated in an offset site. A formal biobanking assessment was not undertaken and the results are not intended to form the basis of an ultimate BioBanking Agreement. According to the biobanking calculator, a total of 217 species credits would be required to offset the loss of the 13 trees from the proposed development site.

A suitable offset area to enable translocation of propagated stock of an appropriate number of *Angophora inopina* trees has been identified on Council land to the east of the subject site (between the existing Worm Farm and the fresh water wetland) in an area which is zoned 7(1). CiviLake have advised that this area would be formally protected in perpetuity by a suitable legal mechanism. The Biobank function of the biobanking calculator was used to determine the species credits that could be obtained from this offset area assuming that 100 healthy, mature trees would be established in the area. The result was that successful establishment of this number of trees would generate 240 species credits for *A. inopina*. On this basis, it its clear that 2.4 species credits would be created for each successful individual established. This ratio was found to stay constant regardless of the number of trees successfully established. Therefore, in order to obtain the required 217 species credits, at least 91 healthy trees would need to be established in a suitable offset area by propagation of local seed and planting (translocation). This represents an offset ratio of approximately 7:1. Details of the proposed translocation process and offset area management plan are given in **Appendix 1**.

In the field investigations for the Impact Assessment Report, it was found that the existing population of *Angophora inopina* extended well to the west of the site boundary in the adjoining land. Within a 30m investigation buffer of the site boundary, at least 52 individuals were found to occur and the population was noted to continue beyond this area. A number of individuals were also recorded in the south-west corner of the site (which is a conservation area) and in Council-owned land to the east of the site. A total of 20 individuals were also recorded in the south-west corner of the site that would remain undeveloped during a site visit by Russell Kingdom and myself on 14th January 2011. Therefore, the population would remain viable in spite of the loss of 13 trees as a result of the proposal due to the presence of 20 on-site trees in habitat that would not be impacted, numerous off-site trees plus the minimum 91 translocated trees in an offset area protected in perpetuity.

The conservation and management of the offset / compensatory trees and habitat is considered to be sufficient and appropriate according to the DECCW guidelines, by reference to the '*Principles for the use of biodiversity offsets in NSW*', as discussed below.

For the purposes of the guidelines, the definition of a biodiversity offset given by DECCW is as follows:

> "*A biodiversity offset is one or more appropriate actions that are put in place to counterbalance specific impacts on biodiversity. Appropriate actions are long-term management activities to improve biodiversity conservation. This can include legal protection of land to ensure security of management actions and remove threats*."

Individual responses to the 13 principles for offsetting in relation to the proposed offset strategy are given below.

1. Impacts must be *avoided first* by using prevention and mitigation measures.
Offsets are then used to address remaining impacts. This may include modifying the proposal to avoid an area of biodiversity value or putting in place measures to prevent offsite impacts.

The project has been designed to avoid impacts on threatened species and EECs as far as operational requirements for the proposed facility will possibly allow. The proposal has already been modified to reduce impacts on sensitive EEC habitat. Twenty *Angophora inopina* trees occur in the offset area for the EEC in the south-western corner of the site in which weeds and threatening processes will be managed and the habitat quality improved. Additionally, at least 91 trees will be established in a protected nearby offset area to provide the necessary species credits according to the biobanking calculator.

2. All regulatory requirements must be met

Offsets cannot be used to satisfy approvals or assessments under other legislation, e.g. assessment requirements for Aboriginal heritage sites, pollution or other environmental impacts (unless specifically provided for by legislation or additional approvals).

The offsets would be provided purely to counterbalance the specific impacts on biodiversity as a result of the project and as assessed under the Part 3A assessment would not be used to satisfy approvals or assessment under any other legislation.

3. Offsets must never reward ongoing poor performance

Offset schemes should not encourage landholders to deliberately degrade or mismanage offset areas in order to increase the value from the offset.

The offset habitat areas would be set up and managed professionally, including monitoring, to maximise the long-term survival of as many planted trees as possible. The 7:1 offset ratio would ensure that the net population size would be substantially increased as a direct result of the development.

4. Offsets will complement other government programs

A range of tools is required to achieve the NSW Government's conservation objectives, including the establishment and management of new national parks, nature reserves, state conservation areas and regional parks and incentives for private landholders.

