

Section 7

Assessment of

Environmental Impacts

7.1 DISCUSSION OF RELEVANT LEGISLATION

An overview of legislation has been presented in Section 5 of this report. The following, however, addresses specific aspects of the legislation where required.

As previously referenced, the proposed development is permissible within the industrial zoning applying to the land, and is consistent with the Lower Hunter Regional Environmental Plan, which identifies the site for employment lands.

A table assessing the Director General Requirements is located at **Appendix B**.

The required EPBC Assessment has been completed and is attached at **Appendix I**.

SEPP 11 Traffic Generating Development, and the Roads Act will require the involvement of the RTA in terms of traffic assessment and approval of the proposed intersection off Tomago Road. A traffic report has been prepared to address these issues, together with the parking requirements of the development. This is discussed under a separate heading of this report.

SEPP 33 Hazards have been considered under a separate heading later in this section.

SEPP 71 Coastal Protection-Development within the Coastal Zone must consider Clause 8, Matters of Consideration. The following points address these matters:

- (a) **The aims of this Policy set out in clause 2.**

The proposed development is consistent with the aims of the Policy which are generally to protect and manage the natural, cultural, recreational and economic attributes, vegetation and visual amenity of the NSW Coast as it applies to the site.
- (b) **Existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and,**

where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved.

The proposal is consistent with the aims of this policy, any existing public access will not be impeded by the proposed development.

- (c) **Opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability.**

The proposal is consistent with the aims of this policy. The site is not strategically located to provide additional access points to the coastal foreshore.

- (d) **The suitability of development given its type, location and design and its relationship with the surrounding area.**

It is considered that the site is suitable for the proposed development, and that this suitability is evident from the assessment presented in this report. The proposed development is consistent with the strategic planning for the locality, providing employment opportunities as envisaged by the Lower Hunter Regional Environmental Plan, and is consistent with the industrial zoning of the site. The proposal is consistent with the established industrial development in the locality, and the proposed future character of the area.

- (e) **Any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore.**

The proposed development does not impact on the coastal foreshore amenity.

- (f) **The scenic qualities of the New South Wales coast, and means to protect and improve these qualities.**

The proposal is consistent with the aims of this policy.

- (g) **Measures to conserve animals (within the meaning of the [Threatened Species Conservation Act 1995](#)) and plants (within the meaning of that Act), and their habitats.**

The proposal is consistent with the aims of this policy. A Flora and Fauna assessment has been undertaken and is presented separately in this report.

- (h) **Measures to conserve fish (within the meaning of Part 7A of the [Fisheries Management Act 1994](#)) and marine vegetation (within the meaning of that Part), and their habitats**

The proposal is consistent with the aims of this policy, having no impact.

- (i) **Existing wildlife corridors and the impact of development on these corridors,**

The proposal is consistent with the aims of this policy and does not impact on any corridor.

- (j) **The likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards,**

The proposal is consistent with the aims of this policy. The proposal is not subject to any likely coastal processes. The impact of flooding is discussed separately in this report.

- (k) **Measures to reduce the potential for conflict between land-based and water-based coastal activities.**

The proposal is consistent with the aims of this policy and does not result in any conflict between land or water based activities.

- (l) **Measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals.**

The proposal is consistent with the aims of this policy. An Aboriginal Archaeological assessment has been made, and is presented separately in this report. The LALC have concurred with the recommendations of the report.

- (m) **Likely impacts of development on the water quality of coastal waterbodies.**

This matter is addressed separately in this report. Measures are proposed to protect water quality, noting the important RAMSAR and SEPP 14 wetlands nearby.

- (n) **The conservation and preservation of items of heritage, archaeological or historic significance.**

The proposal is consistent with the aims of this policy. There are no items other than those referenced relative to Aboriginal Archaeology.

- (o) **Only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities.**

The proposal is not the subject of consideration under this clause.

- (p) **Only in cases in which a development application in relation to proposed development is determined:**

- (i) **The cumulative impacts of the proposed development on the environment.**

The proposed development will have an insignificant cumulative impact on the environment given that it can be

demonstrated how each issue of the proposal will be adequately managed.

(ii) **Measures to ensure that water and energy usage by the proposed development is efficient.**

This matter is addressed later in this report. Water capture and re-use, and energy efficiency and security of supply have been important considerations in designing the proposed development.

The NSW Threatened Species and Conservation Act has been addressed as part of the Flora and Fauna assessment discussed hereunder.

The need to consider the Hunter Water Special Area Regulation in terms of ensuring no adverse impacts is discussed separately in this report.

7.2 FLORA, FAUNA & ECOLOGICAL

The subject site has a history of grazing, and so is substantially cleared of any vegetation other than pasture grasses. The land has been modified over time with a series of man-made drains which convey water from the site to the wetlands at the rear, a reflection of the use of the site for the grazing of cattle.

A detailed assessment of flora and fauna has been made by Ecobiological, and a copy of their report is located at **Appendix J**.

Field surveys conducted by Ecobiological identified the following threatened fauna on site:

- Eastern Freetail Bat (*Mormopterus norfolkensis*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*)
- Little Bent-wing Bat (*miniopterus australis*)
- Grey Headed Flying Fox (*Pteropus poliocephalus*)
- Grass Owl (*Tyto capensis*)
- Wallum Froglet (*crinia tinnula*)

The proposed development will result in the loss of a relatively small amount of habitat for these species, and the detailed report by Ecobiological concludes that the proposed development will have no significant impact on their communities.

Field surveys conducted by Ecobiological identified two endangered ecological communities on part of the site, being the Swamp Oak Floodplain Forest on the NSW North Coast, Sydney Basin and South East Corner Bioregion and Salt Marsh on the NSW North Coast, Sydney Basin and South East Corner Bioregion. The detailed report included in the

Appendix to the Environmental Assessment Report concludes that the proposed development will have no significant impact on this community.

