ENVIRONMENTAL ASSESSMENT KEY ISSUES

7.1 Flooding

7.1.1 Impact of Flooding

The Post Development Flood Modelling Report (Appendix 10) includes information on the second stage modelling which was undertaken to quantify flood behaviour in Macquarie Rivulet adjacent to Albion Park Airport between the Princes Highway Road Bridge and Albion Park village. This modelling involved adjustments to the existing hydrodynamic model to reflect the proposed changes as a result of the proposed development and determination of flood levels and hazard levels within and/or adjacent to the site in a 100 year Average Recurrence Interval (ARI) and "Probable Maximum" design flood.

In a 1% AEP flood event, floodwater would be at about RL 6.6m AHD adjacent to the western perimeter of the development, rising to about RL 8.2m AHD in a PMF event. In a 1%AEP flood, all land part of the proposed subdivision would be above flood level. In a PMF event, flood water would inundate the lower (central) portion of the proposed development, south of the east-west runway. At the peak of a PMF event, floodwater would reach 1.1m depth in the sag near the intersection of the western and northern access roads and 0.4m depth in the sag of the eastern access road. Peak velocities in the inundated area of the site in a PMF event are very low (<0.01m/sec). Peak velocities adjacent to the site in a 1%AEP event are low, being generally less than 0.5m/sec except in the vicinity of the realigned creek below Tongarra Road, where instream velocities reach 1.1m/sec. Flood impacts are generally not apparent at the 0.5m or m/sec scale used in plots of flood behaviour. Differential plots at an 0.02m (20mm) contour resolution are required to visualise these impacts. Plots at this resolution confirm that the proposed development would generally increase flood levels on the lower floodplain of Macquarie Rivulet (from the Princes Highway up to the line of the east-west runway) by about 33mm in a 1%AEP event and 21mm in a PMF event. Flood levels adjacent to the site and in the vicinity of the north eastern edge of the Albion park village would be increased by about 50mm in a 1%AEP event and 30mm in a PMF event.

The flood modelling reports and analysis considered the 100 year (1%) and the PMF floods for the site for both the pre-developed or existing conditions and the post development condition. The full range of floods, such as the 5% and 10% floods, were not considered as the development site is above the 100 year (1%) flood level.

In relation to the safety of the users of the development, there are no problems in the event of floods up to and including the 100 year (1%) as the site is above the 6.6 AHD flood level. In the PMF and floods larger than the 100 year, the central part of the site would be inundated to a level of 8.2 AHD. If this extreme event of the PMF were to occur it is considered that there are adequate escape routes all around the site. The site is in an open flat area and no residential development is proposed. The site is extremely easy to access and egress should such an event occur.

7.1.2 Impacts on the Wider Area

An assessment of the distribution of provisional hydraulic hazard across the study area is included in the Post Development Flood Report (Appendix 10). The plotted provisional hazard categories are based on the most severe hazard category (based on the consideration of instantaneous velocity and depth), occurring throughout the event. The relatively pronounced ground slopes at the edge of the floodplain adjacent to the proposed development site prevents the development of a zone of low and/or transitional hazard of any significance, land to the west of the development being of high provisional hydraulic hazard close to where it abuts the site. The site itself, being above the level of flooding in a 1% AEP event is not subject to any level of hydraulic hazard from flooding in such an event. A tongue of mostly transitional to low provisional hydraulic hazard floodwater would penetrate the northern half of the proposed development to the south of the east-west runway, along the valley created in the surface by the proposed earthworks. Velocities are near zero throughout this zone of inundation and range in depth at the peak from 0.4m where they cross the eastern access road to 1.1m depth where they cross the sag in the western access road. Most of the proposed development north of the east-west runway would be inundated in such an event. Peak flood depth in the development on Lot 6 north of runway would range from zero to about 1.2m, cutting off road access to the development on Lot B. Only the northern corner of Lot B would be inundated in

such an event, flooding in the area of inundation being shallow in depth and of very low velocity. Access to and from Tongarra Road is not altered by the proposed development, the intersection between the proposed access road and Tongarra Road remains above the level of PMF flooding.

The Post Development Flood Report found that the proposed development will have a minimal impact on flood behaviour and this will only occur off the site. These impacts, which would only occur in the 100 year (1%) event, amount to a raising of the flood level in the northern part of the flood plain of between 32 to 34 mm and a change in level in the southern part of the catchment around the edges of the area of between 40 to 60 mm. No residences are affected in the 1% flood event in the village as the impacts would not raise the flood level above existing floor levels. The Roads & Traffic Authority and Shellharbour Council have been consulted to determine whether there possibly could be any impact on existing or planned development. No impacts have been found to date. It is understood that the RTA proposals in relation to the adjacent land will not have any serious impact on flood levels, however planning of this work is only at the conceptual stage and detailed information is not available to assess likely impacts.

7.1.3 Hazard, Access and Evacuation Issues

The provisional hydraulic hazard for the pre and post development models has been mapped and is included in the Flood Reports in Appendix 10. Flood hazard during the 1% flood adjacent to the site is unchanged although the amount of low hazard area has been reduced due the steepening of the banks of the development site. A low hazard area has been introduced to the central part of the site during the PMF but the high hazard area has been reduced to the filling of the site. The design floods for the site for the PMF and 1% are for very long duration events giving ample time for flood warning. There are ample escape routes from the site and higher ground is available for evacuation purposes. As a result it is considered that evacuation issues in relation to the development are negligible.

7.1.4 Strategies to Manage Adverse Impacts

The proposed development has not been found to cause any unmanageable impacts on flood behaviour. The existing development in the area, especially the new residential developments, have been constructed with floor levels well above the flood levels demonstrated in these flood studies. These levels were obtained from unrealistic flood heights produced in previous studies. On the site itself all buildings will be constructed above the flood level and a minimum floor level of AHD 7.1 has been adopted for all buildings on the site.

7.1.5 Consistency with the Aims and Intent of the Floodplain Development Manual 2005

The Flooding Studies which are included in Appendix 10 have been prepared on the basis of the requirements of the Floodplain Development Manual and have shown that there will not be any significant adverse impacts from the development of this site on the flood behaviour in the vicinity of the site. One of the primary objectives of the New South Wales Flood Prone Land Policy, recognises the following two important facts:

- Flood prone land is a valuable resource that should not be sterilised by unnecessarily precluding its development; and
- If all development applications and proposals for rezoning of flood prone land are assessed according to rigid and prescriptive criteria, some appropriate proposals may be unreasonably disallowed or restricted, and equally, quite inappropriate proposals may be approved.

The proposal is entirely in accordance with the Floodplain Development Manual 2005 and the relevant local policies. This land which the subject of this development proposal is very valuable land with great economic potential.

7.2 Biodiversity

7.2.1 Impact on Existing Flora and Fauna

The proposed development on the site will involve the re-modelling of the landform of the Business Park area of the site and the subsequent construction of buildings and associated development.

The initial subdivision works will include:

- extensive earthworks within the Business Park footprint involving the excavation and relocation of material from more elevated parts of the site, and the importation and placement of fill material within the flood-prone lands;
- the construction of batter slopes from the business park footprint to the existing ground level, and their subsequent planting in accordance with the Vegetation Management Plan (VMP) for the project;

- the installation of relevant services and infrastructure including the service road, services (power, telecommunications, sewer, water and gas) and the provision of perimeter fencing;

- implementation of the Landscape Plan for the development footprint portion of the subject site; and

- implementation of the initial phase of the VMP for the project.

