

# **Industrial Subdivision – Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake**

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**Western Australian Land Authority trading as LandCorp**

**Report and recommendations  
of the Environmental Protection Authority**

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## Summary and recommendations

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal to subdivide approximately 89 hectares of land being Lot 502 bounded by North Lake, Phoenix and Sudlow Roads and a rail reserve, for industrial and mixed business purposes. The proponent for the proposal is the Western Australian Land Authority trading as LandCorp (LandCorp).

The EPA is reporting on a reassessment of the proposal originally submitted to the Department of Environmental Protection (DEP) as a subdivision application by the Western Australian Planning Commission in May 2000. It was subsequently referred by the DEP to the EPA for consideration under Part IV of the *Environmental Protection Act 1986* and reviewed at an Environmental Protection Statement (EPS) level of assessment. This reassessment is as a result of the Minister for the Environment and Heritage having referred the proposal back to the EPA, following the determination of appeals in August 2001. The appeals were against both the level of assessment set by the EPA at EPS and the EPA's report and recommendations in Bulletin 999 (EPA 2000). In the appeal decisions, the Minister noted that although the EPA had taken into account that the site was not required for Bushplan purposes, examination of the values of the bushland was warranted given the large area of bushland on the site.

The Minister required that the proposal be reassessed more fully and more publicly. The proposal was subsequently reviewed at a Public Environmental Review (PER) level of assessment. LandCorp's PER document (Welker 2002), and the proponent's response to submissions (LandCorp 2003) describe the proposal.

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

### **Relevant environmental factors**

It is the EPA's opinion that the following are the environmental factors relevant to the proposal:

- (a) bushland values;
- (b) fauna;
- (c) protection of South Lake and wetland buffer;
- (d) protection of landscape values;
- (e) site contamination; and
- (f) drainage management.

There were a number of other factors which were very relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

## **Conclusion**

The EPA has considered the proposal by LandCorp to subdivide Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake.

### ***Bushland, fauna, wetland buffer and landscape protection***

The EPA notes that the bushland on the site is not required for the purposes of Bush Forever. The EPA has accepted that Bush Forever is a way forward for the Government to preserve regionally significant vegetation within the Swan Coastal Plain portion of the Perth Metropolitan Region.

The EPA notes that the vegetation on the site is of the Karrakatta Central and South complex, that Bush Forever proposes to protect less than the target level of 10 % of that complex in the Bush Forever study area, and that Bush Forever considers that there are better opportunities for conservation of that complex to the north of the metropolitan area. The EPA notes that the floristic communities on the site are not restricted to the Karrakatta Central and South complex, and are considered to be well reserved.

The focus of the EPA is on the protection of regionally significant natural areas. In the absence of the site being required for Bush Forever, the EPA considers that the main values of the bushland on the site relate to its proximity to the Beeliar Regional Park and South Lake, and are as follows:

- The presence of upland habitat likely to be used by fauna associated with South Lake and the adjoining Beeliar Regional Park;
- The presence of habitat on Lot 502 that some species of National and Regional Conservation Significance may utilise, though no species is likely to be dependent on Lot 502 for its persistence in the region;
- The presence of habitat that is utilised by some species of special interest;
- The provision of a buffer to protect the values of South Lake; and
- The landscape value of part of the site as a backdrop to Beeliar Regional Park.

The EPA also notes that the removal of bushland from the site is of high concern to the community. Whilst the focus of the EPA is on the protection of environmental values at the regional level, the EPA encourages the protection of local values.

Following the public review period and in consultation with the EPA, the proponent has modified its proposal and commitments to improve environmental outcomes. Taking into account the increase in the area of mature upland vegetation to be included in the buffer to South Lake, and the proponent's commitments to the rehabilitation of degraded land in the buffer to meet performance criteria, the staging of subdivision, and landscaping of the estate, the EPA has concluded that its

objectives for bushland, fauna, wetland protection and landscape protection, can be met.

### ***Site contamination***

The EPA has concluded that contamination of portions of the site as a result of paper manufacturing operations is manageable and notes that the proponent has committed to the preparation and implementation of a Soil and Groundwater Contamination Management Plan.

### ***Drainage management***

The EPA has concluded that stormwater drainage from the industrial subdivision can be managed to prevent adverse impacts on the water quality of South Lake and the Beeliar Regional Park. The EPA notes that the groundwater flow is in a westerly direction away from South Lake and that the proponent has committed to prepare and implement a Drainage Management Plan.

It is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for these factors subject to the ceding of a buffer around South Lake for Regional Park purposes as shown on Figures 2 and 3; rehabilitation of 15 ha of degraded land in the buffer immediately to the south and west of South Lake; the preparation and implementation of a Rehabilitation and Bush Restoration Plan and a Landscape Protection and Management Plan; the staging of the subdivision so that the rehabilitation in the buffer is of sufficient maturity prior to commencement of clearing of the final two stages (Stages 7 and 8 as shown in Figure 2); and the preparation and implementation of environmental management plans addressing construction, soil and groundwater contamination, and drainage.

The EPA has therefore concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the proponent's commitments and the recommended conditions set out in Appendix 4.

### **Recommendations**

The EPA submits the following recommendations to the Minister for the Environment and Heritage:

1. That the Minister notes that the proposal being assessed is for the subdivision, in a staged manner, of Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

## **Conditions**

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Western Australian Land Authority trading as LandCorp to subdivide Lot 502 North Lake, Sudlow and Phoenix Roads, for industrial and mixed business purposes is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) That the proponent be required to fulfill the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 4;
- (b) That, prior to implementation of the proposal, the proponent shall develop a Rehabilitation and Bush Restoration Plan, as specified in Condition 6-1;
- (c) That, prior to implementation of the proposal, the proponent shall develop a Landscape Protection and Management Plan, as specified in Condition 7-1;
- (d) That the proponent shall implement the Rehabilitation and Bush Restoration Plan and the Landscape Protection and Management to the requirements of the Minister for the Environment and Heritage on advice of the EPA;
- (e) That the proponent shall submit a performance review report to the EPA, prior to the commencement of each of Stages 2 to 8 of the development (as shown in Figure 1 Schedule 2 in Appendix 4);
- (f) That the proponent shall submit a detailed performance review report at the finalisation of Stage 6 (as shown in Figure 1 Schedule 2 in Appendix 4) that demonstrates the achievement of the criteria specified in the Rehabilitation and Bush Restoration Plan to the requirements of the Minister for the Environment and Heritage on advice of the EPA; and
- (g) The proponent shall demonstrate that the performance criteria detailed in the Rehabilitation and Bush Restoration Plan have been achieved prior to commencing any clearing or ground breaking activities associated with the development of Stages 7 and 8 (as shown in Figure 1 Schedule 2 in Appendix 4).

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# 1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal to subdivide approximately 89 hectares of land being Lot 502 bounded by North Lake, Phoenix and Sudlow Roads and a rail reserve, for industrial and mixed business purposes. The proponent for the proposal is the Western Australian Land Authority trading as LandCorp (LandCorp).

The site is immediately to the west of South Lake, approximately 17 km south of the Perth CBD as shown in Figure 1. South Lake is part of Beeliar Regional Park and Bush Forever Site No. 254, and is subject to the provisions of the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*.

The subdivision proposes approximately 170 lots for general industrial and mixed business use, and sets aside land for open space and road purposes. The subdivision layout is shown at Figure 2.

The site contains extensive areas of remnant vegetation and is partly affected by waste products of the Amcor paper mill. Lot 502 is zoned Industrial under the Metropolitan Region Scheme and Industry under the City of Cockburn Town Planning Scheme No. 3.

This report is a reassessment of the proposal originally submitted to the Department of Environmental Protection (DEP) as a subdivision application by the Western Australian Planning Commission in May 2000. It was subsequently referred by the DEP to the EPA for consideration under Part IV of the *Environmental Protection Act 1986* and reviewed at an Environmental Protection Statement (EPS) level of assessment.

The EPA concluded from the EPS assessment that the industrial subdivision proposal was capable of being implemented in an environmentally acceptable manner such that it was most unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of its commitments.