In addition to the above, it was concluded that the following fauna could be found to use the subject site under the right conditions at various times through the year:

- Australasian Bittern (*Botaurus poiciloptilis*);
- Black-necked Stork (*Ephippiorhynchus asiaticus*);
- Black Bittern (*Ixobrychus flavicollis*);
- Masked Owl (*Tyto novaehollandiae*);
- Large Footed Myotis (*Myotis adversus*); and
- Eastern Bent Wing Bat (*Miniopterus schreibersii oceanensis*).

The detailed report by Ecobiological concludes with reference to the Threatened Species Conservation Act that the proposed development will have no significant impact on these species' use of the site.

The report by Ecobiological identifies the potential for impact of development on the adjoining wetlands including those of which are recognised by SEPP 14 or RAMSAR. The potential for impacts is from contaminated stormwater entering the wetlands, be it from the operations on-site or from the composition of the proposed fill material. There was also the possibility of an altered water flow regime from the site to the wetland.

Redlake Enterprises has adopted a conservative approach to the issue, selecting quality fill material of a neutral ph (fill material will be sand or rock derived from approved local sources). In addition, careful site planning has been carried out to ensure that the flow of water to the wetland from the site is not altered such that it could have an impact on the supply of water to the wetland. In addition, an extensive system has been established to treat water before it is allowed to flow from the site to the wetland. Detailed discussion on the issue of water quality is presented separately in this report (see Concept Engineering, Servicing and Stormwater Management Report at **Appendix F**).

The report by Ecobiological makes a number of recommendations for the monitoring of water quality to ensure on going maintenance of water quality measures and it is proposed to adopt these in full.

The proposed development is a controlled action under the Environment Protection and Biodiversity Conservation Act and an assessment of the proposed development as required is presented in **Appendix I** of this report. It can be concluded from the assessment that the proposed development with proposed environmental controls will have no significant impact on the adjoining RAMSAR wetland.

With the removal of grazing from the site, and the establishment of a proper stormwater treatment system and water quality management and monitoring system, improvement on the current quality of water flow can be expected. Indeed the proposed water quality measures will ensure no negative impact from the proposed development on the receiving environment.

The hydrology modelling undertaken for the proposed development establishes that there is no significant change between existing and post development simulations, that would result in any impact on the wetlands adjacent during the peak 100 year recurrence flood event for the Hunter River. Since it has been demonstrated that there are no issues during this peak event, that is an extreme rare event, it is concluded that there are no additional impacts from flood flows relating to the wetlands from existing to post development scenarios.

In addition, there is no alteration to hydrology, discharge flow regime and velocity and consequently no impact from stormwater discharge from the site during smaller, regular located storm events and daily conditions experienced at the adjacent wetlands, post development.

Advice from Spectrum Acoustics located at **Appendix O** shows that noise levels from the Stage 1 WesTrac operations will be below existing background levels at the wetlands. Accordingly there will be no impact on flora and fauna.

Noise levels from future users within the proposed industrial subdivision are also unlikely to have an impact based on the advice provided by Spectrum Acoustics. In addition, there is significant opportunity to manage future uses and noise impact to ensure this is the case. It is noted that future development will require approval and will be the subject of individual acoustic assessment at that time.

Light source from the WesTrac facility will have no significant impact on flora/fauna within the wetland given the distance from the rear stage 1 boundary to the wetland. However, notwithstanding this, it is proposed to prepare a Light Management Plan to address positioning of lighting, direction and shielding to prevent direct light toward the Wetland area.

Lighting from future users within the proposed industrial subdivision could also be managed through implementation of a Lighting Management Plan and accordingly have no significant impact on flora/fauna within the wetland.

Notwithstanding that it is considered the proposed development could occur to the boundaries where it adjoins the wetland at the South West corner without significant impact, a setback ranging between approximately 40m and 200m has been provided as a buffer. This is shown on the overall layout plan and engineering drawings.

The development of the subject land for industrial purposes was anticipated as part of the rezoning of the site from rural to industrial. Some 240 hectares of land zoned for agricultural use was set aside for conservation purposes. The area shaded green in Figure 7 of this report is the relevant area for conservation. This offset was the subject of a formal Memorandum of Understanding between Landholder, Minister for the Environment and the Minister for Planning.

7.3 TRAFFIC, ACCESS & PARKING

Traffic associated with the proposed development will result from three predominate sources at three different 'stages', including filling of the site, WesTrac operations when established on site, and other users as they are established within the proposed industrial subdivision. A traffic report has been prepared by Mark Waugh Pty Ltd and is included at **Appendix G**.

Filling of the site will be carried out by truck & dog, travelling to and from fill sources generally within a half hour travel distance. Filling will be carried out in a staged manner with stage 1 being to allow occupation of the site by WesTrac. A traffic management plan addressing construction traffic has been completed and included at **Appendix G**.

WesTrac operations will generate traffic associated with staff and visitor movements, delivery of parts to and from site, delivery of equipment (large scale low loaders as well as smaller machines) to and from site as well as from field maintenance crews. The delivery of large machinery requires careful consideration, and will generate the need for transporters from time to time counter flow over the north arm of the Hexham Bridge. As this can only be done at night, this will in turn necessitate the need to light Tomago Road to comply with road safety requirements. Accurate numbers of oversized vehicle movements to and from the site are difficult to provide, and will vary with demand. One movement in and one movement out per week may be a reasonable average. Given that these vehicles will be moved at night, when traffic levels are significantly reduced, it is considered that it is not so much a traffic impact issue but a traffic management issue. It will be necessary to comply with the requirements of the RTA for the movement of such loads and it is intended to do so.

As part of the current proposal, it is intended to construct an intersection off Tomago Road for site access. This intersection will be the primary site access to all future development on the whole of the site, and so will be sized accordingly. In order to allow construction of this intersection at the same time as filling operations it will likely be necessary to establish a temporary access, ensuring that trucks carrying fill are kept clear of these works. The intersection will be complete, however, before occupation of the site by WesTrac.