Approximately 26.58ha of the site is to be retained in an undeveloped condition following the industrial subdivision works and subsequent development of the site. Most of the area to be retained is located in the western part of the site, and includes Frazers Creek and the two wetlands on the site. Physical disturbance to this area of the site will be avoided except that there is the requirement to replace a loop of Frazers Creek in the southwestern parts of the subject site with a shorter stretch of artificial (quasi-natural) channel, which is to be rehabilitated in accordance with the VMP for riparian vegetation purposes

Implementation of the VMP for the non-developed portion of the site is intended and designed specifically to provide a substantial benefit in the rehabilitation of the wetlands and the riparian corridor which traverses the site in a northerly direction.

In its current condition, Frazers Creek has relatively little environmental value because of the extent and intensity of previous clearing and the ongoing agricultural activity. Whilst the wetlands on the site have somewhat greater environmental value, they are also affected adversely by existing agricultural practices (including pasture improvement and ongoing grazing). Development of the site as proposed will facilitate the rehabilitation of those areas and the ongoing maintenance of natural vegetation and the newly created habitats on the site.

The proposed development also involves the retention of part of the stand of paperbark swamp forest in the southeastern corner of the site. Approximately half of that stand of vegetation is to be retained, and the area lost will be offset by the creation of additional areas of paperbark swamp forest within the riparian corridor along Frazers Creek in the western parts of the site.

In general terms, therefore, the proposed development of the site will involve:

- the conversion of existing agricultural and highly disturbed land to Business Park development land;

- the loss of approximately 0.5ha of modified paperbark swamp forest in the southeastern corner of the site (noting that this an example of an "endangered ecological community") and its replacement by additional areas of paperbark swamp forest within the Environmental Management Zone along Frazers Creek to the north;

- the replacement of a loop of Frazers Creek (which is in part at least modified by previous earthworks activities) by a shorter stretch of watercourse, and rehabilitation of that portion of Frazers Creek;

- the replacement of existing agricultural and degraded land with rehabilitated native vegetation and habitats; and

- the undertaking of a substantial riparian and wetland rehabilitation program along Frazers Creek and within and around the wetlands on the site.

The proposed development of the site will facilitate the implementation of a significant environmental management and rehabilitation program particularly along Frazers Creek and around the wetlands on the site. The environmental benefits which will be derived from the project as currently proposed, including the SEPP 14 wetland, substantially outweigh the adverse impacts which will be imposed as a result of the proposed subdivision and development of the site.

The direct adverse effects of the development as currently proposed on the 'natural environment' would include:

- the removal of approximately half of the paperbark swamp forest in the southeastern corner of the subject site;

- the removal of a loop of Frazers Creek and its replacement by a shorter length of watercourse (noting the highly degraded and modified condition of that portion of Frazers Creek);

Conversely, the proposed development incorporates:

- replacement of the approximately 0.5ha of

paperbark swamp forest with plantings of that community within the riparian buffer on the subject site (utilising vegetation removed from the southeastern corner of the site);

- the removal of cattle and other adverse agricultural practices from the wetlands and Frazers Creek;
- complementary planting of earthworks on the development area adjacent to the wetlands to provide a vegetative buffer and associated plantings;
- the creation of a total of 11.95ha rehabilitated and managed land on the site specifically for biodiversity conservation purposes; and
- the implementation of a long-term management regime to ensure permanent enhancement of the environmental circumstances on the site.

The proposed development incorporates appropriate measures including Water Sensitive Urban Design principles, as well as the rehabilitation of a substantial area of the site. The stormwater and water quality control system designed for the site is specifically intended to avoid the discharge of contaminated waters or sediment into Frazers Creek and to appropriately control water discharges into the wetlands on the site.

The proposed development will involve a net environmental benefit for the wetlands, watercourses and other habitats on the subject site at Albion Park, and for habitats and environments downstream including Lake Illawarra.

7.2.2 Threatened Species

The site supports two "endangered ecological communities":

- the FWCF community which is represented by the two wetlands on the subject site and probably parts of the modified channel of Frazers Creek where water flows are slow (particularly adjacent to the SEPP 14 wetland); and
- the SSFCF community, which is represented by the small stand of paperbark swamp forest in the southeastern corner of the site.

In terms of the relevant factors of section 5A (s.5A) of the EP&A Act, the proposed development of the subject site is not considered "likely" to impose a "significant effect" on these "endangered ecological communities" because:

- approximately half of the SSFCF community in the southeast of the site is to be retained and managed in perpetuity for biodiversity conservation purposes. Whilst the remaining half of the community is to be removed, the protection and enhancement of the remnant will ensure the long-term survival of that community on the subject site. Thus, the "local occurrence" of the community (even if restricted to the site itself) will not be placed at "risk of extinction" by the development as currently proposed;
- the stand of that community on the site is not regarded as of particular conservation value or significance given its small size, isolated location and limited value by comparison with other larger patches in the immediate vicinity;
- the vegetation from the area of SSFCF to be removed will be used within the Environmental Management Area on the site, to provide the basis for an alternative area of that community on the site;
- the SEPP wetland on the site is to be protected by appropriate plantings and management regimes, and will be enhanced by the removal of weeds and the cessation of grazing by cattle;

The wetland in the northern part of the site is to be retained in its current state. No threatened flora or fauna species have been recorded from the site, although a number of individuals of such species are likely to occur on the site on occasions at least. In particular, individuals of a range of threatened wetland and wading bird species could utilise the wetlands on the site under appropriate climatic circumstances or at appropriate times of the year (for migratory species). Additionally, individuals of a few other wide-ranging and highly mobile bird species could also utilise the site on occasions, although the habitats and resources present are currently of relatively little value for most such species (eg the Square-tailed Kite and Swift Parrot).

Several threatened microchiropteran bats are also likely to occur on the site, on occasions at least. Most of these species are highly mobile and wide-ranging, however, and many can utilise a range of wetland, grassland and open forest communities for foraging purposes. Some

species can utilise old buildings for shelter or roosting purposes, but there are no hollow-bearing trees present on the site for those species which require that feature for roosting purposes.

7.2.3 Indicative Habitat Corridor

The Illawarra Regional Strategy identifies habitat corridors through the Illawarra region including:

- "indicative DEC regional habitat corridors" along the escarpment and between Lake Illawarra and Macquarie Pass; and

- "other indicative habitat corridors", including one corridor indicated in part across the southwestern parts of the subject site at Albion Park.

The corridor mapping in the Illawarra Regional Strategy is not precise, but the "indicative habitat corridor" on the site appears to coincide approximately with Frazers Creek, in the southwestern parts of the subject site at Albion Park. It is to be noted that Frazers Creek is also identified as a "proposed riparian corridor in the city of Shellharbour" in the Nature Conservation Study Report prepared for Shellharbour City Council by Kevin Mills & Associates (KMA 2000).

The site does not comprise part of a major "habitat corridor" as identified in the Regional Strategy, but Frazers Creek is identified as an "other indicative habitat corridor" in the Regional Strategy.

The substantial rehabilitation and ongoing management program which constitutes a part of the proposed development of the site constitutes a significant and substantial contribution to the establishment and long-term maintenance of a "habitat corridor" along Frazers Creek. In its current form, Frazers Creek on the site and on lands to the immediate north has very little habitat value because of the substantial modifications to the watercourse and the removal, over a long period, of native vegetation along the watercourse. The "habitat corridor" value of Frazers Creek in its current condition is extremely marginal, and most native fauna and flora species would not currently use Frazers Creek as habitat or for movement purposes.