The managed offset areas would be additional to and would complement formal conservation areas protecting the species in the region.

5. Offsets must be underpinned by sound ecological principles

They must:

- *include the consideration of structure, function and compositional elements of biodiversity, including threatened species*
- *enhance biodiversity at a range of scales*
- *consider the conservation status of ecological communities*
- *ensure the long-term viability and functionality of biodiversity.*

Biodiversity management actions, such as enhancement of existing habitat and securing and managing land of conservation value for biodiversity, can be suitable offsets. Reconstruction of ecological communities involves high risks and uncertainties for biodiversity outcomes and is generally less preferable than other management strategies, such as enhancing existing habitat.

The offset area has been specifically chosen to be in disturbed natural habitat which can be regenerated and enhanced, but full reconstruction of any ecological community will not be attempted for offset purposes. An assessment of the impact of planting the trees within the offset habitat on other natural elements has been made according to established ecological principles. In other words, it has been ensured that the habitat is suitable and that the planted trees will form a compatible part of the established community.

6. Offsets should aim to result in a net improvement in biodiversity over time

Enhancement of biodiversity in offset areas should be equal to or greater than the loss in biodiversity from the impact site.

Setting aside areas for biodiversity conservation without additional management or increased security is generally not sufficient to offset against the loss of biodiversity. Factors to consider include protection of existing biodiversity (removal of threats), time-lag effects, and the uncertainties and risks associated with actions such as revegetation.

Offsets may include enhancing habitat, reconstructing habitat in strategic areas to link areas of conservation value, or increasing buffer zones around areas of conservation value and removal of threats by conservation agreements or reservation.

Given time, it is most likely that the population of *Angophora inopina* will increase in number compared to the present situation, particularly when the population is self-sustaining and recruitment of new individuals occurs. The conditions to maximise the likelihood of this occurring would be created by appropriate management of the recipient habitat areas. The health of the entire ecosystem in the recipient site has been considered and planned for in development of an Offsets Management Plan template (see Appendix 3). The Offsets Management Plan will be completed prior to commencement of construction and prior to any disturbance of the *Angophora inopina* trees.

7. Offsets must be enduring – they must offset the impact of the development for the period that the impact occurs

As impacts on biodiversity are likely to be permanent, the offset should also be permanent and secured by a conservation agreement or reservation and management for biodiversity. Where land is donated to a public authority or a private conservation organisation and managed as a biodiversity offset, it should be accompanied by resources for its management. Offsetting should only proceed if an appropriate legal mechanism or instrument is used to secure the required actions.

An appropriate legal mechanism to ensure protection of the offset areas at least for the life of the development will be negotiated. See Principle 13.

8. Offsets should be agreed prior to the impact occurring.

Offsets should minimise ecological risks from time-lags. The feasibility and in-principle agreements to the necessary offset actions should be demonstrated prior to the approval of the impact. Legal commitments to the offset actions should be entered into prior to the commencement of works under approval.

An appropriate legal mechanism to guarantee protection of the offsets in perpetuity will be negotiated prior to commencement of the project (see Principle 13).

9. Offsets must be quantifiable - the impacts and benefits must be reliably estimated.

Offsets should be based on quantitative assessment of the loss in biodiversity from the clearing or other development and the gain in biodiversity from the offset. The methodology must be based on the best available science, be reliable and used for calculating both the loss from the development and the gain from the offset. The methodology should include:

- *the area of impact*
- *the types of ecological communities and habitat/species affected*
- *connectivity with other areas of habitat/corridors*
- *the condition of habitat*
- *the conservation status and/or scarcity/rarity of ecological communities*
- *management actions*
- *level of security afforded to the offset site.*

The best available information/data should be used when assessing impacts of biodiversity loss and gains from offsets. Offsets will be of greater value where:

- *they protect land with high conservation significance*

- *management actions have greater benefits for biodiversity*
- *the offset areas are not isolated or fragmented*
- *the management for biodiversity is in perpetuity (e.g. secured through a conservation agreement).*

Management actions must be deliverable and enforceable.

The offset strategy would seek to ensure a like-for-like or better replacement for the unavoidable loss of threatened trees. The level of offsets required has been objectively determined using the DECCW biobanking calculator. The result is that for each tree lost, the net result would be at least seven healthy trees of the same provenance as those lost growing in an area of protected and managed habitat.