A small part of the site located to the West is earmarked for road widening and the proposed development is not affected by it and vice versa (the road widening is shown in Figure 5).

Given the relatively isolated location of the site from sensitive land uses it is not expected that traffic associated with filling or the future use of the site by WesTrac and future industry will have a significant adverse impact on the amenity of the area.

The traffic report by Mark Waugh Pty Ltd located at **Appendix G** concludes:

- Forecast traffic flows based on standard RTA guidelines for traffic generating developments indicate that the proposed development can be accommodated on the existing road network.
- The sensitivity of the traffic forecasts to the level of background growth assumed, as required by the RTA in considering future flow conditions can affect the timing of possible upgrading being required.
- The site and its operations are able to utilise the existing arterial road system through application of the RTA procedures for transporting over-dimension loads. This includes possibly the necessity to light sections of Tomago Road to allow oversize transport at night along the single carriageway to the Pacific Highway.
- Forecast traffic flows based on standard RTA guidelines for traffic generating developments indicate that the proposed seagull priority controlled intersection has adequate capacity to cater for the future flows associated with the proposed development.

The site layout has been specifically designed to provide the safest traffic and pedestrian environment possible. This has been achieved by an effective separation of light and heavy vehicle traffic and separation of vehicle traffic from pedestrians. This is evident on the plans submitted with the project application.

Having regard to the large footprint of buildings, including buildings whose use will not generate demand for parking, (such as the proposed canteen), it is considered inappropriate to assess the required car-parking for the development based on a rate per square metre. In accordance with the RTA Guidelines it is considered that a merit consideration of the parking based on the actual demand for parking is a reasonable response. A typical rate for parking in this regard can be assessed at 0.8 car spaces per employee. In this case using the likely maximum number of employees at 400 a parking requirement of 320 parking spaces is derived. In addition to this it is possible that a maximum of 40 people would be

attending the WesTrac Institute at any one time. Applying a similar rate of 0.8 spaces per car derives a parking demand for this facility of 32 spaces (it is quite likely however that the WesTrac Institute would generate an average demand less than this given that employees will also be on-site working and then leave work to attend the institute on the same site, so generating no additional parking demand). Accordingly the maximum WesTrac operations and WesTrac Institute parking demand by staff is expected to be 352 spaces. The proposed development actually has provision for 391 parking spaces and 22 motorbike parking spaces and so easily caters for this requirement, leaving a substantial allowance for any casual visitors to the site. The size of the site provides opportunity to informally address any growth or unusual demand for parking beyond that estimated. The lack of parking opportunity on Tomago Road and the distance from the road to the on-site facilities will be a very effective deterrent to street parking.

Incidental parking associated with loading and unloading, machinery repairs and the collection of parts etc can be comfortably met around the site as required.

7.4 FLOODING

As described previously, the site is subject to inundation by regional floods from the Hunter River. Filling of the site is necessary for development of both the subdivision and WesTrac facility. Patterson Britton & Partners were engaged to assess the flood impact of filling of the overall site.

Flood behavior along the Lower Hunter River has been previously defined by Mike 11, 1 Dimensional flood model in 1994. Since this time, flood modelling tools have significantly improved for the modelling of complex systems. Patterson Britton has used a 2 Dimensional model of the Hunter River and its floodplain to assess the flood impact. The 2D model has greater discretisation and the complexity to more accurately predict flood modeling simulation. Initially, prior to simulating any fill on the site, results from the 2D model were verified against the Mike 11 results and a high level of concurrence was reached for the existing simulation.

The results of the modelling show that the peak 100 year recurrence flood is predicted to vary between 2.29m AHD at the western boundary of the site and 2.14m AHD near the eastern boundary of the site.

The model was then modified to reflect the filling of the overall site and simulated to determine flood impact. The maximum increase in peak level, assuming no inundation of the developed site by the peak 100 year recurrence flood level, is 120mm. This occurs immediately west of the proposed filling and development site. Increases in peak flood level in areas outside the RLMC land holding are less than 20mm. The proposed filling is not predicted to increase the provisional flood hazard across land where residential or industrial development currently exists. It is

considered that the potential flood impacts associated with the proposed development of the land are acceptable and will not manifest as significant adverse impacts on adjoining properties.

A copy of the flooding report is located at **Appendix K**.

7.5 VISUAL, AESTHETICS & LANDSCAPING

Terras Landscape Architects have carried out a Visual Impact Analysis of the proposed built form and their report is located at **Appendix L**.

The site has a small viewing catchment and the impact of development is therefore very localised. In addition the site is not prominently located on a ridge line or part of any other significant natural feature that requires preservation. The zoning of the land for industrial purposes is a reflection that a built form outcome for the site is appropriate. In addition development of the site will contribute to the existing variety of built form and typology of uses along Tomago Road.

Notwithstanding that the site is not visually prominent located it is considered appropriate for the proposed development to be enhanced through the incorporation of landscaping. It should be noted that the site currently offers little in the way of landscape presentation to Tomago Road.

Terras Landscape Architects have prepared a landscape plan and this has been included with the submitted plans and located together with a landscape report also at **Appendix L**. The objectives of the Landscape treatment of the site are as follows:

- To create a landscape buffer to the east and south of the site. This will be done using endemic plant species. Trees have been selected for their high and low canopies which will provide a dense vegetation screen between the development and neighbouring properties.
- The front entry carpark and landscaping around Administration and WesTrac Institute buildings will be manicured, with large specimen trees, formal avenues of tall Eucalypts, lawn areas and mass planted gardens.
- The staff carparks will be planted with a mixture of native evergreen trees and exotic deciduous trees to provide plentiful shade. Hedging plants along the perimeters will break views into surrounding areas of hardstand.
- Landscaping on the western boundary along the entry road will consist of an avenue of tall Eucalypts, screen planting along the fence line of Casuarina glauca and tall shrub species.