The regeneration of vegetation along Frazers Creek and the rehabilitation of habitats along this "corridor" will achieve the goals of the Illawarra Regional Strategy with respect to that "habitat corridor" (at least within the subject site itself). In addition, the stormwater management regime for the Business Park will contribute in a positive manner to the improvement of Lake Illawarra by strict controls on contaminant and nutrient discharges. Uncontrolled agricultural activities, on the other hand, have the potential to result in degradation of water quality within Lake Illawarra downstream of the Macquarie Rivulet outlet into the lake.

7.2.4 Impact Amelioration

The impact amelioration and environmental management measures which are included as part of the proposed development of the site at Tongarra Road, Albion Park consist of three main elements:

- specific activities designed to avoid adverse impacts during earthworks and construction activities on the site (particularly regarding the discharge of sediment, erosion of watercourses and/or the discharge of contaminents into the natural environment).

- the implementation of a water management regime on the industrial development site which controls stormwater flows and volumes, and which removes contaminants to ensure high water quality discharges from the developed part of the site; and

- the implementation of a comprehensive and substantial habitat regeneration and rehabilitation program along Frazers Creek and within wetlands on the site to facilitate the creation of a "habitat corridor", as well as within the retained area of swamp forest in the southeastern corner of the site. Management of that portion of the subject site will be ensured by the implementation of a Vegetation Management Plan (VMP) for the site.

With respect to the need to ameliorate adverse impacts from the subdivision and subsequent development of the site at, and with respect to the offsetting of the limited effects which will be imposed on the natural environment, it must be noted that the proposed development involves a substantial contribution to biodiversity conservation and the natural environment.

Essentially all of the site is currently highly modified by long-term agricultural activities, with most of the natural vegetation having long been cleared for grazing and horticultural purposes. The proposal for the site includes a bush regeneration and rehabilitation program. Further, management of the rehabilitated land on the site is to be

ensured in perpetuity by the implementation of a Deed of Agreement which binds future landowners within the Business Park to ongoing maintenance of the vegetation on the site.

The proposed development of the site at will provide a substantial net environmental benefit. The proposal will contribute in a positive manner to biodiversity conservation and the establishment and maintenance of habitat corridors or linkages through this landscape.

7.2.5 Impact on Waterways

7.2.5.1 Water Quality

The water quality objectives contained in the Lake Illawarra Strategic Plan have been adopted in the Water Cycle Management Plan adopted for the development of the site (Appendix 4 The stormwater management regime has been designed to achieve the stormwater goals as follows:

- total nitrogen 0.5 mg/L
- total phosphorous 0.05 mg/L
- filterable reactive phosphorous 0.02 mg/L
- total suspended solids 50 mg/L

The use of water quality control features on the individual lots and through the Business park will ensure that the stormwater discharged under median wet weather conditions will achieve the objectives of the Strategic Plan.

Erosion and sedimentation will be controlled by the impact amelioration and environmental management control measures which will be incorporated into the construction phase of the development and the future operation of the sites within the development. In addition, the substantial enhancement of Frazers Creek and its adjoining riparian lands will contribute to improvements in water quality conditions and flow regimes off the site.

Special attention has been paid to the potential for erosion of portions of Frazers Creek, and the proposal will provide additional filtration to and protection of water quality within the Creek both during earthworks and construction activities and during subsequent use of the site.

7.2.5.2 Aquatic Ecosystems

The two wetlands on the subject site provide habitat and resources for a range of native species, particularly wetland and wading bird species, some of which would also utilise portions of Frazers Creek (particularly where there are dense reeds and/or grassy banks). Native fauna species which have typically been recorded in these environments on the site include the Spur-winged Plover, Straw-necked Ibis, White-faced Heron, Great Egret, Purple Swamp Hen, Black-winged Stilt, Pectoral Sandpiper and Sharp-tailed Sandpiper.

It is highly likely that a range of other wetland and wading birds would utilise the wetland habitats on the site either at appropriate times of the year (for migratory species) or under appropriate conditions and circumstances (eg when the wetlands are flooded and there is a substantial body of standing water).

The improvement proposed to these areas as part of the development proposal will lead to an improvement and protection of the wetland habitats on the site.

7.3 Water Management

7.3.1 Impacts on Wetlands

The proposed development will contribute in a significant manner to achieving the objectives of the NSW State Rivers & Estuaries Policy. At present, Frazer's Creek (which traverses the site at Albion Park on its western side) and the two associated wetlands on the site are in a highly modified and degraded condition. These features of the environment have long been affected by agricultural activities and have been modified by extensive clearing of native vegetation, introduction of pasture grasses and other weed species, and long-term and ongoing cattle grazing. As a consequence, the natural functions of watercourses and their associated wetlands (including the trapping of nutrients, containment of sediment, protection against erosion and provision of habitat for native biota) have long been compromised on the site and in the landscape generally.

The proposed development includes a substantial rehabilitation program which concentrates on the riparian lands adjacent to Frazer's Creek and the wetlands on the site. That area will be contained within an Environmental Management Area (EMA) and a Riparian Buffer area which is to be rehabilitated according to a Vegetation Management Plan (VMP) (Appendix 6) prepared for the site.

Further, maintenance of the EMA in the long-term is to be guaranteed by establishment of deeds of agreement (or other appropriate legal mechanisms) to ensure that lot owners within the Business Park contribute in perpetuity to maintenance of the EMA.

The overall aim of the Lake Illawarra Estuary Management Study and Strategic Plan (LISP) with respect to water quality is to "improve the water quality of the Lake to a standard that protects its ecological, recreational and aesthetic values".

The specific objectives identified to achieve that aim include:

- WQ-1: reduce impacts of stormwater flows "by achieving the recommended water quality criteria .. in these discharges"; and
- WQ-3: to define "'sustainable' loads from the catchment to the Lake" to satisfy appropriate water quality criteria. The LISP provides an "initial set of recommendations in regard to criteria that may contribute to the achievement of sustainable loads".

The LISP identifies water quality objectives that are to "be applied to all future developments within the catchment of Lake Illawarra" in relation to "median wet weather conditions", including:

- total nitrogen 0.5 mg/L
- total phosphorous 0.05 mg/L
- filterable reactive phosphorous 0.02 mg/L
- total suspended solids 50 mg/L

Those water quality objectives have been addressed in the Water Cycle Management Plan.

In addition, the LISP identifies two desirable objectives with respect to water quantity discharges, being:

- "peak flows for all events up to and including the 100 year ARI event are not to exceed those from the existing land use conditions"; and

- "wherever possible, total runoff volumes will also not increase. This can be achieved via the application of such Water Sensitive Urban Design techniques as stormwater reuse and infiltration/extended storage techniques. It is realised that this objective may be difficult to achieve in many cases".

Both of those objectives have been taken into account in the design of the proposed development.

The overall aim in the LISP with respect to erosion and sedimentation is to "reduce the rate of sedimentation in the Lake to a pre-European level, restore areas of the Lake degraded by excessive sedimentation and minimise further erosion around the Lake".

The specific objectives identified in the LISP in this regard include inter alia:

- ES-1: "remediate areas within the Lake and its tributaries that are subject to foreshore and bank erosion and minimise susceptibility to future erosion"; and

- ES-2: "reduce sediment loads entering the Lake from both rural and urban catchments to pre-European levels".

The proposed development of the site will achieve both of these objectives by virtue of the impact amelioration and environmental management control measures which are incorporated into the construction phase of the development and the future operation of industrial sites within the development. In addition, the substantial enhancement of Frazer's Creek and its adjoining riparian lands will contribute to improvements in water quality conditions and flow regimes off the site.

Special attention has been paid to the potential for erosion of portions of Frazer's Creek, and the proposal will provide additional filtration to and protection of water quality within the Creek both during earthworks and construction activities and during subsequent use of the site.