With reference to the bullet points listed above, the strategy would address (but not necessarily be limited to) the following:

- Since the impact involves the loss of a specific number of threatened trees of one species rather than an area of habitat, the extent of impact is defined as the loss of 13 threatened trees and associated habitat. The replacement ratio for trees lost would be 7:1, therefore at least 7 times the trees lost (91 trees) would be provided by translocation into the offset area. This would achieve more than a like-for-like replacement for the lost trees.
- The impact would affect a single threatened species – *Angophora inopina* (scrub apple).
- The trees to be lost are in an area that is directly connected to, but at the edge of a large area of habitat for the species extending some distance into private property to the west of the subject site. No fragmentation of habitat would occur due to removal of the trees. In the case of the recipient site, there is good scope to enhance connectivity with existing areas of similar habitat in the vicinity.
- The condition of habitat in the recipient site has been determined by assessing the type and extent of weed invasion and other potentially threatening processes.
- The conservation status of *Angophora inopina* is Vulnerable under both the NSW TSC Act and Commonwealth EPBC Act. It is abundant from the lower Central Coast to the Lake Macquarie LGA, and extends north to Bulahdelah.
- A template for management actions proposed for the recipient site is provided in Appendix 1.
- The offset sites would be secured by an appropriate mechanism to be agreed between Council and DECCW (see Principle 13).
- The recipient site is located in an area of high conservation significance, being a listed EEC. Given its highly degraded condition, the conservation significance of this land is likely to be increased by planting of the trees and associated management.
- The management actions will maximise the benefits to biodiversity by restoring currently degraded habitat thus leading to an improvement in ecological condition.
- The offset area that has been selected currently has a degree of isolation from other areas of similar habitat, but there is good scope to enhance the links with adjacent areas.
- Management and monitoring will occur for the life of the development, and a legal mechanism will secure the offsets in perpetuity.

Management actions would be deliverable and enforceable through regular monitoring of the recipient sites to assess the health and condition of the trees and habitat, and external auditing by an appropriate authority.

10. Offsets must be targeted.

They must offset impacts on the basis of like-for-like or better conservation outcome. Offsets should be targeted according to biodiversity priorities in the area, based on the conservation status of the ecological community, the presence of threatened species or their habitat, connectivity and the potential to enhance condition by management actions and the removal of threats. Only ecological communities that are equal or greater in conservation status to the type of ecological community lost can be used for offsets. One type of environmental benefit cannot be traded for another: for example, biodiversity offsets may also result in improvements in water quality or salinity but these benefits do not reduce the biodiversity offset requirements.

The net result of the offset strategy would be a like-for-like or better conservation outcome compared to a 'do nothing' option and would improve the overall conservation status of the species in the locality. Retaining the status quo would most likely result in the eventual deaths of the trees in the subject site on the western boundary due to the extent of degradation and weed invasion, and recruitment of new plants would be unlikely to occur without restoration and weed control measures. The offset plantings would specifically target the loss of *Angophora inopina* due to the proposal and would not 'swap' the losses for any other ecological entity.

11. Offsets must be located appropriately.

Wherever possible, offsets should be located in areas that have the same or similar ecological characteristics as the area affected by the development.

I consider the nominated offset area to be in a suitable location on the basis of having similar ecological characteristics to the proposed development area in which the trees are currently growing. Whilst *Angophora inopina* is not currently present in the selected offset area, the closely related common species *Angophora floribunda* occurs within the area indicating indirect suitability of the chosen recipient site.

12. Offsets must be supplementary.

They must be beyond existing requirements and not already funded under another scheme. Areas that have received incentive funds cannot be used for offsets. Existing protected areas on private land cannot be used for offsets unless additional security or management actions are implemented. Areas already managed by the government, such as national parks, flora reserves and public open space cannot be used as offsets.

The offset areas would be supplementary and additional to any amelioration measures put in place for any other purposes.

13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract.

Offsets must be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes.

The offset areas would be legally protected in perpetuity under an appropriate legal mechanism, the exact terms of which would be negotiated between Council and DECCW. A responsible authority would be nominated to audit the works on an established periodic basis to ensure plantings are successful and result in positive biodiversity outcomes. The legal mechanism to be negotiated would be tied to the title of the land.