- A 3.5 metre acoustic fence made of timber will be constructed in the north eastern corner of the site to alleviate noise concerns.
- To provide attractive outdoor areas for staff and visitors that will be utilised for dining, relaxation and passive recreation.

The report by Terras advises that with these landscape treatments in place an attractive and functional landscape will be produced, addressing screening issues while allowing for corporate identity, and providing attractive outdoor areas for staff and visitors to enjoy, as well as shading car parks and enhancing the proposed buildings.

7.6 GEOTECHNICAL

Coffey Geotechnics has undertaken extensive subsurface testing of the site. This was initially commenced as part of the Due Diligence assessment undertaken prior to Redlake Enterprises Pty Limited purchasing the site. The knowledge gained from this testing has been used to devise a strategy for bulk earthworks and filling of the site for development use.

Topographically, the site comprises a low dunal formation up to 8.5m AHD in the northern eastern corner of the site, and a flat, low lying alluvial plain at an elevation of 0.1-1.5m AHD over the remainder of the site. These topographical features reflect two (2) distinctly different soil profiles through the site. The first soil type is the aeolian dunal sands that are part of the Tomago Sandbeds, covered by the Special Area zone boundary. The second soil profile is the alluvial clays and estuarine soil types associated with the floodplains of the Hunter River. These are waterlogged clays, downstream of the Special Area draining to the Hunter River.

In summary, from Section 6.3 of Coffey Geotechnics Report GEOTSGTE20301AA-AI dated 15 November 2007, located in **Appendix M**, it is described that site preparation will involve removal of all shrubs and trees, including the major root bulbs; slashing, and removal of slashings by raking. Stripping of grasses and topsoil will not be undertaken, since this will assist to bridge across the underlying saturated clays. Geotextile fabric will be used for bridging within existing open drains, wherever there is no grass root mat or where the site has become boggy during stripping.

The clays over the low lying areas of the site will be susceptible to creep settlement under development load. To complete the majority of settlements as rapidly as possible prior to development commencement, preloading will be undertaken, by stockpiling material as a surcharge load over the underlying clays. The surcharge fill load placed will be equivalent to the development load. Preloading is to increase settlement rates for faster consolidation of the underlying soils. The surcharge fill

heights are dependent on the depth of clays, which is variable over the site. It is most likely also, that the preload process will be expedited by the installation of wick drains. Refer to Coffey Geotechnics Report GEOTSGTE20301AA-AI dated 15 November 2007 in **Appendix M**.

Geotechnical advice has been provided on the fill type, directing that granular material with particles not greater than 100mm diameter is preferred for use on the site. In particular, no ash is to be used for filling; due to its leachate potential. The fill to be used must be pH neutral, and will be screened for properties under the supervision of geotechnical engineers, prior to supply to the site. This will mitigate any potential impacts of runoff from the fill to the wetlands. Further conditions on the specification of the fill import material have been described in Coffey Geotechnics Report GEOTSGTE20301AA-AI dated 15 November 2007, included in this report as **Appendix M**.

During the Due Diligence assessment process, suitable fill sources were located as follows:

- Hard Rock Quarries
 - Boral Seaham.
 - Hunter Quarries.
 - Hanson Quarries.
- Sands
 - Toll Sands.
 - Anna Bay Sands.
- Mine Overburden.

All sources are subject to geotechnical approval for use, prior to commencement of fill operations. This is not an exhaustive list, being determined for the purpose of Due Diligence only.

7.7 ACID SULPHATE SOILS & CONTAMINATION

7.7.1 Acid Sulphate Soils

Acid Sulphate Soils (ASS) are soils which contain high concentrations of pyrite, which, in the presence of sufficient moisture, oxidises, resulting in the generation of sulphuric acid.

Unoxidised pyritic soils are referred to as potential ASS. When the soils are exposed, the oxidation of pyrite occurs and sulphuric acids are generated, the soils are said to be actual ASS.

Pyritic soils typically form as waterlogged, saline sediments rich in iron and sulphate. Typically, the environments for the formation of these soils include tidal flats, salt marshes and mangrove swamps below about RL 5m AHD. They can also form as bottom sediments in coastal rivers and creeks.

Pyritic soils of concern on low lying NSW and coastal lands have mostly formed in the Holocene period, (ie: 10,000 years ago) predominantly in the 7,000 years since the last rise in sea level. It is generally considered that pyritic soils which formed prior to the Holocene period (ie: >10,000 years ago) would already have oxidised and leached during periods of low sea level during ice ages, which exposed pyritic coastal sediments to oxygen.

Disturbance, or poorly managed development and use of acid sulphate soils can generate significant amounts of sulphuric acid, which can lower soil and water pH to extreme levels (generally <4) and produce acid salts, resulting in high salinity.

The low pH, high salinity soils can reduce or altogether preclude vegetation growth, and can produce aggressive soil conditions which may be detrimental to concrete and steel components of structures, foundations, pipelines and other engineering works.

Generation of the acid conditions often releases aluminium, iron and other naturally occurring elements from the otherwise stable soil matrices. High concentrations of some such elements, coupled with low pH and alterations to salinity can be detrimental to aquatic life. In severe cases, affected waters can have a detrimental effect on further aquatic ecosystems.

Reference to the Acid Sulphate Soils Risk Map for Beresfield/Williamtown indicates that the site is located near the boundary between an area where there is a low probability of occurrence of acid sulphate soil materials greater than 3 m below the ground surface, and an area where there is a high probability of acid sulphate soil materials between 1m and 3m below the ground surface.

Coffey Geotechnics have conducted screening test for Stage 1 and the results are contained within their report attached at **Appendix M**. The following conclusions have been reached:

“Based on the results of screening tests and SCR Suite analysis presented in Appendix B, it is considered that the majority of alluvial soils encountered below about RL 1.5m

AHD are potential acid sulphate soils, and aeolian sands encountered above the proposed site finished level of about RL 2.5m AHD are not actual or potential ASS.”

The results are considered typical for the locality and the same conclusions can be drawn relative to the land for industrial subdivision.