The overall aim in LISP in relation to catchment management is to "seek to ensure that land usage decisions are made having regard to the quality and amenity of the Lake's environmental and recreational values".

Of the two specific objectives identified to achieve this aim, the proposed development of the subject site at Albion Park is relevant with respect to:

- CM-2: "prevent future development from increasing runoff volumes and pollutant loads".

These matters have been addressed above with respect to water quality and volumes, and the proposed development has incorporated measures which seek to minimise or avoid the discharge of contaminants, pollutants, sediment and excess water into the Lake Illawarra environment.

7.3.2 Impacts on Riparian Buffers

Riparian Buffers have been designated on the site both

along Frazer's Creek and around the wetlands on the site. The riparian buffer will have a variety of treatments at different locations, dependent on their structure and proposed functions. The different elements of the riparian buffers within the site include:

- a 25m wide riparian buffer on each side of Frazer's Creek upstream of the SEPP 14 wetland (in the southern part of the site). The majority of this portion of Frazer's Creek is currently characterised by pasture grasses with a very narrow band of native and introduced shrubs along parts of the Creek;

- a 25m wide riparian buffer around the ground-truthed SEPP 14 boundary. This riparian buffer has two different functions, with the riparian zone adjacent to the Business Park development consisting of a 10m band of natural ground adjacent to the wetland and 15m of buffer from the fill for the Business Park. Both of these areas are to be rehabilitated using native grasses, sedges and shrub species, but no tree planting will occur in this part of the riparian buffer. On the western side of the ground-truthed SEPP 14 wetland, the riparian buffer and additional lands to the western boundary of the subject site are to be rehabilitated using a variety of native vegetation types to provide a continual wildlife corridor or habitat corridor along the western side of the subject site;

- a minimum 40m wide riparian buffer along Frazer's Creek from the SEPP 14 wetland to the north eastern boundary of the site. In some places, particularly on the western edge of the northern parts of the Business Park development and on the western side of the site, the riparian buffer will be broader than 40m on the basis that no other use of those lands is practicable. The circumstances permit a broader riparian buffer at some locations although rehabilitation works on the subject site are limited to the property boundary, and the riparian buffer will therefore be less than 40m wide in some places because of the location of the property boundary and the Frazer's Creek channel. Most of the northern riparian buffer is to be planted with a variety of native vegetation types to provide a substantial habitat corridor through the subject site. This approach will substantially enhance the natural environment in this location.

There is to be a riparian buffer rehabilitation program conducted along the full extent of Frazer's Creek on the site, as well as around the retained wetlands on the site. South of the SEPP 14 wetland, the riparian buffer along Frazer's Creek is a nominal 25m wide, whilst north from the SEPP 14 wetland most of the riparian buffer is 40m wide.

It should be noted that these distances are nominal, and in several locations are greater than identified. Where there are residual pieces of land within the floodplain, these will also be rehabilitated for riparian and habitat corridor purposes.

The riparian buffer around the SEPP 14 wetland is a nominal 25m in width. Where the riparian buffer abuts the Business Park, the functions of that zone are primarily to buffer the wetland from potential impacts and to provide a protective band of native vegetation around the wetlands. In those areas, the 25m riparian zone will consist of:

- a 10m (approximately) band of vegetation which is to be rehabilitated from the current pasture grasses to native grasses and sedges; and

- the 15m batter slopes up to the Business Park which are to be vegetated using native grasses and sedges and small native shrubs. Stormwater discharges generally will be directed within each allotment away from the wetland buffer for treatment prior to discharge at identified points. In very substantial rainstorm events, however, there will be some overland flow from the development allotments into the vegetated buffer. These are only circumstances where there are very high levels of rainfall and stormwater discharge, and overland flows will be filtered through the 25m buffer strip around the wetlands.

On the western side of the SEPP 14 wetland, however, the riparian buffer has a different function. In this part of the site, the riparian buffer will extend to the western boundary and is intended to function both as in situ habitat for native biota and as part of a revegetated habitat corridor along Frazer's Creek. In addition, part of the riparian buffer at that location will be used to create additional stands of the paperbark swamp community, to replace that area which is removed in the south eastern corner of the subject site.

The VMP details the management regime to be undertaken both during the rehabilitation phase of the Frazer's Creek corridor and in the ongoing management program for the rehabilitated portion of the subject site.

Relevant elements of the VMP and the rehabilitation of the habitat corridor along Frazers Creek through the subject site include:

- the replacement of pasture with native grasses and sedges and at specific locations within the corridor with shrubland or open woodland of either casurinas or White Feather Honeymyrtle;
- planting of all batter slopes from the Business Park with native grasses, sedges and shrubs to provide both a means of protecting the batter slope soils and the adjoining rehabilitated riparian zones or wetlands; and
- the provision of a walking track through part of the riparian zone and a small recreation field near the end of the Albion Park airfield

7.4 Geotechnical

7.4.1 Background

Detailed studies have been carried out in relation to soils, contamination and acid sulphate soils on the site. The detailed reports are included in Appendix 8 and Appendix 9. The following is a brief summary of the major findings in these reports.

7.4.2 Soil Types

The soils on the site are Fairy Meadow soil landscape group with slopes usually less than 5%. It is not anticipated that any significant geotechnical constraints exist on the site that will influence development of the Business Park. However, there may be localised areas of unsuitable soils, particularly in the low lying areas. Bulk excavation and filling will be undertaken to alleviate flood concerns in the low lying areas. Any excavation of the soil across the site can be readily carried out using standard excavation equipment. Filling operations will generally be carried out under a Level 1 inspection and testing source as defined in AS 3798 – 1996 Guidelines for Earthworks for Commercial and Residential Developments. Soils imported onto the site will be subject to validation testing in accordance with the EPA (1995) Sampling Design Guidelines or appropriate documentation classifying the integrity of the imported material to confirm its suitability for the proposed land use.

Given the limitations relating to the Fairy Meadow soil landscape group on which the site is located, a geotechnical investigation will be carried out to confirm the ground conditions, determine suitable founding mediums and allow design of appropriate foundations for the proposed development.

7.4.3 Contamination

A Stage 1 Environmental Site Assessment has been prepared and the report is included in Appendix 9 .

The site assessment comprised a detailed site inspection and a review of historical and background information. Based on this information it was concluded that potentially contaminating activities associated with the use of the site as rural grazing land and a landscaping business include:

- Uncontrolled filling
- Maintenance of farm machinery
- Storage of chemicals, including petroleum hydrocarbons
- Pesticide and/or herbicide application
- Landscaping operations; and
- Asbestos containing materials and lead paint associated with structures

The following areas where past and present activities have had the potential
to cause contamination were as follows:

- Areas used for a landscaping business including: adjacent to the silo, stockpiled soil between the cottages and the south eastern portion of the site adjacent to the airport runway;
- A machinery maintenance shed and nearby vehicle carport;
- An above ground vehicle maintenance ramp and adjacent drainage channel;
- An area in the vicinity of three ASTs;
- An area surrounding an above ground waste oil storage tank;
- An area to the south of a dairy building where steel pipes may indicate the presence of underground fuel storage tanks;
- Land surrounding existing residential cottages and other buildings constructed with Asbestos Containing Materials (eg fibrous cement sheets) and which may have been painted in the past with lead-based paint;

- Potentially filled areas including land in the south west sector of Lot 6; farm tracks and an old well; and
- Former structures surrounding a silo.

It was concluded that further investigation is required in the identified areas of environment concern to determine the presence, nature and extent of potential contamination. However, it was concluded, pending the results of further investigations in these areas it is likely that the site can be used for the proposed commercial/industrial land use following any necessary remediation.