Appeals were lodged against the EPS level of assessment and the EPA's report and recommendations in Bulletin 999 (EPA 2000). These appeals were determined by the Minister for the Environment and Heritage in August 2001. The Minister determined that the EPA should formally assess this proposal more fully and more publicly. The proposal was subsequently reviewed at the Public Environmental Review (PER) level of assessment. The Minister noted that although the EPA had taken into account that the site was not required for Bushplan purposes, examination of the values of the bushland was warranted given the large area of bushland on the site.

LandCorp's PER document (Welker 2002), and the proponent's response to submissions (LandCorp 2003) describe the proposal.



Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the environmental factors relevant to the proposal. The Conditions and Commitments to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides Other Advice by the EPA, Section 6 presents the EPA's Conclusions and Section 7, the EPA's Recommendations.

Appendix 5 outlines the matters raised in submissions. The summary of submissions and the proponent's response to submissions is included in the attached CD as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process and which have been taken into account by the EPA appear in the report itself.

## 2. The proposal

The proposal is to subdivide approximately 89 hectares of land being Lot 502 bounded by North Lake, Phoenix and Sudlow Roads and a rail reserve, for industrial and mixed business purposes. The proponent for the proposal is the Western Australian Land Authority trading as LandCorp (LandCorp).

The site is immediately to the west of South Lake, approximately 17 km south of the Perth CBD as shown in Figure 1. The subdivision proposes approximately 170 lots for general industrial and mixed business use, and sets aside land for open space and road purposes. The subdivision layout is shown at Figure 2.

The site is zoned Industrial under the Metropolitan Region Scheme and Industry under the City of Cockburn Town Planning Scheme No. 3.

The proposal (as presented in the PER) originally consisted of 180 industrial lots, associated roads and other infrastructure, drainage areas, and local and regional public open space, and the removal of approximately 1.6 million cubic metres of earth. A buffer 150 metres from the high water mark of South Lake was originally proposed, comprising an area of 6.24 ha to be protected from development. In the south west corner of Lot 502, tuarts and four scarred trees of Aboriginal significance are shown for retention on 1 ha of public open space.

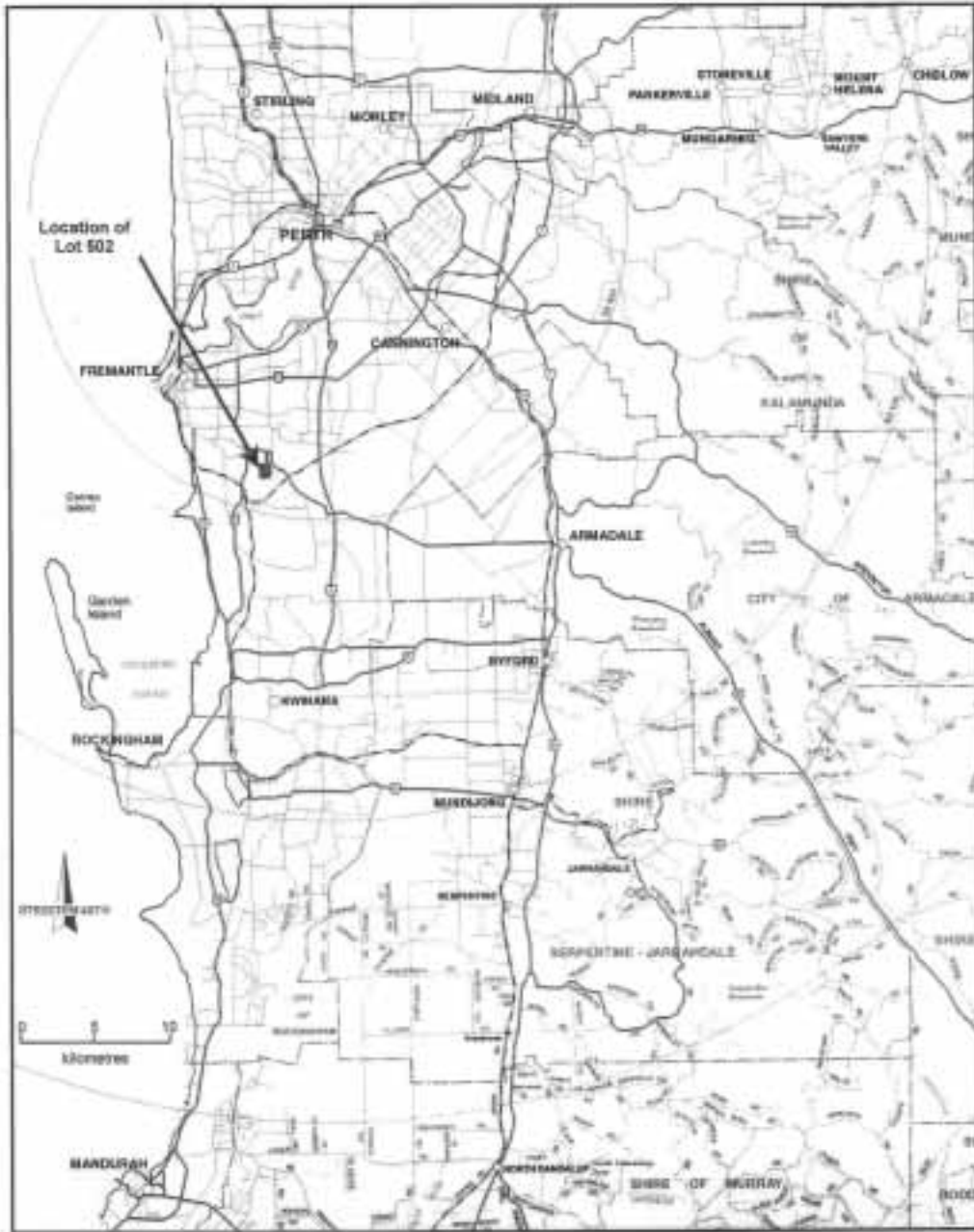
Since preparing the PER document and after consultation with the EPA and in response to public concern over the size of the development, LandCorp has made the following changes to their proposal:

- Increased the area to be given over to the Beeliar Regional Park from 6.2 ha to 11.2 ha, which now represents 12.6% of the site;
- Increased the size of the buffer to South Lake such that it is up to 214m from the boundary of Lot 502, to include some areas of upland remnant bushland;
- Reduced the number of lots to be created from 180 to approximately 170;
- Undertaken to rehabilitate 10 ha of degraded areas of Beeliar Regional Park to the south and 5 ha in the increased buffer area to the west of South Lake as shown on Figure 3. The rehabilitation work is to be carried out under the management of the Department of Conservation and Land Management (CALM); and
- Altered the order of development of stages of the subdivision after consideration of the need to allow fauna opportunity to move from areas being disturbed into areas that have been rehabilitated or into areas of remnant vegetation. The proposed staging of the development is shown in Figure 2. LandCorp's original staging order was based on marketing potential and engineering factors, while the new staging order is based on mainly environmental needs and engineering factors.

The key characteristics of the proposal are described in Table 1. The proponent provides a list of key stakeholders consulted and environmental studies undertaken, in the PER (Welker 2002) and in their response to submissions (LandCorp 2003).