As previously advised the significant depth of fill proposed in order to provide a development above the flood level will leave the soils that are likely to contain acid sulphate relatively undisturbed, with the exception of potential service trenching. In this situation it will be necessary to treat the soils in accordance with the advice of a geotechnical engineer, and it may be necessary to have prepared an acid sulphate soils management plan.

The methods for treating acid sulphate soils are well understood, and it is not expected that their presence will be a significant problem to the development of the site.

7.7.2 Contamination

Coffey Geotechnics have also carried out a Preliminary Site Contamination Assessment in respect of the whole site, and a copy of their report is attached at **Appendix N**.

The following site history is from the Coffey report.

- Based on aerial photographs and title records, it is considered that the four lots were most likely used for residential/agricultural purposes between the late 1800's and the 1970's. The nature of the agricultural use of the land is not clear, however there is some evidence of crops in the aerial photographs viewed during this period. Anecdotal evidence from a local resident indicates that the properties have previously been used for turf farming.
- Historic title information indicates that portions of the site were owned by Tomago Aluminium for a number of years between 1983 and 2003. Aerial Photographs do not indicate that any large scale industrial works were undertaken at the site during this period. Anecdotal evidence from a local resident indicates that the properties were used by Tomago Aluminium as a buffer zone.
- Historic title information indicates that portions of the site were owned by a private landholder with an occupation listed as service station proprietor. No evidence of a service station ever having operated at the site was identified in the Workcover NSW Dangerous Goods records, aerial photographs or a walk over of the site.

- Fill material of an unknown source and contamination status was observed to the south east of Lot 1 DP 597372, as well as within an unsealed roadway running through Lot 1 DP 1003492.
- Potentially fibre cement containing asbestos material was observed in the vicinity of an abandoned shed located within the north western corner of Lot 1 DP 1003492, as well as within the vicinity of a former building located upon the peak of the sand dune within the northern corner of Lot 161 DP 774440 (this is within the stage 1 area and an approved asbestos remover has collected and disposed of the material from the peak).
- The NSW DECC has no notices for any of the properties comprising the site or the surrounding properties under the Contaminated Land Management Act (1997).
- The site is within 2km of the Tomago Aluminium Smelter, and as such the site may have been subject to contamination associated with atmospheric fallout from the smelter, given that the prevailing wind is frequently from the smelter towards the site.

In consideration of the above Coffey's advise the following:

The site history review revealed that contamination could potentially have been introduced to the site through:

- Atmospheric fallout of contamination from nearby Tomago Aluminium Smelter;
- Importation of contaminated fill material;
- Leaching or weathering of zinc, lead or asbestos from current/former buildings and structures; and
- Application of pesticides during use for agricultural purposes.

Sampling and laboratory analysis were undertaken to make a preliminary assessment of the presence of soil contamination associated with the potential contaminating sources.

Based on the findings of the investigation presented above, the following conclusions are made:

- The potential for widespread soil contamination associated with atmospheric fallout from the nearby Tomago Aluminium Smelter to be present at the site is low;
- The potential for widespread contamination, at concentrations exceeding the site investigation criteria, to be present in fill material

at the site is low. However, it is noted that the number of samples collected relative to the volume of fill observed to be present at the site is low, and as such the potential for contaminated fill material to be present at the site cannot be precluded;

- Asbestos cement fragments were found in surface soils in the vicinity of an abandoned shed located in the north western portion of Lot 1 DP1003492 (numerous fragments) as well as in the vicinity of a former building located upon the peak of the dune in the northern portion of Lot 161 DP 774444 (one fragment). Asbestos fibres were not detected in soil samples collected near where the asbestos cement fragments were found. With the exception of the identified asbestos contamination, the potential for widespread contamination, associated with the weathering of building materials, to be present at the site is low; and
- The potential for widespread soil contamination, associated with the application of pesticides, to be present at the site is low.

7.8 ACOUSTIC

As previously outlined, the subject site is well-located for industrial development, being separated from any significant residential areas and within proximity of existing industry.

There are, however, a number of residences located on large rural lots adjoining to the east, and a small number of dwellings to the north, that require consideration in terms of potential from noise impacts associated with the proposed development. Potential impact on fauna within the wetland should also be considered.

An acoustic assessment of the proposed development has been undertaken by Spectrum Acoustics, addressing the potential impacts, and a copy of the report is attached at **Appendix O**. The detailed analysis has measured existing background noise levels and determined noise outputs for the proposed development. The report concludes that the proposed development will have no significant adverse impact. The report recommends the inclusion of a 3.5 metre high acoustic fence located at the north east corner of the site. The fence is required to allow night time operations within the rear yard of the site without adverse impact to the neighbouring property.

Potential impact on fauna within the wetland has been addressed under Section 7.2 of this report.

Construction and land-filling operations have also been considered as part of the analysis, and it has been determined that the likely noise impacts are within acceptable limits.

Assessment of acoustic impacts from specific future occupants of lots within the proposed industrial subdivision will have to be undertaken at the appropriate time, when development applications are submitted. Notwithstanding this, the acoustic report has considered the likely noise emissions from these future stages in general terms, and determined that the proposed development of the site for industry is not an inappropriate use.

7.9 AIR QUALITY

The proposed development is not a heavy polluting industry and does not require a licence from the Department of Environment & Climate Change.

Emissions or potential emissions to air have been identified and are discussed hereunder.

Vehicle & Machinery

Emissions to air from vehicles and machinery will comply with the relevant vehicle standards. The finished site topography will ensure that no excessive engine use is required. All vehicles and machinery will be regularly maintained to ensure proper and efficient working order and thereby minimise emissions.

Given the large nature of the development site, the large distances to nearest dwellings, and the lack of dense residential areas it is considered that there will be no perceptible air quality impacts to adjoining properties.