The following will be undertaken prior to the commencement of any development on the site:

- A Stage 2 Environmental Site Assessment, complying with EPA guidelines will be conducted to characterise the degree and extent of potential contamination at the site. The sampling program will target the areas identified as being of potential environmental concern (using a judgemental sampling pattern) and elsewhere, where contamination is unlikely, a grid (systematic) sampling will be undertaken. The laboratory results will be interpreted statistically and compared against guidelines appropriate to the proposed future use of the site;
- Based on the results of the Stage 2 investigation, and as required, remediation and validation of any contamination at the site be conducted to achieve the necessary clean up criteria.
- A hazardous materials audit of the buildings on the site will be carried out and hazardous materials identified as likely to be disturbed in any future demolition works. These works will be conducted in accordance with the relevant Australian Standards and Worksafe Codes of Practice;

7.4.4 Acid Sulphate Soils

There is a low to moderate PASS risk associated with some alluvial soils encountered across the site. In accordance with the Acid Sulphate Soils Management Advisory Committee guidelines a detailed management plan will be prepared and implemented prior to any excavation works for redevelopment or remediation of the site that will disturb the soil. Further assessment of acid sulphate soil risk will be undertaken during detailed assessment of the site and once the areas and volumes of excavated soil are known.

7.5 Noise

7.5.1 Impacts

An Acoustic Report has been prepared for the development proposal and a copy of this is included in Appendix 18. Potential noise impacts from the proposed development were assessed using the EPA New South Wales Industrial Noise Policy, the EPA Environmental Criteria for Road Noise and the existing background noise levels measured on site which is representative of the existing background noise levels at the nearest potentially affected residential receivers located to the west, south-west, south and southeast of the proposed development site.

Noise emissions from the proposed development were predicted to the nearest potentially affected residential receiver's sited to the west, south-west, south and south-east of the proposed development site. Noise emissions from truck movements associated with the proposed development site were corrected for distance attenuation, acoustic screening, façade attenuation and air absorption to determine the resultant noise level at the nearest potentially affected residential receivers. Calculations are based on 25 commercial vehicle movements per hour (entering and exiting the proposed site) in conjunction with 578 vehicle movements in the worst one hour. It is noted that the predicted noise emission levels are based on the worst one hour for the day and night time assessment periods. The worst one hour periods were determined on peak vehicle (including trucks) movements within the site. The predictions include the ancillary mechanical plant operating in all assessment periods. The report found that it would be necessary to implement measures to reduce the noise from truck traffic during the night hours if the site operated for 24 hours and the nature of the business.

Based on the traffic report (Appendix 17) the overall increase in noise level from road traffic will be well below the noise levels required to satisfy the EPA "Environmental Criteria for Road and Traffic Noise - 1999" guidelines. On this basis, noise generated by vehicles associated with the proposed development would not impact upon the nearest potentially affected residential areas.

7.5.2 Amelioration Measures

The Acoustic Report has recommended that should the development operated for 24 hours and that truck traffic would result as estimated then measures would need to be taken to reduce noise impacts. The report has suggested the construction of sound walls in two places on the site. This matter will be further investigated as the planning of the Business Park proceeds and will be determined depending on the operating hours of the site

and the nature of the businesses established there.

7.5.3 Airport Limits and Constraints

The noise limits in relation to the operation of the adjacent Illawarra Regional Airport have been examined as contained in the Noise Exposure Forecast Plan prepared by Shellharbour Council. According to this plan most of the site is within the ANEF 25 and ANEF 30 contours and as such is suitable for the proposed development providing all buildings comply with AS2021 regarding interior noise levels.

7.6 Built Form

7.6.1 Provisions to Complement Surrounding Existing Land Use

A detailed study has been carried out of the land use around the site and the visual significance of the site within this catchment. The immediate area around the site generally comprises open land at the airport and the rural land adjacent to the site. Urban development surrounds the area in the wider context. The site is visible from the roads immediately adjacent to it; Tongarra Road and the Illawarra Highway and from the airport and its environs. There are some industrial buildings on the airport and adjacent to it.

The uses in the surrounding areas are dominated by the development of new residential areas and the provision of land for employment uses has lagged behind the provision of housing. As a result there is a need for additional employment land in the region and this has been recognised in the Illawarra Regional Strategy. The provision of employment land on this site will be a complementary use to those already in existence in the surrounding area.

The development of this site as a Business Park will bring about a change in the visual environment and the character of this area. However, this is a change which is already underway as urban development takes place in the surrounding area. In order to ensure that the development of the Business Park is carefully controlled and that there will not be adverse visual impacts as a result of the development, detailed design guidelines and controls have been prepared to guide the future development of the site. A copy of these are included in Appendix 3.

The proposed guidelines aim to provide for the development of a Business Park of architectural quality urban context. The Guidelines introduce controls relating to building bulk and form and material and colours used on the site. A detailed landscaping plan has also been drawn up for the site which provides a planting regime to soften the impact of buildings on the streetscape and the

Figure 7.1 View from the Junction of the Illawarra Highway and the Princes Highway

7 ENVIRONMENTAL ASSESSMENT KEY ISSUES

Figure 7.2 View of the Development from Abercrombie Street

Figure 7.3 View of the Business Park from the Illawarra Highway with Wetland in Foreground

character of the adjoining area. It is also proposed that signage within the Business Park will be controlled.

The improvement of the wetland areas on the site and the surrounding open areas will provide a green context for the Business Park when viewed from the Illawarra High way and the conservation of the paper bark forest near the entrance will soften the impact of the development from this aspect.

It is considered that the provisions of the Guidelines will ensure that the ongoing development of the Business Park will be controlled to ensure that visual impacts and impacts on the surrounding uses will be complementary.

7.6.2 Views and Vistas

The visual analysis of the site and its context revealed that the greatest visual impacts of the development will be when it is viewed from the Illawarra Highway and Tongarra Road. Once one moves away from the site, the vegetation in the surrounding area obscures the views of the site from the middle distant residential areas and those higher up the escarpment. The only other views of the site are from the highest streets on the escarpment such as Abercrombie Street. The view from here though will be a very distant view seen in the context of the green areas between the site and the escarpment, the airport and the coastal area and water views.

There are no views of the site from the water.

As a result of the above the visual impacts of the development will be on the immediate environs of the site. In order to soften these visual impacts the proposed landscaping of the Business Park provides for planting around the edges of the site and along the roads within the site.

There are no vistas or views which will be blocked or obscured as a result of the development on the site.

7.6.3 Architectural Design

The Design Guidelines for the site have been developed by the architects who have extensive experience in industrial/commercial building design. The guidelines include controls on setbacks, site coverage, height and floor space ratio and examples of good design. All applications for the development of buildings on the site will need to comply with these guidelines and it will be suggested that architects be employed to prepare building plans for development applications for buildings on the site.

7.6.4 Public Domain

The main areas of public domain on the site are:

- The Environmental Management Zone
- The paper bark forest
- The area within the Infrastructure Zone
- The roads

The concept plan for the site includes detailed proposals for the improvement, revegetation and rehabilitation of the Environmental Management Zone. This area will be handed over to Shellharbour Council when the improvements have been completed and a management structure will be set up to ensure the funding for the ongoing maintenance of this area at no cost to the Council. The retained paper bark forest will be rehabilitated and will be maintained by the owners within the Business Park as an open forest area. No development will take place in this area.

The area within the Infrastructure Zone will be cleaned up and will be maintained by the owners in the Business Park until it is acquired by the Roads and Traffic Authority.

It is intended that the roads will be formed and landscaped as provided for in the Landscape Plan and these will then be handed over to Shellharbour Council as public roads.