**Table 1 Key characteristics of proposal**

Characteristic	Description
<b>Location</b>	Lot 502 North Lake Road, Phoenix Road, and Sudlow Road, Bibra Lake, City of Cockburn
<b>Industrial subdivision</b>	
Total Area of Lot 502	Approximately 89 ha
Number of lots	Approximately 170
Public open space (additional to South Lake buffer)	Approximately 4.5 ha
Associated infrastructure	Roads as shown indicatively on Figure 2
	Native vegetation gardens at North Lake Road entrance and along road verges and median strips where practicable
	Power
	Water
	Gas
	Communications
	Drainage
Vegetation disturbance	Approximately 60 ha of mostly Jarrah Banksia woodland in degraded to very good condition
<b>South Lake buffer strip</b>	
Regional Open Space	As shown indicatively on Figure 2 and at least 11.2 ha in area
<b>Rehabilitation programs</b>	
Rehabilitation of buffer on Lot 502	5 ha on Lot 502 to be rehabilitated within South Lake buffer strip as shown indicatively on Figure 3
Rehabilitation program around South Lake	Area of approximately 10 ha to be rehabilitated within Beeliar Regional Park adjacent to the southern edge of South Lake as shown on Figure 3
<b>South west corner of Lot 502</b>	
Public Open Space	As shown indicatively on Figure 2 and at least 1 ha in area to retain tuarts and four Aboriginal scar trees



**Figure 1: Site Location**

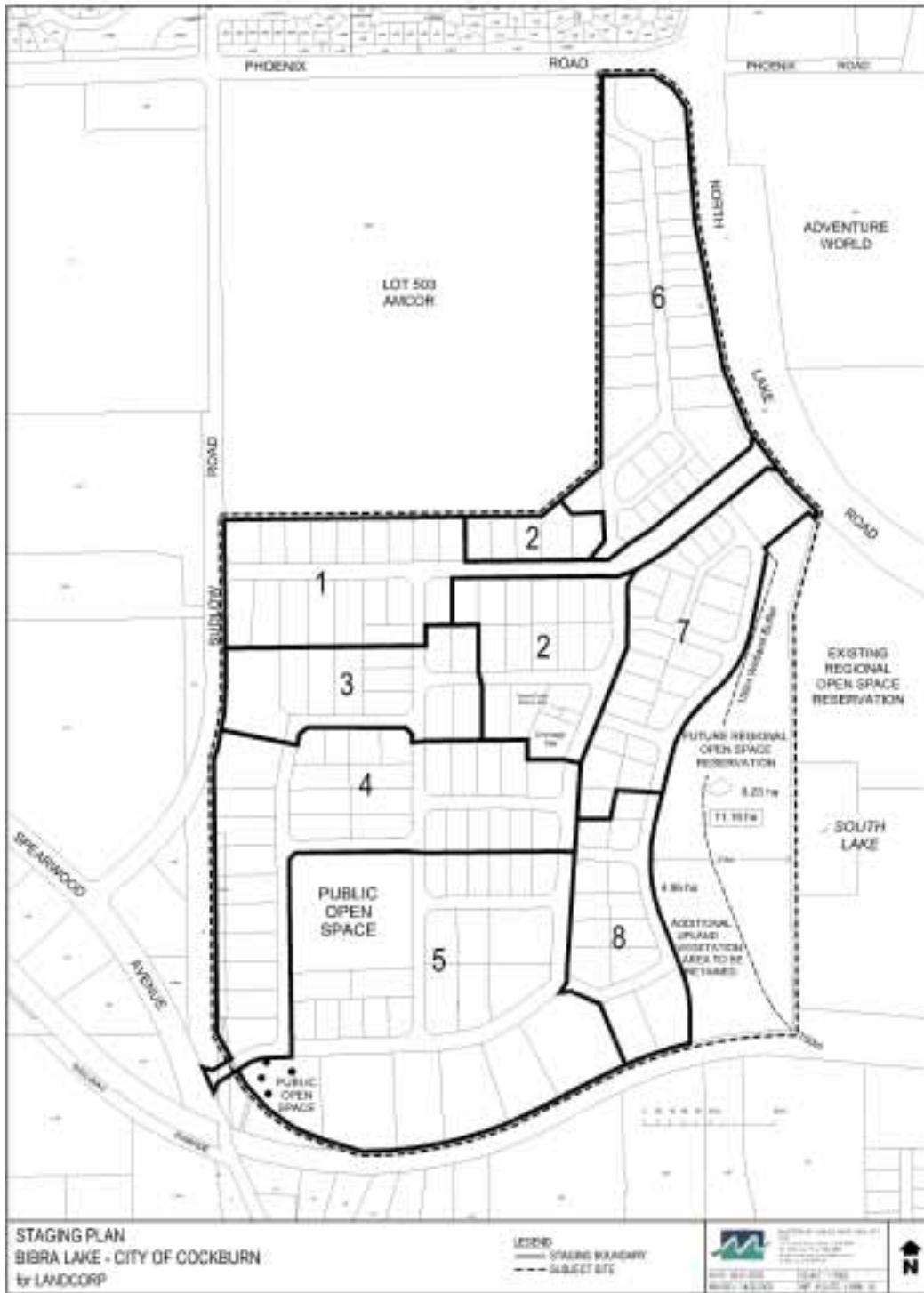


Figure 2: Lot 502 Staged subdivision plan and buffer



**Figure 3: Proposed rehabilitation**

### 3. Relevant environmental factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

The identification process for the relevant factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors are relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

The relevant factors considered previously in the EPS (EPA 2000) were:

- (a) protection of South Lake and wetland buffer;
- (b) fauna;
- (c) protection of landscape values;
- (d) site contamination; and
- (e) drainage management.

In the appeal decisions on the EPS, the Minister noted that although the EPA had taken into account that the site was not required for Bushplan purposes, examination of the values of the bushland was warranted given the large area of bushland on the site. The Minister required that the proposal be reassessed more fully and more publicly.

It is the EPA's opinion that the environmental factors previously considered remain relevant to this assessment with the addition of the factor of bushland values. Consequently the relevant factors considered for this report are:

- (a) bushland values;
- (b) fauna;
- (c) protection of South Lake and wetland buffer;
- (d) protection of landscape values;
- (e) site contamination; and
- (f) drainage management.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors generated from the earlier EPS, the appeal decisions, the PER document and the submissions received, in conjunction with the proposal characteristics.

Details on the relevant environmental factors and their assessment are contained in Sections 3.1 - 3.6. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor is

where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

### **3.1 Bushland values**

#### **Description**

The proposed subdivision of Lot 502 involves the gradual removal of approximately 59 ha of *Eucalyptus marginata/Banksia attenuata* Closed Forest and Woodland and 0.9 ha of Tall Open Scrub to Tall Shrubland of *Hakea prostrata*, *Jacksonia furcellata* and *Kunzea glabrescens*. Lot 502 adjoins the Beeliar Regional Park and South Lake. These form part of Bush Forever, the Government's strategic plan for the conservation of bushland on the Swan Coastal Plain portion of the Perth Metropolitan Region.

The following biological reports on the site have been prepared:

- Vegetation and flora - Bennett (2001);
- Declared rare and priority flora – Weston (1999) and Weston (2000); and
- Fauna – Bamford (2000), Bamford (2001), Bamford (2002), Bamford (2003).

Some key characteristics of the bushland are described below. A more detailed description of the fauna, the values of the land near South Lake, and landscape values are provided in sections 3.2 to 3.4.

#### ***Vegetation complexes***

The vegetation of Lot 502 is in the Karrakatta Central and South complex as mapped by Heddle *et al.* (1980). At a regional level, the Swan Coastal Plain Bioregion within the System 6/System 1 area contains 14,729 ha remnant vegetation of the Karrakatta Central and South complex (EPA 2003). This represents 29.5% of the original extent of this complex. Within the Bush Forever portion of the Swan Coastal Plain currently 18% of Karrakatta Central and South complex remains. Bush Forever identifies a reservation target of 8% (2,590 ha) of the original extent of the complex in the Bush Forever portion of the Swan Coastal Plain.

Therefore, at a regional level (Swan Coastal Plain Bioregion), the proposal represents a reduction of approximately 0.4% of the Karrakatta Central and South complex. The clearing represents a decrease of approximately 1.0% of the current extent of the Karrakatta Central and South complex in the Perth Metropolitan Region.

Although Lot 502 was considered twice for inclusion in Bush Forever it was not included. The advice of the Department for Planning and Infrastructure on the Bush Forever process is provided below under the heading "Assessment".

#### ***Vegetation communities***

Two Floristic Community Types, 11 and 28, were identified on the site (Bennett 2001). Floristic Community Type 28 is the dominant floristic community type. Both are well reserved and considered of low risk conservation status (Gibson *et al* 1994).



Bennett (2001) found three vegetation types on the site. Floristic Community Type 28 included two vegetation units:

- Closed Forest to Woodland of *Eucalyptus marginata* subsp. *marginata* and *Banksia attenuata* with occasional to dense *Corymbia calophylla*; and
- Tall Open Scrub to Tall Shrubland of *Hakea prostrata*, *Jacksonia furcellata* and *Kunzea glabrescens*.