In order to implement and achieve the conservation objectives for *Angophora inopina*, a detailed Management Plan for the offset areas would be prepared prior to construction by a suitably qualified professional consultant.

Site assessments would be carried out as part of preparation of the plan by suitably qualified professionals in the area of bush regeneration and native flora ecology. They would be carried out in compliance with current best practice and with reference to currently recognised guidelines such as Vallee *et al.* (2004): '*Guidelines for the Translocation of Threatened Plants in Australia'* plus any other recent literature on *Angophora inopina* ecology or related species.

A template for the plan outlining the items that would be addressed is included as Appendix 3.

Given the foregoing considerations, I am confident that the revised offsets strategy proposed will result in a 'maintain or improve' outcome with respect to biodiversity in general, and *Angophora inopina* in particular.

Entry Road Intersection

Based on the concept design, it was estimated that approximately 100m^2 of swamp EEC would be removed at the proposed intersection of the road which would form the main access to the site from The Weir Road at the south. Minor modifications to the design of the intersection (through the detailed design process) will now result in approximately 200m^2 in the south-eastern corner and 400m^2 in the south-western corner of degraded and weedy swamp EEC being permanently removed at the edge of The Weir Road. These modifications to the entry intersection design were required for road safety purposes and to allow power supply to the Site. The revised area to be impacted was inspected by Russell Kingdom and myself on 23rd December 2010. As previously discussed in the impact assessment report and other correspondence, the habitat for the EEC in the revised area of impact was confirmed by us to be in poor condition and very weedy, with few native species. Being at the edge of a major road, the habitat is constantly subject to edge effects including runoff, rubbish dumping and weed invasion from The Weir Road. A few common *Melaleuca* shrubs or trees and other native shrubs or herbs that make up the EEC would be removed by the proposed road intersection.

Much larger areas of the EEC in much better condition occur within the adjoining south-western and south-eastern corners of the site that would not be developed and would be managed and monitored. Additionally, extensive areas of the EEC occur in the vicinity of the subject site and in other areas of the locality. The small area to be disturbed at the roadside is very degraded and represents a very small percentage of the overall area of good quality EEC within the site and beyond. Given these considerations, together with the location and poor conservation value of the small area of near roadside habitat to be removed, I conclude that the recent minor modifications to the design of the entry intersection would not alter my original conclusion that the EEC would not be significantly impacted upon.

Yours sincerely,

Stefan Rose
Senior Ecologist

References

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Appendix 1. Proposed Teralba Recycling Centre: Template of Offsets Management Plan for Translocation of *Angophora inopina*

Background

The proposed recycling centre will involve the loss of 13 individuals of the vulnerable species *Angophora inopina* along the western boundary. The exact requirement for offsets to compensate for this loss of a threatened species was determined objectively by using the DECCW biobank calculator (Version 1.1). A run was performed for both the development site and a nearby offset area that would be planted with translocated *Angophora inopina* trees. The results were that 217 species credits for *Angophora inopina* would be required to compensate for the loss of the trees from the development site. At the offset site, the successful establishment of 91 trees in the long term would generate 218.4 credits. The following template sets out the steps and actions to be included in a full Offsets Management Plan that would guide the process to achieve this outcome.

A detailed Offsets Management Plan based on this template will be prepared prior to construction and disturbance of the *Angophora inopina* trees.

Outline of Items to be Addressed in the Plan

1. Seed collection and propagation phase

- The necessary licences for collection and propagation of seed would be obtained from DECCW. This process is currently underway.
- Once formal approval is obtained, seed would be collected from mature *Angophora inopina* trees within the Teralba site by a suitable arboriculturist/horiculturist.
- The collected seed would be propagated at a suitable nursery such as that operated by Ross Clarke at Lake Munmorah.
- It is anticipated that a minimum production run of 200 tubestock would be propagated. This number is considered to be more than adequate to result in a minimum of 91 successfully established individuals at the offset site, allowing for planting failures and other losses of young plants.