7.6.5 Landscaping and Vegetation Management

Landscaping of the site is dealt with in two ways. A detailed Landscaping Management Plan has been included in the concept plan for the Business Park area, and a Vegetation Management Plan has been prepared for the Environmental Management Zone and for the paperbark forest area.

The landscaping plan provides for landscaping along the roads within the Business Park, and provides the guidelines for the on site landscaping of each lot when it is developed. The landscape plan is adopted as the Illawarra Regional Business Park Landscape Management Plan in for the site and all development applications are to comply with the provisions of this plan. Each major development application for a site is to provide a detailed landscape proposal and a landscape maintenance bond may be required.

The general objectives in relation to the landscaping of the site are to reflect the nature of the area and the context of the Business Park and to soften the impact of the built form. Site landscaping also has sustainability objectives of providing shade cover and where possible being drought

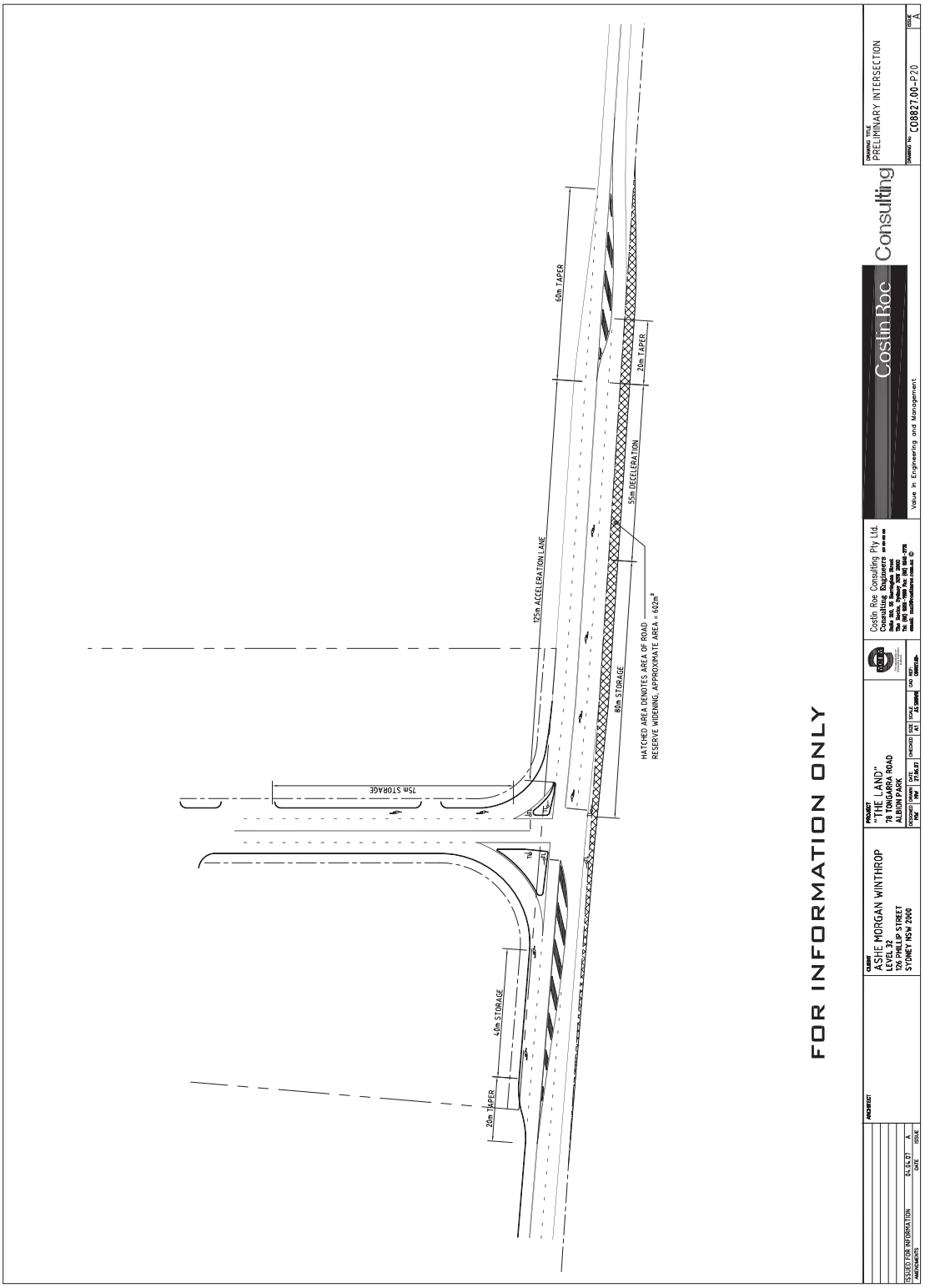

Figure 7.4 Intersection Design Plan

resistant and low maintenance.

There is also provision for landscaping along the edge of the Environmental Management Zone and around the heritage site adjacent to the Business Park.

The Vegetation Management Plan provides for the rehabilitation of the wetlands and other significant vegetated areas on the site and their ongoing maintenance and care. The implementation of this plan will be undertaken during the initial subdivision and site works and once this is completed and land handed over to Shellharbour Council, they will be responsible for the ongoing maintenance of the Environmental Management Zone. The maintenance of the other areas will be the responsibility of the owners of the Business Park.

7.6.6 Consistency with the Airport height Limitation and Noise Exposure Forecast Plan

The Shellharbour Rural Local Environmental Plan 2004 in clause 61 refers to a plan titled Airport Height Limitation and Noise Exposure Forecast Plan dated April 1998 and held at the office of Council and this is also referred to in the Director General's Requirements for the preparation of this EAR. Discussions with Council have indicated that a plan with this date does not appear to exist and a plan dated 2006 has been made available. This refers to a study carried out in May 1996 by GHD titled Illawarra Regional Airport Airport Noise Report. This plan also refers to the Illawarra Regional Airport Obstacle Limitation Surfaces Plan Drawing No. WO/002.

Height

The above plan has been interpreted by Costin Roe based on the Civil Aviation Safety Authority – Rules and Practices for Aerodromes Chapter 10 Obstacles in Airspace and the Airport Height Limitation Plan has been produced for the development of the Illawarra Regional Business Park. This plan places height restrictions on buildings around the airport runways and the planning controls for the site provide that any proposal for the site must be acceptable in relation to this. This is a similar clause to that in the Shellharbour Rural LEP however the plan has been reproduced on the above basis. Any development on the site will need to be consistent with this plan.

Noise

It would appear from the above documents that none of the land on the site falls within the A.N.E.F. 30 contour which is recommended in the s117 Direction relating to development near licensed aerodromes as appropriate for commercial or industrial purposes. All development will comply with AS 2021 regarding interior noise levels.

7.7 Transport and Access

7.7.1 Traffic Study

A detailed Traffic Study has been prepared for the proposed development of the site by Masson Wilson Twiney and this is included in Appendix 17. It concludes that the surrounding road network with the exception of the Princes Highway /Illawarra Highway intersection has adequate capacity to accommodate the proposed Business Park traffic.

7.7.2 Access Arrangements

Access arrangements for the site have been discussed with the RTA and because of environmental constraints, access is restricted to Tongarra Road. Discussions with the RTA and Council have indicated that any vehicle access on Tongarra Road should be located as far east as practical so as to provide the maximum possible separation between a potential future road interchange/ intersection between an Illawarra Highway upgrade road within the RTA road reserve.

As a result the proposed access to the site has been located as far east as practical along Tongarra Road in accordance with the RTA's request. The new site access will be a signalised intersection with left turn and right turn bays along Tongarra Road approaches and pedestrian crossing facilities on all approaches.