Floristic Community Type 11 was represented by one vegetation unit:

- Open Woodland of *Eucalyptus rudis* and *Banksia grandis*.

In comparison, Bennett noted that the nearby Bush Forever sites, 234, 256, 391 and 244 recorded 6, 9, 7 and 5 vegetation units. These sites also included vegetation associated with a lake.

The communities on Lot 502 are not restricted to Karrakatta Complex Central and South.

### **Flora**

Approximately 172 vascular plant taxa were recorded at Lot 502, 67 of which were weed species (Bennett 2001). Two of the flora surveys were conducted during spring periods that should maximise the number of species observed including the presence of annuals (Weston 1999, Weston 2000 and Bennett 2000). Two surveys specifically for rare and priority flora were carried out (Weston 2000, Weston 2001). Weston and Bennett did not find any rare or priority flora present within the bushland on the site.

### **Fauna**

Fauna is discussed in this section for context, and in more detail in Section 3.2.

There are possibly up to 147 vertebrate species, eleven of which are introduced species, utilising Lot 502. These possibly consist of eight species of frogs, 38 species of reptiles, 80 species of birds, and 16 species of mammals (11 native and five introduced) (Welker 2002).

Bamford (2000) found that the project area may be utilised by 8 species of threatened vertebrate fauna that are of National Conservation Significance, and that of these species only the Short-billed Black-Cockatoo (*Calyptorhynchus latirostris*) rates a high level of significance. It may rely on the woodland for foraging. In addition 10 threatened invertebrate species are in the Perth region but it is difficult to predict their presence or abundance in the proposed development area. The Bamford reports identify 26 bird species that are listed as significant birds in Table 15 of Bush Forever (Government of Western Australia 2000).

No species are expected to be reliant on Lot 502 for their persistence in the region.

Bamford (2002) reported that observations on birds and mammals in particular suggest that “the most important parts of the project area for fauna are the somewhat degraded areas of woodland in the east and north-east of the site. This can be attributed to two factors. These are close to South and Bibra Lakes and therefore

movement of species such as some birds and Quenda (*Isoodon obesulus*) is likely to occur. In addition the vegetation along the east and north-east of the site is structurally complex”.

Bamford (2002) considered that the species that are most likely to be affected by clearing on the site include large predatory reptiles, such as the three goanna species, sedentary birds, such as fairy-wrens and thornbills, and the Brush-tailed Possum (*Trichosurus vulpecula*).

The site provides a habitat continuum from the wetland to upland vegetation communities.

### ***Viability and Condition***

Bennett (2000) mapped the vegetation condition of the site and found that "Most of Floristic Community Type 28 sampled at the site has the potential for long term viability. The southern section of this bushland was in Very Good to Good condition although there were areas that were highly degraded, mainly due to paper pulp being spread on the surface". No *Phytophthora cinnamomi* or *Armillaria luteobubalina* (armillaria) infestations were detected on the site. Most of the site is classified as uninfested with the exception of areas classified as uninterpretable (Reynolds reported in Welker 2002).

### ***Fragmentation and Connectivity***

The site links directly with the South Lake Bush Forever site. Bennett (2000) commented that "South Lake and the eastern edge of the Amcor site, is part of Greenways 75 and 90 and part of a regionally significant bushland/wetland linkage (Government of Western Australia, 2000). Bennett (2000) suggested that "consideration be given to maintaining this area as bushland and combining it with Beeliiar Regional Park".

Bamford (2002) observed that "because the proposed development does not lie between conservation areas but is effectively an outlier of a conservation area, the impact of fragmentation upon fauna will not be great." ... "Probably of more concern than such fragmentation will be the loss of upland woodland to fauna present in Beeliiar Regional Park. The woodland may provide seasonal food sources for mobile species such as some birds and probably mammals like the Quenda and Brush-tailed Possum. The woodland may also provide nesting sites for water birds such as some ducks that nest in tree hollows."

### **Submissions**

Submissions addressed the following views (see also Sections 3.2 to 3.4):

- (a) The intrinsic values of the bushland and its value to the local and wider community were not taken into account. The bushland should be protected in its entirety;
- (b) The site meets a number of Bush Forever criteria for regionally significant bushland and other criteria such as cultural significance, landscape amenity, recreation opportunities and research and scientific values;

- (c) Impacts include loss of biodiversity;
- (d) The bushland on the site is closely associated with the adjoining Beeliar Regional Park, thus enhancing the conservation value of both the bushland on the site and the Regional Park, and that this relationship/value had not been adequately recognised or addressed;
- (e) Insufficient cognisance had been taken of the Bush Forever recommendations with respect to Conservation Category Wetlands (South Lake) to:
  - provide a wildlife corridor between the wetland and upland;
  - provide or enhance feeding and/or breeding habitat for birds;
  - recognise the importance of fringing vegetation, and associated upland vegetation; and
  - maintain or enhance the ecological diversity of the wetland;
- (f) Support for an enlarged buffer to enhance habitat conservation and include more existing high value upland bushland in the reserved estate consistent with Greenways 75 and 90;
- (g) The rehabilitation programs will not provide habitat generation and preservation to support the ecological diversity of the South Lake wetland species, and more needs be set aside;
- (h) Opposition to proceeding with development due to the local and regional ecological values of the site, with a view to including it in its entirety in the conservation estate;
- (i) Loss of tuarts is of concern;
- (j) Opposition to proceeding with the development due to the abundance of alternative general industrial land available in the region; and
- (k) Support for the project to proceed from a commercial and social benefit perspective.

### **Assessment**

The area considered for assessment of this factor is the Swan Coastal Plain (System 6 and System 1 portions).

The EPA's primary environmental objective for this factor is, at a regional level, to:

- maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts;
- avoid adverse impacts on biological diversity, comprising the different plants and animals and the ecosystems they form, at the levels of genetic diversity, species diversity and ecosystem diversity; and
- maintain the integrity, ecological functions and environmental values of wetlands.

The focus of the EPA is on the protection of regionally significant natural areas. The EPA has accepted that Bush Forever is a way forward for the Government to preserve

regionally significant vegetation within the Swan Coastal Plain portion of the Perth Metropolitan Region. The EPA expects that Bush Forever will be implemented in accordance with the published Bush Forever (EPA 2003). The EPA expects that proposals impacting on locally significant natural areas in the area covered by Bush Forever will be dealt with in a manner that is consistent with the intent of the actions in Bush Forever regarding locally significant bushland (EPA 2003).

The EPA notes the advice of the Department of Planning and Infrastructure on the application of Bush Forever to Lot 502, as follows:

*“Lot 502 was assessed for inclusion in the draft Bushplan, in accordance with the criteria listed in Bush Forever Volume 1; Policies, Principles and Processes (pages 4 & 5) that includes:*

- *Representation of ecological communities;*
- *Diversity and rarity;*
- *Maintaining ecological systems or natural processes;*
- *Scientific or evolutionary importance; and*
- *General criteria for the protection of wetland, streamline and estuarine fringing vegetation and coastal vegetation.*

*Although the vegetation on some areas of the Lot 502 appeared completely degraded and/or extensively modified, it was considered to be typical of that from the Karrakatta Complex Central and South and the Bassendean complex - central and south, both of which have already been extensively cleared for development on the Swan Coastal Plain. After considering sites in the context of the assessment criteria, a further refinement of sites gave regard to the wider social and economic values of a particular land or resource, including land use zoning and the wider financial considerations of the government. In this instance, Lot 502 was considered to be significantly constrained by the existing zoning (Industrial) and was not considered further for inclusion in Bushplan.*

*After the site was excluded from the draft Bushplan, the City of Cockburn nominated a portion of the site for consideration in the final Bush Forever policy and the area was listed as a 'nominated additional area' (DPI 17, DEP 67c). It was nominated on the basis that the adjoining South Lake wetland did not have an adequate buffer, and that the vegetation on the ridge would provide landscape relief to an otherwise industrial sky-line. The vegetation was assessed for regional significance as part of this process and was considered as being consistent with the majority of the upland vegetation in the remainder of the Beeliar Regional Park uplands. The vegetation condition around the wetland was also noted as was the current land use zoning constraints. Wetland buffer issues or landscape relief were not key criteria in the selection of Bush Forever Sites, particularly as suitable wetland buffers are normally addressed through the planning process and are protected through other environmental policies. The boundary of the adjacent Bush Forever Site 254 in this location would have merely followed the existing Parks and Recreation reservation boundary as such lands were deemed to have an existing level of protection. Subsequently, at the Bushplan Co-ordinating Group meeting held on 7 July 1999, it was agreed to examine opportunities to preserve some vegetation and provide a buffer to the adjacent wetland through the industrial structure planning process and was not*

*further considered for inclusion in Bush Forever.*” (Correspondence from the Department of Planning and Infrastructure, October 2002).