Paint Shop

Any necessary painting of machinery will be carried out within the proposed spray booth, as shown on the submitted plans. WesTrac has experience with the operation of such booths, and they will be designed to meet relevant standards and to comply with Workcover requirements. Accordingly no unacceptable emission to air will result from painting operations.

Dust

The proposed development has the potential for dust emission during the construction phase, and also from site operations.

Dust can be controlled during the construction phase through implementation of appropriate management measures. Filling operations will involve the use of larger or heavier types of material, thus minimising the opportunity for smaller particulates to be carried by wind. Dust control measures will be established through a comprehensive

construction management plan that would be prepared prior to construction activity. Measures are expected to include the following:

- Covering of loads where required;
- Amending of operations under excessive wind conditions including ceasing of operations if required;
- Use of water tankers as required, to control dust;
- Rehabilitation through vegetation of surfaces to be left unsealed; and
- Truck wheel washes or other dust removal measures.

When the proposed WesTrac facility is established, dust will be controlled by ensuring that all service areas are sealed, or as a minimum treatment, covered with gravel, leaving no exposed material that can be carried by wind. Dirt tracked onto access routes will be cleaned away as soon as practicable. Vehicles will be regularly washed. Customer's machinery brought to site will in most circumstances be cleaned of excess dirt or dust prior to any work being undertaken on it.

In conclusion, given the nature of the proposal, the minimal sources of potential air emissions, and the controls that will be installed and implemented following a detailed management plan, it is considered that no adverse impacts will result.

7.10 HERITAGE AND ARCHAEOLOGY

The site is vacant, contains no listed heritage items, and is not located in a heritage conservation area. Preliminary investigation of the land title is consistent with the fact that there is no heritage listing, determining no matters of likely heritage significance.

A detailed archaeological survey (Aboriginal) of the site has been conducted by Indigenous Outcomes, and relics were found within the sand escarpment running along the front of the site, adjacent to Tomago Road. As part of the investigation a Section 87 permit to dig was obtained to ensure a thorough examination of the site. The primary purpose of the dig was to determine if the site has been used as a burial ground. It was established that this was not the case.

Full copies of the two reports prepared by Indigenous Outcomes are located at **Appendix P**. The first report, dated March 2006, communicates the location of relics on site, and rates the site as being of high cultural significance, on the premises that it may be a burial ground. However, further investigation, following the obtaining of a Section 87 permit, was completed in October 2006. The October report concludes that the find does not contribute in any significant manner to the understanding of

aboriginal culture, and that it is unlikely the site was ever used as a burial ground. The recommendation of the report is that the LALC be given the opportunity to collect the relics from the site prior to development. As part of the work carried out by Indigenous Outcomes, the LALC were fully consulted and involved in the field surveys. The LALC have provided a letter of agreement to this outcome, and this is also included at **Appendix P**. Redlake Enterprises intends to conform with the recommendations of the report.

7.11 STORMWATER, WATER QUALITY AND REUSE INCLUDING WASHBAY

The stormwater management system for both the WesTrac facility and the industrial subdivision have been designed to achieve a 'no impact' objective, and to acknowledge and incorporate the requirements of DGRs, Hunter Water Corporation (HWC) requirements, the series of Department of Environment and Conservation NSW (DECC) stormwater manuals and Council's development control plans. Included in the development of the system were an assessment of water quality, and the quantity and volume of stormwater runoff discharging to the downstream receiving waters, both pre, and post, development.

The stormwater management system for the WesTrac facility is described in Volume 3 of **Appendix F**. With knowledge gained from water reuse at existing sites, an in-house water balance model was established to track the water balance of operations through the WesTrac facility. The model was simulated on a daily time-step basis, over a 30 year period, using Williamstown rainfall and evaporation data. The analysis period included the driest and wettest years of rainfall on record for Williamstown. The average yearly rainfall for the analysis period was equivalent to the long term average for Williamstown. The results of the water balance modelling indicate that with between 1-5ML of rainwater tank storage, water recycling and reuse to levels of between 82.5% and 99.2% respectively, can be achieved.

HWC required that the stormwater management system acknowledge the Special Area, connected to the Tomago Sandbed groundwater reserves. The water balance model was used to demonstrate no negative impact on recharge volumes to the aquifer system and in fact a slight positive impact was demonstrated. That is, groundwater recharge would be increased following development.

The water balance model was used to track stormwater runoff volumes to the wetlands downstream over the 30 year analysis period. The model indicated occurrence of runoff volumes to the wetland pre and post development for demonstration of 'no impact'. Further analysis also revealed consistency of volumes, on a yearly basis through wet and dry periods, for pre and post development simulations.

A MUSIC model was established to verify the quality of the runoff to the wetlands for 'no impact', post development. The pollutant levels in runoff were measured for the catchment as an existing, pre European settlement catchment and used as target objectives for the pollutant levels post development. This is a significantly high level of protection from runoff pollutants to the wetlands downstream, exceeding DECC target levels. A treatment train of gross pollutant trap, swale and constructed wetland was sized to meet the target objective, verified with MUSIC. The Treatment Train Effectiveness from the simulation indicated pollutant removal levels for TSS, TP and TN of 99.8%, 98.7% and 96.5% respectively. By comparison, DECC required TSS - 85%, TP-65% and TN-45%.

The stormwater management system for the industrial subdivision is described in Volume 4 of **Appendix F**. Based on the subdivision layout by Asquith & de Witt, there are three (3) basin locations for constructed wetlands. Modelling for water quality, quantity and reuse was on the basis of 95% imperviousness of the lots.

MUSIC was used to model water quality, volumes and reuse. Similarly, to the MUSIC model of stormwater from the WesTrac site, the pollutant levels in runoff were measured for the catchment as an existing, pre European settlement catchment and used as target objectives for the pollutant levels post development. This is a significantly high level of protection from runoff pollutants to the wetlands downstream, exceeding DECC target levels. A treatment train of rainwater tanks with reuse, gross pollutant traps, swales and constructed wetlands were sized to meet the target objective, verified with MUSIC. The Treatment Train Effectiveness from the simulation indicated pollutant removal levels for TSS, TP and TN of 99.8%, 98.7% and 98.3% respectively. By comparison, DECC required TSS - 85%, TP-65% and TN-45%. The post development flow volumes of 42.4ML/year from the site were also shown to be close by comparison to existing flow volumes of 49.5ML/year.