2. Preparation of Offset (Recipient) Site

- The offset area would be protected from physical disturbances and intrusions by erection of a sturdy perimeter fence with a locked gate, at least until the trees have established successfully. The fence should be sufficient to prevent the entry of vehicles, including trail bikes. Appropriate signage would be installed on the gate and fence. Eventual removal of the fence would allow future linkages to be created with nearby ecosystems in the area.
- Protocols for prevention of disease or pathogens (e.g. *Phytophthora cinnamomi*) introduction into the site would be established. These would include applying a Hazard Assessment at Critical Control Points (HACCP), e.g. disinfectant trough, sterilisation of tools, removal/treatment of soil on vehicles, any organic matter/soils brought to site, etc.)
- Where weeds occur at high density (patches of lantana, wild tobacco, dense kikuyu etc.) initial weed removal would be undertaken by mechanical methods using a slasher, backhoe and/ or bobcat. Larger exotic trees such as camphor laurel would be cut down and the wood mulched (if appropriate). Any weed species with high potential for spread of seed would be removed from the site and disposed of appropriately.
- Regular follow-up treatment for weeds is likely to involve judicious spot-spraying with glyphosate or similar targeted herbicide.

- A number of large logs and fallen timber occur throughout the site. The smaller branches would be removed to facilitate movement of machinery throughout the site. These could be mulched for use within the site. The larger logs (many of which have hollows) would be left in place for fauna habitat and to stabilise the soil.
- Works would be carried out in such a manner that the natural hydrology of the site is not adversely affected.
- Mulching of bare areas would be carried out at the planting phase.
- An informal Asset Protection Zone (Inner Protection Area) of mown or slashed grass would be created around the site perimeter for prevention of potential wildfire. It is important to protect *A. inopina* from frequent fire. Controlled ecological burns could be carried out at a later date if deemed desirable.
- Reference photos would be taken from set photo points both before any work is commenced and at the completion of site preparation and planting.
- A legal mechanism to secure protection of the offset sites in perpetuity will be negotiated between the proponent and DECCW.

3. Planting Phase

- A proposed timetable for planting will be developed based on seasonal considerations and expected readiness of tubestock.
- A selection of common native flora species (shrubs, herbs and ground cover) that are known to occur on the site and are of local provenance will also be planted along with the *Angophora inopina* trees at a suitable density.
- The planting density and spacing for trees would be minimum 4 metres apart and randomly planted.
- Protective measures against physical damage, grazing etc. would be provided by the perimeter fence and tree guards around individual plants as required.
- Initial fertiliser application / watering would be applied if required.
- Mulching would be applied around plants as required – composted or worm castings.
- Protocols for prevention of disease or pathogen introduction into sites would be developed e.g. *Phytophthora cinnamomi* – HACCP would be implemented (see 2).
- Follow-up photos of sites would be taken following initial planting.

4. Maintenance Phase

- Frequency of site maintenance visits during the 1st year are expected to be weekly for the 1st month, fortnightly for the 2nd month, then monthly for the rest of the first year – more frequent during extended dry periods. Expected work to be undertaken during each site visit would include weed control, watering, mulching, fertilising etc.
- Supplementary visits to the site would be undertaken during or immediately following any severe weather events (severe storm, extended drought, flood etc.).
- Measurement of growth of plants and monitoring of health and general condition would be undertaken periodically at appropriate intervals – data would be collected from 10% of plantings.
- Survival rate of plants would be assessed and compared to pre-determined benchmarks.
- A water tanker would be allowed for hand watering during longer dry periods, if necessary.
- An Integrated Pest Management Policy would be established that would address safe and appropriate application of any pest control measures as required.
- Should planting or establishment failures exceed expectations adequate replacement trees will be planted to ensure that necessary numbers are complied with.
- Regular assessment of the success of the process would be undertaken and recommendations for any changes to management made. This would be achieved by reviewing data from the monitoring and maintenance visits and recommending any adjustments as required.

– Any follow-up site remedial works would be carried out if and when required.
– Follow-up photos of sites would be taken at each site visit.
– Compliance would be assured by an independent third party on the basis of a review of monitoring data and periodic site inspections.

5. Monitoring Phase

– Once it is determined that the required plants are successfully established, a timetable for longer-term monitoring would be developed (a suggested duration of monitoring would be quarterly monitoring for up to 3 to 5 years from planting and then once a year for perpetuity).
– Monitoring visits would include checking the health, height and survival rate of trees.
– Monitoring and any control of weeds required would be undertaken.
– Carry out remedial works as required.
– Compliance would be assured by an independent third party – each visit will check and report on the above, as per phase 4.