The EPA also notes the intentions of Bush Forever with respect to the protection of the Karrakatta Central and South complex. Bush Forever states that:

*“.. the Karrakatta Central and South complex retains more than 10 per cent bushland at present but is substantially constrained by existing development proposals and Urban/Industrial Planning Zones, to the extent that the target is unlikely to be achieved. It is notable that this complex extends north from the Perth Metropolitan Region and there are better opportunities for conservation in these areas.”*(Government of Western Australia 2000)

The EPA expects that Bush Forever will be implemented in accordance with the above principle.

The EPA believes there would not be a significant effect on regional floral diversity as vegetation communities and individual species in Lot 502 are not regionally restricted. The reduction of the remnant vegetation of the Karrakatta Central and South complex of approximately 0.4% on the Swan Coastal Plain (System 1 and System 6 areas), and 1.0% in the Bush Forever area will not compromise the objectives of the EPA provided that the actions in Bush Forever with respect to the reservation of the Karrakatta Central and South complex in the larger region are implemented.

Having regard for the Bush Forever decision not to include Lot 502 in Bush Forever, the EPA considers that the issues of most significance relating to the bushland on the site are:

- The use of upland habitat on Lot 502 by fauna associated with South Lake and the adjoining Beeliar Regional Park;
- The presence of habitat on Lot 502 that some species of National and Regional Conservation Significance may utilise. The EPA notes the advice of Bamford that the species likely to be of most significance is the Short-billed Black-Cockatoo as this may forage on seeds of banksia species;
- The presence of habitat that is utilised by some species of special interest as listed in Bush Forever, eg fairy-wrens;
- The protection of the South Lake wetland buffer; and
- The landscape value of part of the site as a backdrop to Beeliar Regional Park.

These issues are addressed in more detail in the following sections of this report.

Following the public review period and meetings with the EPA, LandCorp revised its proposal to reflect key findings of the ecological studies. The modifications acknowledge the significance of the wetland – upland ecological associations around South Lake; the retention of areas of mature bushland and habitat around South Lake; and the maintenance of habitat for some species of special interest.

LandCorp extended the proposed buffer to South Lake to 214 metres from the edge of Lot 502. This results in the inclusion of valuable upland woodland in the south west

of the buffer. The development plan has been planned in a staged approach of 8 stages over a long time horizon. It is intended that, within this time, bushland rehabilitation in the areas to the south and west of South Lake will provide improved habitat for targeted species, and for ecological associations adjacent to the lake and Beeliar Regional Park. The proposal includes commitments to landscape and revegetate portions of the developed industrial estate progressively with local provenance native species. The EPA notes that the proponent has committed to developing a Rehabilitation and Bush Restoration Plan and a Landscape Protection and Management Plan to the requirements of the EPA on advice from CALM.

As the EPA considers that the issues of rehabilitation and landscaping are critical for the achievement of satisfactory environmental outcomes for the proposal (as discussed in subsequent sections of this report), the EPA recommends that rehabilitation and landscaping requirements are incorporated into conditions, as detailed in Appendix 4.

### **Summary**

Having particular regard to the findings that:

- (a) The site has been previously considered for inclusion in the conservation estate by Bushplan and Bush Forever, without inclusion;
- (b) The floristic communities on Lot 502 are not restricted to Karrakatta Central and South complex regionally, and are considered to be well reserved;
- (c) The reduction in the Karrakatta Central and South complex as a result of this project is 0.4% on the Swan Coastal Plain ( (System 6 and System 1 portions) and 1.0% of the Bush Forever area;
- (d) No endangered ecological community or declared rare or priority flora were identified at the site;
- (e) Following the public review period, the proponent has committed to adding a further 5 ha of upland vegetation to the conservation estate;
- (f) The proponent has committed to preparing and implementing a Rehabilitation and Bush Restoration Plan that requires the attainment of specified performance criteria;
- (g) The proponent has committed to implementing the proposal in a staged manner to maximize the maturation of rehabilitation and native landscaping to provide species diversity and habitat; and
- (h) The proponent has committed to preparing and implementing a Landscape Protection and Management Plan that specifies revegetation with native, provenance species;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor, provided that conditions are set specifying the requirements for the rehabilitation and landscaping plans, and that the rehabilitation performance criteria are met before the final Stages 7 and 8 are implemented, as recommended in the draft conditions in Appendix 4.

## 3.2 Fauna

### Description

The bushland on the site and its proximity to South Lake indicate that the site has significance for fauna. Fauna will be impacted by the progressive clearing of approximately 60 ha of native vegetation.

Four reports on the fauna of the site have been prepared by Bamford (Bamford 2000, Bamford 2001, Bamford 2002 and Bamford 2003) involving site surveys and research.

The EPA notes that there are possibly up to 147 vertebrate species, eleven of which are introduced species, utilising Lot 502. These possibly consist of eight species of frogs, 38 species of reptiles, 80 species of birds, and 16 species of mammals (11 native and five introduced) (Welker 2002).

Bamford (2000) found that the project area may be utilised by 8 species of threatened vertebrate fauna that are of National Conservation Significance. Of these species, however, Bamford considered that “..only the Short-billed Black-Cockatoo rates a high level of significance. It may rely on the woodland for foraging”. In addition 10 threatened invertebrate species are in the Perth region but it is difficult to predict their presence or abundance in the proposed development area. The site may be used by 9 species of regional significance.

The Bamford reports identify 26 bird species that are listed as significant birds of the Swan Coastal Plain Portion of the Perth Metropolitan Region in Table 15 of Bush Forever, as habitat specialists with a reduced distribution on the Swan Coastal Plain or which are wide ranging species with reduced populations on the Swan Coastal Plain (Government of Western Australia 2000).

The majority of species were considered by Bamford to be of local conservation significance in that the species could locally be severely impacted by the development. For birds, these included some habitat specialists such as the Splendid Fairy-wren (*Malurus splendens*), thornbills and Weebil (*Smicrornis brevirostris*).

The habitat types of Lot 502 include upland woodland dominated by eucalypts and banksias growing on sandy soil, cleared areas, and transitional areas.

Bamford (2002) found that the project area represent(s) almost half of all upland woodland in the South Lake to North Lake subregion of the City of Cockburn. As such the woodland on the site comprises a substantial portion of woodland habitat locally so the removal of upland habitat from the area may increase the risk of disappearance of some species that occur in low population densities from the City of Cockburn and adjacent area. “Species that are most likely to be affected include large predatory reptiles, such as the three goanna species, sedentary birds, such as fairy-wrens and thornbills, and the Brush-tailed Possum.”

Bamford (2002) reported “Observations on birds and mammals in particular suggest that the most important parts of the project area for fauna are the somewhat degraded areas of woodland in the east and north-east of the site. This can be attributed to two

factors. These are close to South and Bibra Lakes and therefore movement of species such as some birds and Quenda is likely to occur...In addition the vegetation along the east and north-east of the site is structurally complex". "The woodland fringing the cleared area near South Lake is of high value for fauna because it is close to the lake, has more structurally complex vegetation than some other areas of woodland and because such transitional regions are favored by some species."