The design of the site access at Tongarra Road has been based on the final development of the Business Park with 1650 employees.

The intersection was analysed and this indicated that the design will provide satisfactory vehicular access to and from the proposed development for future long term operating conditions along Tongarra Road.

7.7.3 Access to the New Freeway

The road reserve runs through the sensitive environmental areas of the site and as a result these are likely to prohibit any direct vehicle access between the site and a potential future freeway road along the RTA road reserve adjacent to the Illawarra Highway.

Access to and from a future freeway road would be via an interchange at Tongarra Road, or other appropriate location. To assist with any future design of a freeway / Tongarra Road interchange, the site access to the proposed Business Park at Tongarra Road has been set as far east as possible as requested by the RTA. This

maximises the separation between the site access and any future potential interchange.

No detailed designs have been prepared for the upgrade of the Illawarra Highway nor have funding or timing been allocated to the project. It is not included in the Illawarra Regional Strategy 2006 – 2031 as a future road project.

7.7.4 Intersection Modelling

The Traffic Study has modelled the key intersections in the vicinity of the site and has found that all will operate at a satisfactory level of service once the development is completed apart from the intersection of the Illawarra Highway/Princes Highway intersection. This intersection currently experiences poor operation in the am peak period and the proposed development will not have a significant impact on this existing operation. The RTA is currently investigating this situation and the proponent will continue to liaise with the RTA in relation to this matter.

7.7.5 Pedestrian Access

Pedestrian access to the site will be provided from the main entrance. There will also be pedestrian access into the Environmental Management Area from the site.

7.7.6 Cycle Access

There is currently a Council bicycle route along Tongarra Road and access will be provided from the Business park to this route.

7.7.7 Connection to Public Transport

The site is extremely well connected to public transport. There are a number of existing bus routes along Tongarra Road between Albion Park and the rail stations at Albion Park and Oak Flats and Shellharbour. There is also a route to Wollongong which passes the site. There are frequent train services during the am and pm peaks from the stations and the bus operators have indicated interest in running bus services particularly in peak periods into the business park. The proposed internal road system provides a loop road system suitable to accommodate a loop bus service within the site. Existing bus operators consider that the development will improve the viability of the existing bus services in the area.

7.8 Subdivision

The subdivision plan has been drawn up for the development and it results in the production of 63 lots one of which is the Environmental Management Zone. Access to the lots is via a central ring road system with a private road accessing the lots to the north of the airport runway. This road system will provide an efficient access route through the development and the Traffic Report has concluded that the site access arrangement provided in the subdivision plan are satisfactory.

To achieve the design levels for the subdivision cut to fill earthworks will be required on both the northern and southern portions of the site. All development within the Business Park will have a minimum finished floor level of AHD 7.1. The batter of the fill will run along the boundary of the Business Park and this will be planted as part of the landscaping of the site. An Erosion and Sediment Control Management Plan has been prepared to ensure that these works proceed without polluting surrounding waters.

The size of the sites in the subdivision has been determined on the basis of ensuring that there is a range of sites to meet demand in the area. The Illawarra Regional Strategy has identified that there is a need for larger industrial sites in the area and as a result 10 of the sites are over 10000m2 and 24 are between 5000m2 and 10000m2.

It is intended that each developable allotment will be burdened for the maintenance and upkeep of the Riparian Buffer to Frazers Creek, the adjoining wetland area and the woodland area. Each allotment burdened by the Riparian Buffer of 25m will also maintain the buffer area and its use will be restricted to environmental management only. The allotments which have been wholly or partly filled will be burdened by a restriction on the use of the land.

7.9 Utilities Infrastructure

A Utilities Report has been prepared for the provision of utilities infrastructure to the site and this is included in Appendix 16. It concludes that, with appropriate augmentation as part of the development proposal, there will be sufficient capacity in the systems to service the development of the site.

7.10 Stormwater Management

7.10.1 Drainage and Stormwater Management Measures

In the context of rainfall and water use management, the proposed development is to include an innovative, low cost, water quality management strategy that is based on ecologically sustainable development (ESD) and Water Saving Urban Design (WSUD) principles. The key principles of the system are to:

1. Protect and maintain natural systems
2. Protect water quality by improving the quality of

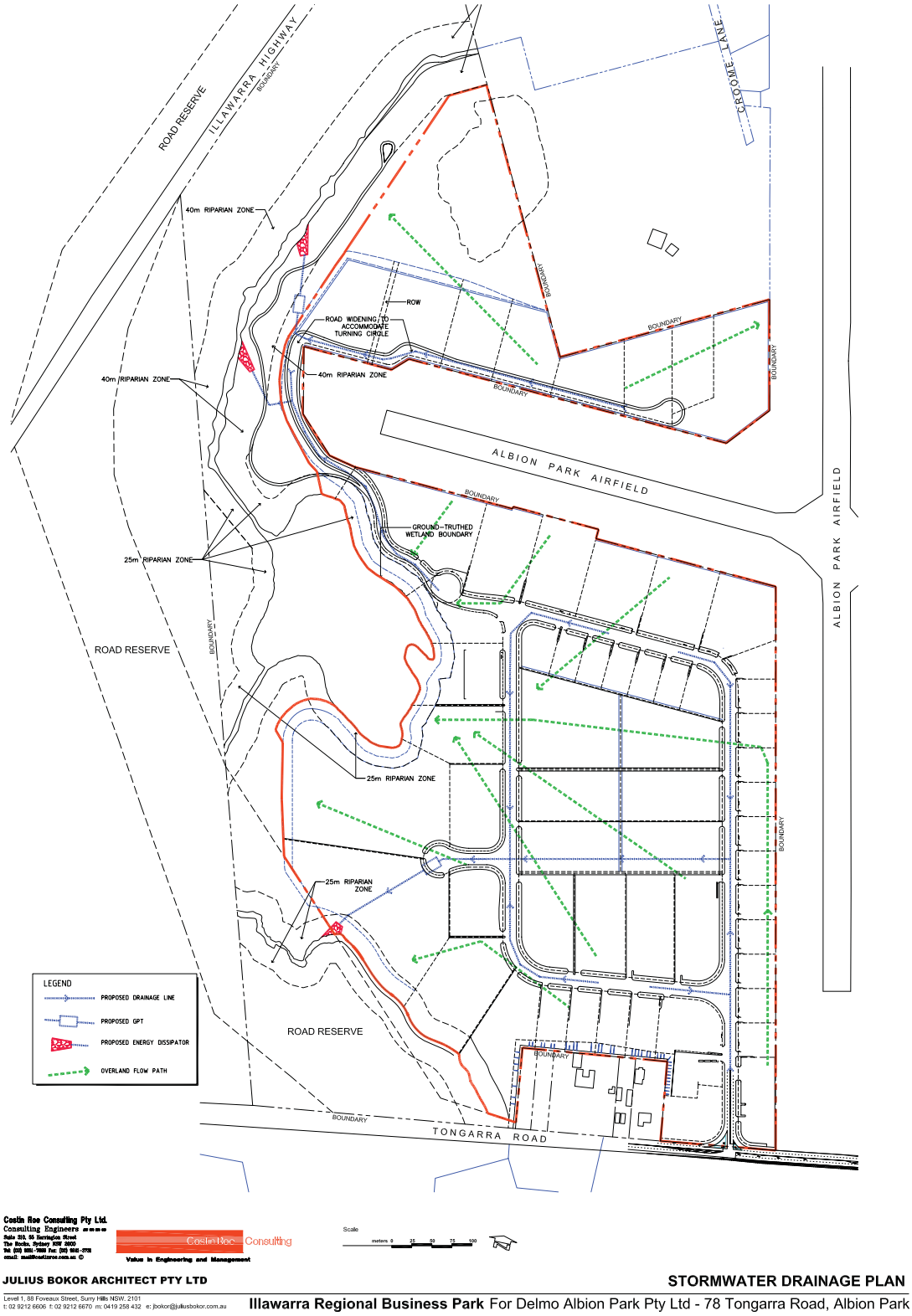

Figure 7.5 Stormwater Drainage Plan

stormwater runoff draining from urban developments.
3. Integrate stormwater treatment into the environment by using stormwater treatment systems within the landscape that incorporate multiple uses providing a variety of benefits such as water quality treatment, wildlife habitat, public open space, recreational and visual amenity for the community.
4. Reduce runoff peak flows from developments by on-site temporary storage measures (with potential for reuse) and minimise impervious areas.
5. Add long-term value while minimising development costs. This includes ecological and economical impacts.
6. Reduce potable water demand by using stormwater as a resource through capture and reuse for non-potable purposes.