Peak flows for the development were modeled using XP-RAFTS. Modelling was undertaken for matching post development peak flows to pre development peak flow levels for the standard design storm recurrence intervals of 1, 2, 5, 10, 20, 50, 100 year storm events. Modelling indicated that detention volumes of 14,334m³, 17,362m³ and 8,975m³ are required for the three (3) basins respectively to attenuate post development peak flows to pre development levels.

It has been demonstrated in this report that the stormwater management system for the WesTrac facility and Industrial Subdivision has achieved the target objective of 'no impact', exceeding the requirements outlined in the current DECC stormwater manuals and Council's development control plans. The stormwater management system also meets the requirements of DGRs and HWC correspondence to date.

Two washbays are proposed for the site, and all vehicles and parts requiring washing will be taken to one of these, no washing outside of these bays will occur. All water from the washbays will be recycled a number of times before having to be discharged to sewer. Washbays will be supplied by with water harvested on site. A waste oil separator will be installed to each bay and solid waste will be discharged to an approved facility.

7.12 SOIL WATER MANAGEMENT

Erosion and sediment controls, described in a Soil and Water Management Plan, are necessary during construction for the protection of receiving waters downstream. Erosion and sediment control measures are temporary, and are required during filling operations, and until such time as building and construction areas are landscaped, revegetated and sealed. Soil and Water Management for the WesTrac facility and the industrial subdivision are described in Volumes 3 and 4 respectively of **Appendix F**.

Initially, the constructed wetlands to be established post development, subject to staging, will be formed for use as sediment collection dams. The first stage will be the site preparation for the WesTrac facility, a land parcel occupying approximately 23 hectares. The remainder of the industrial subdivision will be staged dependent on market demands.

To be conservative, a higher criteria level of protection has been adopted for the design sizing of the sediment basins for the site, reflecting the sensitivity of the receiving waters downstream. "Managing Urban Stormwater: Mines and Quarries - Consultation Draft 2007" (DECC) was referenced due to the scale of the site works. The 90th percentile rainfall event is the standard for mines and quarries. It is also described that 2-5 day rainfall events are suitable criteria for well managed sites in which prompt action can be guaranteed. At this site the 95th percentile, 5 day rainfall event has been selected, which is approximately 3 times the storage volume of that generated by using the 75th percentile, 5 day rainfall event typically used for development sites. This gives the basin an increased capacity, capturing runoff from a greater number of storm events. This minimises the potential risk of sediment laden water leaving the site and discharging to the wetlands downstream during construction.

Further details of the layout of sediment dams and soil and water management will be determined during the detailed design phase, in conjunction with the bulk earthworks strategy.

7.13 HAZARDS (SEPP 33)

A Threshold Screening Analysis has been undertaken by Barry Eadie Consulting in accordance with the guidelines Applying SEPP 33 the

purpose of which was to determine if the proposed development was considered to be potentially hazardous. Potentially hazardous development requires, under the policy, the preparation of a preliminary hazard analysis.

A copy of the report by Barry Eadie Consulting is located at **Appendix Q** concludes that the proposed development is not potentially hazardous.

All hazardous goods proposed to be stored on site will be stored in accordance with Workcover requirements.

7.14 SEWERAGE DISPOSAL

There is currently no sewer available to the site. Liaison with Hunter Water Corporation in this regard has commenced, including a meeting between interested parties to deliberate joint share arrangements for connection and upgrade of the existing infrastructure.

Cost benefit analysis indicates that a proprietary product will be used for sewerage treatment on-site. It is understood from HWC requirements that on-site treatment relying on transpiration beds, etc is not permitted, due to quality of effluent disposal, and risk of contamination by effluent of the water reserves in the Tomago Sandbeds. On-site treatment at the site for development is differentiated from traditional methods by the use of a Membrane Bioreactor Sewage Treatment System, capable of producing water quality that is equivalent to, or better than the quality of stormwater runoff from the facility, in accordance with the Guidelines for Disposal set down by the NSW Department of Health. Furthermore, the sewerage treatment facility is located a significant distance (approximately 320 metres) downstream of the Tomago Sandbeds Special Area, so as to avoid risk of potential contamination at the collection point. Full details are described in **Volume 3 of Appendix F**.

The Water Industry Competition Bill 2006 indicates that a privately developed treatment system is permissible. This is the necessary option for the WesTrac facility, due to the timeframes within which WesTrac need the facility to be operational. It is accepted that HWC is currently reviewing overall sewer strategies for the industrial development of the Tomago area. This review will most likely be applicable to the timing of treatment for the industrial development adjacent to the proposed WesTrac facility, however, sewerage treatment provisions will be required for WesTrac prior to HWC determining the strategy for the area. Full details are described in **Volume 3 of Appendix F**.

As a minimum, the unit will be a temporary measure servicing the WesTrac facility until sewer strategy planning by HWC is complete. Alternatively, additional package units can be added to the on-site treatment package plant for later stages of the industrial subdivision if required.

The proposed plant is a membrane bioreactor design, comprising a combination of sequential batch reactors and submerged membrane treatment. The system was selected for its stability in on-site conditions and for its compact footprint. With sequential processing and final membrane filtration a very high quality effluent is produced.

The plant can be controlled remotely, and will have a SCADA system compatible with control telemetry. In addition, all the key equipment can be manually operated from the main control panel. Primary disinfection is achieved by the membrane, and the deployment of secondary disinfection (UV), and tertiary chlorination, results in a very low bacterial content in the treated effluent. The plant will have on-line monitoring of turbidity, pH and disinfection efficiency, and will employ suitable remote alarm systems. The plant will be part of an onsite Environmental Management Program. There will be a comprehensive Operating Manual, and on-going training for operators. Typical effluent quality from the plant is shown in the Table below.