Bamford (2002) reported "Because the proposed development does not lie between conservation areas but is effectively an outlier of a conservation area, the impact of fragmentation upon fauna will not be great." "Probably of more concern ..will be the loss of upland woodland to fauna present in Beeliar Regional Park. The woodland may provide seasonal food sources for mobile species such as some birds and probably mammals like the Quenda and Brush-tailed Possum. The woodland may also provide nesting sites for water birds such as some ducks that nest in tree hollows."

Bamford considered that impacts could be minimised through the retention of a wide buffer to the wetland, protection of upland vegetation within the buffer and the estate generally, the rehabilitation of the wetland buffer using endemic species and in a manner which enhances fauna habitat, staging of development, and the use of native species in landscaping within the estate.

### **Submissions**

Submissions addressed the following matters in relation to this factor:

- (a) The proposal did not adequately consider wildlife and species of conservation significance;
- (b) Support for protection of the entire site or an enlarged buffer to enhance habitat conservation and include more existing high value upland bushland in the reserved estate;
- (c) The bushland provides important habitat for some fauna associated with wetlands that require a mix of dry and wet habitats throughout their life cycle;
- (d) Mature trees are an important habitat and will be lost;
- (e) Concern was expressed about specific species. Some of these are the Brush Wallaby, Quenda, Common Sandpiper, Little Eagle, Carnaby's Cockatoo (Short-billed Black-Cockatoo), frogs, species at the southern end of their range;
- (f) Cumulative clearing of habitat in the region is of concern;
- (g) That insufficient cognisance had been taken of the Bush Forever recommendations with respect to Conservation Category Wetlands such as South Lake to:
  - Provide a wildlife corridor between the wetland and upland;
  - Provide or enhance feeding and/or breeding habitat for birds;
  - Recognise the importance of fringing vegetation, and associated upland vegetation as habitat; and
  - Maintain or enhance the ecological diversity of the wetland;



- (h) Concern that rehabilitation programs will take many years to develop mature habitat and not provide habitat generation and preservation to support the ecological diversity of the South Lake wetland species, and more needs be set aside;
- (i) Native gardens will not substitute the habitat provided by the upland vegetation;
- (j) CALM has indicated its support for rehabilitation in the buffer of South Lake, and its expectation that the rehabilitation be of a high quality; and
- (k) Support for the project to proceed from a commercial and social benefit perspective.

Many submission issues referred to in Section 3.1 are also relevant to this factor.

### **Assessment**

The area considered for assessment of this factor is the Swan Coastal Plain (System 6 and System 1 portions).

The EPA's primary environmental objective for this factor is, at a regional level, to maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts.

The focus of the EPA is on the identification of potential regionally significant impacts, and in this regard notes the following:

- The site has been considered through the Bush Forever process and is not required as part of a comprehensive regional system for the protection of fauna habitat;
- The site provides upland habitat for fauna species associated with the adjoining Beeliar Regional Park, the nearest parts of which lack quality upland habitat. Therefore there would be a benefit to the regional conservation system to retain some of the upland vegetation on Lot 502;
- The site provides habitat for wetland fauna species that rely on a continuum of vegetation types between wetland and upland;
- The site provides habitat that some species of National and Regional Conservation Significance may utilise. The EPA notes the advice of Bamford that the species likely to be of most significance is the Short-billed Black-Cockatoo as this may forage on seeds of banksias; and
- The site provides habitat for some species of special interest as listed in Bush Forever eg habitat specialists with a reduced distribution on the Swan Coastal Plain such as fairy-wrens.

The EPA considers that its objectives for fauna can be met by the protection of some mature woodland upland habitat within the buffer adjoining South Lake, to complement the values of the Beeliar Regional Park and to protect ecological values associated with South Lake. Values associated with South Lake and Beeliar Regional Park may also be enhanced by complementary management actions including rehabilitation and landscaping both within the proposed buffer and in the estate.

The EPA further notes that there is a likelihood that the majority of species at the local level are likely to be severely impacted, and that this is acknowledged to be of high concern to the community.

Whilst the focus of the EPA is on the protection of environmental values at the regional level, the EPA encourages the protection of local values. Accordingly, the EPA has encouraged the proponent to improve on the environmental performance of the original proposal.

Following the public review period and in consultation with the EPA, the proponent has modified its proposal and commitments to improve environmental outcomes, as follows:

- (a) LandCorp has revised its proposal and has extended the proposed buffer to up to 214 metres from the boundary of Lot 502. This results in the inclusion of significant upland woodland with high value in the south west of the buffer;
- (b) Rehabilitation of 5 ha of degraded land in the buffer on Lot 502, and 10 ha in the Beeliar Regional Park on the south side of South Lake is proposed, in accordance with the Rehabilitation and Bushland Restoration Plan; and
- (c) LandCorp has proposed a staged approach to development to ensure that the rehabilitation will have reached sufficient maturity to effectively provide habitat and refuge before the commencement of works on the final stages of the development.

LandCorp retains its previous commitment to landscape the industrial estate with native species to promote fauna habitat, as studies indicate some reptiles and birds will persist in developed areas.

The EPA notes that the additional upland buffer will provide fauna habitat that cannot be readily or quickly created through rehabilitation. The proposed development line will retain a buffer strip of mature woodland in most places over 50 metres wide. It will take many decades for the proposed rehabilitation area to provide such habitat trees, so inclusion of the upland areas in the extended buffer will complement the habitats that can be created by rehabilitation. In addition, the buffer will provide habitat that is slightly higher in the landscape and is therefore intrinsically different from that which can be created in the rehabilitation area around South Lake. The proposed buffer includes all the tree species that make up the woodland throughout the development area, including a range of banksia and eucalypt species. The range of tree species is important, as species often have different flowering times and therefore the combination of species can provide food sources for nectar-dependent fauna across the year. The combination of lowland rehabilitation and upland buffer will provide a variety of fauna habitats and a sequence of habitats from the lake's edge. The combination and sequence of habitats will maximise the number of fauna species that can be supported in the rehabilitation and buffer areas. Rehabilitation around South Lake will create habitat of dense, riparian vegetation and adjacent woodland that is currently badly degraded (from Bamford 2003).

The EPA considers that the area proposed for rehabilitation (15 ha) is similar in size to the "panhandle" section of the industrial site (Stage 6, Figure 2), and should be able to replace this section as fauna habitat. Vegetation in the area identified as "high

value fauna habitat” by Bamford in the “panhandle” is partially degraded but is valuable for fauna, particularly species that have declined in the Perth region, including the Quenda or Southern Brown Bandicoot, and the Splendid Fairy-wren.

The vegetation structure in the “panhandle” is particularly important for fauna because it includes dense shrubs and low trees that provide food and cover, and this structure could be recreated in the rehabilitation area within a period of 5-10 years. Rehabilitation around South Lake will have the added benefit of contributing to the integrity and linkage within Beeliar Regional Park.

The EPA considers that the issues of high quality rehabilitation, staging of the development to tie in with the achievement of rehabilitation criteria, and landscaping to meet performance criteria are critical to the achievement of satisfactory environmental outcomes for the proposal. Accordingly, the EPA recommends that rehabilitation and landscaping requirements are incorporated into conditions, as detailed in Appendix 4.

These requirements include:

- A list of topics for rehabilitation performance criteria that will have to be developed and met;
- The proponent will report the progress and effectiveness of the Rehabilitation and Bush Restoration Plan at the completion of each stage of the development;
- The EPA will review the effectiveness of the Rehabilitation and Bush Restoration Plan prior to authorising commencement of the final stages of the development (Stages 7 and 8, Figure 2); and
- Landscaping criteria to be developed to include the provision of habitat for fauna and plantings based on local provenance.