As defined by the National Strategy for Ecologically Sustainable Development (1992), ecologically sustainable development is "Development that uses, conserves and enhances the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life now and in the future can be increased." It is proposed that the Illawarra Regional Business Park will incorporate methods to achieve a balanced approach towards these key principles. These can be simply achieved at this stage of a new development. It can be expected that this development can set new standards to WSUD for the Illawarra Region.

The proposed development provides an important opportunity to the improvement of water quality in Frazer Creek and the associated wetlands. Results from the National Land and Water Resources Audit show that rural runoff has detrimental impacts on water quality and maintenance of wetlands. Typically high nutrient loads from rural runoff lead to degradation of water quality due to higher than normal oxygen uptake and increased algae growth. The removal of high nutrient loads combined with an improvement in the management of the creek and wetland will improve the overall quality of waterways in the vicinity of the development.

The environmental and water management constraints to this development include Frazer's Creek, the SEPP No.14 wetland, the location of the development in a flood affected zone and the flat terrain of the site. Frazer's Creek and the SEPP No.14 wetland lead to a requirement for a management and treatment system to ensure that the impacts to these existing water bodies is mitigated. The flat terrain of the site presents challenges to providing an effective drainage system. The low grades of roads, swales and piped drainages increases the required infrastructure size and potentially restricts water flow. Moreover, careful consideration of rainwater runoff management during peak rainfall events is important to reduce flooding risk and to maintain good access to the site and buildings at all times.

The objective of the treatment and management strategy for this site is to shift the responsibility for water quality and use to lot owners. This will be shared with the community by having Shellharbour Council responsible for the management of road runoff only. The final outcome of the strategy is to provide a highly effective water and re-use management practice that builds on the opportunity to improve the water quality in the existing degraded water ways. These measures have been described in the Water Cycle Management Plan contained in Appendix 4. This plan will be adopted as part of this Concept Plan and all subsequent applications for development on the site will need to demonstrate compliance with the requirements of the plan as part of their application. Generally the plan requires each lot to implement their own on site detention and on site retention. Discharge from each lot will be limited to that which existed prior to the development or a lesser amount. Stormwater will be treated on the individual lots before it is discharged.

7.10.2 Stormwater Detention

Stormwater treatment is to be based using a holistic approach. To determine the best methods of treatment then for the site, the design will be based on using case studies and knowledge of existing successful uses of treatment methods to justify the designs efficiency in meeting these requirements. The system will be modelled using an estate trunk drainage line that is to service the roads and individual lots. The system will convey water from the road and lot areas to four outlet points located along the banks of Frazer's Creek.

A combined OSD and OSR tank will be located on each site. The tank will be buried with the OSD component limiting the discharge from site to those of predeveloped flows and the OSR component providing a source of non-potable water. The method involves determining the mean annual and monthly rainfalls for the development area, the expected water demand and the approximate catchment or roof area of the development, to determine the required tank size. This method is typically used for residential purposes and has been modified for the intended commercial zoning of the subdivision. These modifications include a smaller water demand per person and a lower percent of security as mains water will be available for topping up purposes. Information for the mean annual and monthly rainfall for the region has been obtained from the Bureau of Meteorology. The expected

water demand has been based on an expected average daily use of 100 litres per person. Due to the differing lot sizes a catchment area range was used, this is between 800m^2 and 3000m^2. The tank volume allows for a maximum period of 10 days of dry weather before it will require topping up from the mains water supply. A table will be given to be used by the lot developer to determine the minimum size of rainwater tank that is to be used on the site. The OSD volume is to be calculated so that the post development stormwater discharge flow is equal to or less than the pre developed stormwater discharge.

7.10.3 Water Sensitive Urban Design Measures

Water Sensitive Urban Design Measures have been adopted for the development. This involves each lot providing a source of water for non potable use. This is accomplished through the use of on site stormwater collection and retention. Roof stormwater run off is to be collected and stored in a rainwater tank where it can then be reused for such purposes as toilet flushing, laundry facilities and irrigation for the landscaped areas. Each proposal for the development of a lot will need to produce details of this system as part of the application for development consent.

7.11 Staging of Development

The proposed development will be carried out in five stages to ensure that the development is orderly and that the land will be released to the market as required. The initial stages relate to subdivision, the site preparation works and the commencement of the rehabilitation of the wetland area and the Environmental Management Zone. Work will be completed on most of this area by Stage 3. The northern section of the site will not be developed until Stage 5 and as demand requires.

7.12 Consultation

A report on the consultation which has been carried out on the project and which is proposed to be carried out in the future is included in Appendix 20. The program was divided into two stages. Stage 1 covered the period from November 2006 to April 2007 and Stage 2 will cover the period following the submission of the Concept Plan to the Department of Planning.

During Stage 1, the aim was to identify and contact those people and organizations who could most immediately be impacted on by the proposed development or would have a direct interest in the site. These groups comprised residents and businesses whose properties bordered the site and the local aboriginal groups. A series of meetings were held and follow up phone calls carried out. Issues raised were as follows:

Issue:
Concerns regarding any development along the western boundary of Ravensthorpe Guest House due to the use of this area as a backdrop for photos for wedding parties at the Guest House

Response:
An undertaking was given to the proprietors of Ravensthorpe that there would be no development along the Western boundary of Ravensthorpe in order to preserve this view corridor

Issue:
Concerns regarding the visual impact of development to the north of Ravensthorpe, particularly from the guest house's pool area

Response:
An undertaking was given to the proprietors of Ravensthorpe that a vegetation buffer zone would be created along the fence line between the two sites (northern boundary of Ravensthorpe) to provide a screen of trees. The site will also be lowered along this boundary which will reduce the possibility of buildings being viewed from the Ravensthorpe pool/garden area

Issue:
Concerns were raised regarding potential noise impact from the site during evening hours if uses included live entertainment

Response:
Intended zoning for the site is light industrial and it is not expected that this would include live entertainment venues

Liaison with local Aboriginal groups commenced in March 2007. Contact was made with key representative groups including:

- Northern Illawarra Aboriginal Collective
- Illawarra Local Aboriginal Land Council and
- Wodi Wodi Elders Corporation.

Formal notification was also issued to the Korewal Elouera Jerrungarugh Tribal Elders and the Wadi Wadi Coomaditchie United Aboriginal Corporation.

The aim of the Stage 2 consultation program will be to

present the concept plan to residents and organizations contacted during Stage 1 as well as the broarder community.

During Stage 1 a detailed focus meeting was held with the responsible Government Departments and Authorities in relation to the major issues for the development. The minutes of this meeting are included in Appendix 20.