Treated Effluent (Econova) Quality

Parameter	Treated Effluent (1)
pH	7.25
Suspended Solids	<2
BOD	<3
Ammonia	0.02
Nitrate	0.43
Total Nitrogen	1.3
Total Phosphorus	0.27
Turbidity	0.78
E Coli cfu/100ml	<1
Faecal Coli cfu/100ml	0

Notes: all mg/l except pH

(1) Treated Effluent Source provided by Econova from Noosa North STP lab Caboolture Scientific Services Moayfield QLD

From the above table, the Econova system can be seen to treat and produce discharge with very low bacterial results, by the use of membrane technology. Site design is such that the discharge from the sewerage treatment facility will enter a swale for conveyance to a constructed wetland for further polishing prior to discharge to the receiving waters downstream. Despite the proven quality of discharge, any potential risk of contamination to the Special Area has been further mitigated by careful design of the perimeter drainage. Infiltration recharge areas to the Special Area are separated from the swale drainage by flowpath conveyance at a lower elevation. An embankment, 1m high, has been designed to a level that will not permit any backwater effects

from the swale discharge or the spillway levels of the constructed wetland to enter the infiltration area. Refer to **Volume 3 of Appendix F**.

7.15 WASTE MANAGEMENT

The following table is a summary of the waste likely to be generated by the facility, and the storage and disposal methods for processing this. It is WesTrac's standard practice to seek the opportunity to recycle rather than dispose. All waste for disposal or for recycling is processed by approved contractors.

Waste	Storage Location	Disposal Method
Wood / Timber (pallets, wood blocks)	Collected in recycling area for removal	Collected in recycling area for removal off site
Oiled rags	Collected in dedicated identified bins within the workshops	Removed by same licensed contractor as waste oil and disposed of at approved facility
Coolant	Circulated to waste coolant collection tank	Removed by a Licensed contractor to a approved facility
Paper	Collected in various recycling areas around the site	Removed by a Licensed contractor to a approved facility
Cardboard	Collected in various recycling areas around the site	Removed by a Licensed contractor to a approved facility
Scrap Steel	Stored in fabrication shop	Removed from site by scrap metal merchant
Scrap Aluminium	Stored in fabrication shop	Removed from site by scrap metal merchant
Scrap Brass	Stored in fabrication shop	Removed from site by scrap metal merchant
Rubber tyres	Stored in inventory attachment area	Removed from site by tyre handler to approved disposal facility
Rubber drive belts	Stored in inventory attachment area	Removed from site by tyre handler to approved disposal facility
Cleaning Rags	General waste bins	Normal rubbish removal
Waste oil	Circulated to waste oil collection tank	Removed by a Licensed contractor to a approved facility
Oil filters	Collected in waste oil area	Removed by same licensed contractor as waste oil and disposed of at approved facility
Used Batteries	Bunded storage area awaiting pick up	Removed by a Licensed contractor to a approved facility
General waste	General waste bins	Normal rubbish removal
Paint	Stored behind paint shop in approved flammable cupboard	Removed by a Licensed contractor to a approved facility
Plastic wrap	General waste bins	Normal rubbish removal
Food Waste	Cafeteria garbage	Normal rubbish removal
Air conditioning gas	Recovered using approve A/C equipment stored with empty gas cylinders	Exchanged with licensed contractor

Sewerage (this is addressed under a separate heading above in this report).

Washbay waste including oil and solids (this is addressed under a separate heading above in this report.)

7.16 SOCIAL & ECONOMIC

The proposed stage 1 development is expected to generate some 400 -

600 construction jobs and the WesTrac NSW ACT headquarters to employ some 400 full time staff once operational. This is a significant employment contribution to the region, and is consistent with the Lower Hunter Regional Strategy to attract employment-generating development to the area, and specifically to this site.

The following addresses more specific social aspects of the proposed development.

Access & Mobility

The proposed development will comply with the requirements of the Building Code of Australia in terms of access and mobility.

Accommodation & Housing

The proposal will not result in a loss of low-moderate rental housing stock, as it does not involve the demolition of existing housing stock. Rents are not likely to increase as a result of the proposed development.

No special accommodation needs are likely to be required for any temporary workforce associated with the development.

Community Services and Facilities

The proposed development will not require any specific on-site community facilities or support services.

Community Structure

The development will not decrease the community's capacity to act cooperatively and will not cause divisions within the community.

The proposal does not physically separate one part of a community from another.

Crime & Public Safety

The proposed development is not a high-risk development requiring extensive measures to be incorporated to provide security to the occupants of the building outside of the common-sense practice of: incorporating appropriate lighting of communal spaces and carparks; design that allows for casual surveillance; and appropriate consideration of landscape design. The proposed development incorporates these design considerations.

The proposed 24 hour operation of the WesTrac facilities will provide a significant level of site security, and will contribute to security within the locality generally.

Interaction between New Development and Existing Community

The proposed development will be consistent with the established industrial area, and will not detract from any densely populated residential area.

Needs of Social Groups

The gender mix of the population will not be affected by the proposed development.

The proposed development requires no additional services primarily affecting women.

No special-needs group will need to be catered for as a result of the proposed development.

Recreation Facilities

No recreation area or facility will be lost as a result of the proposed development, and no change in quality of existing recreation areas or facilities will result. No additional demand on existing facilities will result from the proposed development.

The proposed development provides a high level of amenity for workers through the provision of a well-equipped cafeteria.

Social Equity

It is not expected that the proposed development will assist any specific disadvantaged social group. At the same time it is not expected that the proposed development will disadvantage any social group.

No existing residents will be displaced.

Investment

The proposed development will make a significant contribution through investment dollars to the local economy in the short, medium and long terms. The future development of the proposed industrial subdivision will provide ongoing opportunity for investment for some years to come.