## **Summary**

Having particular regard to:

- (a) The advice of the Department for Planning and Infrastructure that the site has twice been considered but is not required to fulfil the regional conservation strategy, Bush Forever;
- (b) The finding that no species are expected to be reliant on Lot 502 for their persistence in the region;
- (c) The main regional values of the site for fauna being the provision of upland habitat that complements that in the Beeliar Regional Park, the provision of a continuum of habitats adjoining South Lake that maintain ecological values associated with South Lake, and the provision of habitat used by significant species of the Swan Coastal Plain portion of the Perth Metropolitan Region, as listed in Bush Forever;
- (d) The commitment by the proponent to expand the buffer area up to 214 metres wide to include upland vegetation with mature trees that are likely to contain nesting and roosting hollows and crevices;

- (e) The commitment by the proponent to developing the site in a sequential manner to give sufficient time for some fauna to move into neighbouring remnant areas and occupy habitats in the rehabilitated areas and native gardens in the developed parts of the estate;
- (f) The commitment by the proponent to carry out rehabilitation in the buffer on Lot 502 and in Beeliar Regional Park, with a focus on providing habitat for targeted species such as quenda, the Short-billed Black-Cockatoo, and fairy-wrens;
- (g) The commitment by the proponent to prepare and implement a Landscaping Plan for the estate to include the provision of habitat for native fauna;
- (h) Support by CALM for rehabilitation of the buffer of South Lake, and its expectation that the rehabilitation be of a high quality; and
- (i) The proponent's commitments that are designed to go towards maintaining some locally significant fauna values;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for fauna, provided that conditions are set specifying the requirements for the rehabilitation and landscaping plans, and that the rehabilitation performance criteria are met before the final Stages 7 and 8 are implemented, as recommended in the draft conditions in Appendix 4.

### **3.3 Protection of South Lake and wetland buffer**

#### **Description**

South Lake lies within Beeliar Regional Park and Bush Forever Site No. 254. The lake is subject to the environmental protection requirements of the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*. South Lake is allocated the wetland management categories of Resource Enhancement and Multiple Use on the State wetland mapping database maintained by the Water and River Commission (WRC).

The eastern boundary of the South Lake wetland straddles the boundary of Lot 502.

The subdivision of Lot 502 has the potential to impact on the values associated with South Lake and its buffer through the clearing of vegetation that supports the fauna and other ecological values associated with South Lake. The subdivision also has the potential to impact on the landscape and visual amenity values associated with the wetland, and on the water quality that supports the wetland. The environmental factors fauna, landscape values and drainage management are addressed more fully in Sections 3.2, 3.4 and 3.6.

A buffer of 150 m from the edge of the high water mark (over 50 metres from the edge of the wetland dependent vegetation) was originally proposed in the PER document. On Lot 502, much of this buffer is degraded to completely degraded. LandCorp's commitments in the PER document included the rehabilitation of this area with upland vegetation. Upland bushland around wetlands increases their ecological diversity as some species move between these habitat types. In the PER document, the proponent also committed to rehabilitating 10 ha on the south side of

South Lake. The upland bushland on the South Lake Bush Forever site is in a degraded condition with only small high-value remnants remaining (Bennett 2000).

### **Submissions**

The submissions indicate that significant concern was held regarding the degraded nature of the buffer and the ability of efforts to rehabilitate areas of the buffer to the west and Beeliar Regional Park to the south of South Lake in a timely manner to provide habitat offsets for those lost through clearing and development. Many submissions stressed the value of upland vegetation for the maintenance of fauna habitat and ecological diversity around South Lake. A submission by the City of Cockburn referred to the City's Bushplan submission that sought protection of the buffer to the ridgeline some 200 metres from South Lake. Other submissions referred to the need for the protection of landscape values around South Lake, and the protection of water quality (see Sections 3.4 and 3.6).

### **Assessment**

The area considered for assessment of this factor is South Lake and its buffer.

The EPA's environmental objective for this factor is to maintain and enhance the integrity, ecological functions and environmental values of South Lake.

The EPA considers South Lake to be a significant wetland as it is in the Beeliar Regional Park, a Bush Forever site, and is subject to the provisions of the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*.

Protection of the environmental values and functions associated with a significant wetland requires the protection of a buffer around the wetland. The Water and Rivers Commission (WRC) as the agency with primary responsibility for advising on wetland issues, outlines the role of wetland buffers as follows:

*"Buffers are designed to protect wetlands from potential deleterious impacts while helping safeguard and maintain ecological processes and function within the wetland and wherever possible in the buffer."* (WRC 2001).

The WRC position statement on wetlands (WRC 2001) advises that required buffer distances for wetlands will vary, with the minimum buffer normally applied being 50 m from the edge of the wetland dependant vegetation. Depending on the management measures adopted WRC recommend a larger buffer for industrial development. WRC accepted the previous buffer for Lot 502.

The EPA notes that following the public review period and consultation with the EPA, the proponent has expanded the buffer as shown on Figure 3, to include mature upland vegetation. The biological reports on the site clearly indicate the benefits of a continuum of vegetation types adjoining the wetland, extending to mature upland woodland, to maintain the ecological diversity of the wetland.

The proposed buffer extends to a maximum of approximately 240 m from the edge of the wetland, as mapped by WRC. The modified buffer was selected to improve a

number of environmental outcomes. These particularly include improved outcomes for fauna as discussed in Section 3.2 to complement key wetland and Beeliar Regional Park values, and landscape amenity, as discussed in Section 3.4.

The EPA further notes that the proponent has committed to rehabilitation of approximately 15 ha of degraded land in the buffer, and ceding of the portion of the buffer on Lot 502 to the conservation estate. The proponent has altered the sequence of development of the stages of the subdivision since the public review period. The staged approach to development with Stages 7 and 8 adjoining the buffer to be developed last, is designed to ensure that the rehabilitation will have reached sufficient maturity to effectively provide habitat and refuge before the commencement of works on the final stages of the development.

The EPA considers that the issues of rehabilitation, staging of development and landscaping are critical for the achievement of satisfactory environmental outcomes for the proposal. Accordingly, the EPA recommends that rehabilitation, final staging and landscaping requirements are incorporated into conditions, as detailed in Appendix 4.

### **Summary**

Having particular regard to the:

- (a) Proponent's modified commitments following the public review period to expand the buffer on Lot 502 to include mature upland woodland, and to stage the development such that Stages 7 and 8 adjoining the buffer are developed last; and
- (b) Proponent's commitments to rehabilitate 15 ha within the buffer of South Lake, and to cede the portion of the buffer on Lot 502 to the conservation estate;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor provided that conditions are set specifying the rehabilitation requirements, and compliance with the rehabilitation criteria before final Stages 7 and 8 are implemented, as specified in the draft conditions in Appendix 4.

## **3.4 Protection of landscape values**

### **Description**

Lot 502 is located immediately up-gradient of the western side of South Lake and is perceived as an important landscape "backdrop" to the lake and Beeliar Regional Park, particularly when viewed from the east and south-east. The PER (Welker 2002) found that South Lake and the eastern side of Lot 502 represent an area that could be considered of high scenic quality under the Department of Conservation and Land Management's visual landscape grading.

The subdivision and subsequent development for industrial purposes has the potential to diminish the landscape values of the area given its location and scale.

Viewshed analysis undertaken for LandCorp indicated that the subdivision design and proponent commitments should ensure the retention of the landscape values of the South Lake and Beeliar Regional Park, with development on the site only being partially visible from the east.

In the PER document (Welker 2002), the proponent proposed to protect landscape values by retaining a buffer next to South Lake to be capped by a landscaped bund, rehabilitation south of South Lake, and the preparation and implementation of a Landscape Protection and Management Plan.

### **Submissions**

Several submissions raised concerns regarding the potential for the industrial development to be visible when viewed from the east. Many submitters sought the retention of the native vegetation on the entire site. Some sought wider buffers, higher up the landscape with augmented screening. A greenbelt entry statement adjoining North Lake Road was raised by the City of Cockburn.

### **Assessment**

The area considered for assessment of this factor is the viewscape from the Beeliar Regional Park.

The EPA's environmental objective for this factor is to ensure, as far as practicable, that the landscape values and visual amenity of the development are consistent with those of the Beeliar Regional Park.

Following the public review period and consultation with the EPA, LandCorp made further modifications to the design of the proposal and to their commitments. These have the effect of enhancing visual amenity around South Lake in the Beeliar Regional Park, and reducing the potential visual impact of the development when viewed from Beeliar Regional Park. The modifications include the retention of some upland woodland high in the landscape in a widened buffer extending to approximately 214 m west of South Lake. The proponent has committed to rehabilitating degraded areas within the buffer area on Lot 502, retaining remnant vegetation along the north-eastern boundary, rehabilitating the southern area of the South Lake reserve, staging the implementation of the development so that stages adjoining the buffer are developed last, and preparing and implementing a Landscape Protection and Management Plan. The Landscape Protection and Management Plan will provide for the reintroduction of local flora and habitat into the subdivision, the control of building heights and colours, and landscape screening and planting at the eastern entry to the development.

The EPA considers that the issues of rehabilitation, staging and landscaping are critical for the achievement of satisfactory environmental outcomes for the proposal. The EPA therefore recommends that rehabilitation and landscaping requirements are incorporated into conditions, as detailed in Appendix 4.

## **Summary**

Having regard for the proponent's revised subdivision design and commitments, as follows:

- (a) The buffer line being higher in the landscape due to increased distance to the west from South Lake, and to include high landscape quality upland woodland;
- (b) The rehabilitation of 5 ha in the buffer area;
- (c) The rehabilitation of 10 ha on the south side of South Lake;
- (d) The preparation and implementation of a Landscape Protection and Management Plan; and
- (e) The staged approach to undertaking the development to allow the rehabilitation to attain maturity prior to clearing stages 7 and 8;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for the protection of landscape values.

## **3.5 Site contamination**

### **Description**

The current and historical use of the site for paper manufacturing operations has resulted in site contamination at some locations in Lot 502. This has occurred through the spray irrigation of effluent and paper pulp into storage areas, and the use of landfill and effluent storage ponds.

The proponent has committed to preparing a Soil and Groundwater Contamination Management Plan prior to development of the site. The Plan will involve procedures for the following actions to be carried out prior to the development of the relevant areas of the estate:

- decommissioning of effluent ponds and landfill sites prior to development; and
- removal of some solid waste and contaminated soil from previous landfill containing elevated levels of petroleum hydrocarbons and copper prior to estate development. (The proponent proposes that some solid waste in the current landfill site will remain in-situ.)

The ongoing use of the effluent ponds for the next five years is not expected to further degrade groundwater quality. Following the removal of the effluent ponds, the quality of the groundwater down gradient of the area and the oxygen deficient plume is expected to self-remediate. The contamination from this source is not expected to exceed guideline levels over time.

The proposal in itself is not anticipated to cause site contamination. Enterprises establishing in the new estate will transport, store and dispose of chemicals and solvents according to relevant legislation, regulations and license conditions, such that potential soil and groundwater contamination from these sources is prevented.



## **Submissions**

Several submissions indicated concern that the clean-up of a contaminated site should not be contingent upon a development proposal proceeding. This site should be cleaned up as soon as possible regardless of this proposal. The landfill material should be removed and the effluent ponds should be decommissioned, and any contamination should be cleaned up. It is of concern that the effluent disposal area considered to have low levels of contamination is being proposed as Public Open Space. Concern was expressed about the removal of trees that could be containing the liquid pollution, and about the potential spread of polluted soil through transportation to other sites. The issue of ownership of the public open space proposed over the waste disposal site and the potential health risk was raised by the City of Cockburn.

## **Assessment**

The area considered for assessment of this factor is the area of soil and groundwater contamination associated with Lot 502.

The EPA's primary environmental objective for this factor is to ensure that remediation achieves an acceptable standard compatible with the intended land use and ecosystem maintenance, and consistent with appropriate criteria.

A preliminary site contamination assessment has been undertaken on behalf of LandCorp and has been reviewed by the Department of Environmental Protection (DEP). The contamination present is considered manageable and the proponent has committed to the preparation and implementation of a Soil and Groundwater Contamination Management Plan. The Plan is to be prepared to the satisfaction of the DEP prior to the first stage of clearing and construction.

## **Summary**

Taking into account the:

- (a) preliminary site contamination assessment that has been undertaken on behalf of proponent, and has been reviewed by the DEP; and
- (b) the proponent's commitment to prepare and implement a Soil and Groundwater Contamination Management Plan to the satisfaction of the DEP.

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

## **3.6 Drainage Management**

### **Description**

Lot 502 adjoins South Lake. Run-off and infiltration from the construction site and future industries operating on the subdivision have the potential to cause unacceptable impacts on South Lake, the fringing wetlands and Beeliar Regional Park, through surface and groundwater flows. LandCorp was requested to address the management of drainage from the estate to ensure that water quality within the lake is not reduced.

A preliminary investigation into the development of a stormwater drainage system in the subdivision was conducted by the proponent. The report confirmed that drainage could be managed such that no surface run-off from the estate would reach South Lake. While groundwater flow is westerly and away from the lake, surface run-off needs to be managed to ensure that it is directed away from the lake.

### **Submissions**

Submissions raised concerns about uncontrolled drainage and infiltration having the potential to cause unacceptable impacts on South Lake, the fringing vegetation and the Jandakot Mound through surface and groundwater flows. The Water and Rivers Commission sought that the proponent commit to and modify the proposal to incorporate total water cycle management concepts ie Water Sensitive Urban Design principles.

### **Assessment**

The area considered for assessment of this factor is the water catchment of South Lake.

The EPA's environmental objectives for this factor are to:

- Maintain the quality of water so that existing and potential environmental values including ecosystem maintenance are protected; and
- Ensure stormwater drainage from the industrial subdivision does not adversely impact on the water quality of South Lake and the Beeliar Regional Park.

Guidance for the protection of water quality is provided in the EPA Draft Guidance No. 26 *Management of Surface Run-off from Industrial and Commercial Sites* (EPA 1999) and in Water and Rivers Commission guidelines.

The EPA notes that while Lot 502 adjoins the western fringe of the Jandakot Mound Environmental Management Area Category B, groundwater flow is in a westerly direction away from South Lake and the fringing wetlands. While the EPA recognises that this flow mitigates against impacts on the South Lake from infiltration, surface water run-off requires appropriate management to ensure that no adverse impacts emanate from the industrial development.

The EPA further notes that the proponent has committed to prepare and implement a Drainage Management Plan in accordance with Water Sensitive Urban Design principles and the EPA Draft Guidance No. 26 (EPA 1999) and that this plan will be developed in consultation with the Water and Rivers Commission, the City of Cockburn and the Department of Conservation and Land Management.

### **Summary**

Taking into account that:

- (a) The groundwater flow is in a westerly direction away from South Lake and fringing wetlands in the Beeliar Regional Park; and

- (b) The proponent's commitment to prepare and implement a Drainage Management Plan incorporating Water Sensitive Urban Design principles to the satisfaction of the Water and Rivers Commission, the City of Cockburn and the Department of Conservation and Land Management;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor.

## 4. Conditions and commitments

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal and, following discussion with the proponent, the EPA may seek additional commitments. The commitments, modified if necessary to ensure enforceability, then form part of the conditions to which the proposal should be subject, if it is to be implemented.

### 4.1 Proponent's commitments

The proponent's commitments as set in the PER and subsequently modified, as shown in Appendix 4, should be made enforceable.

### 4.2 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Western Australian Land Authority trading as LandCorp to subdivide Lot 502 North Lake, Sudlow and Phoenix Roads, for industrial and mixed business purposes in the Bibra Lake area is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) That the proponent be required to fulfill the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 4;
- (b) That, prior to implementation of the proposal, the proponent shall develop a Rehabilitation and Bush Restoration Plan, as specified in Condition 6-1;

- (c) That, prior to implementation of the proposal, the proponent shall develop a Landscape Protection and Management Plan, as specified in Condition 7-1;
- (d) That the proponent shall implement the Rehabilitation and Bush Restoration Plan and the Landscape Protection and Management to the requirements of the Minister for the Environment and Heritage on advice of the EPA;
- (e) That the proponent shall submit a performance review report to the EPA, prior to the commencement of each of Stages 2 to 8 of the development (as shown in Figure 1 Schedule 2 in Appendix 4);
- (f) That the proponent shall submit a detailed performance review report at the finalisation of Stage 6 (as shown in Figure 1 Schedule 2 in Appendix 4) that demonstrates the achievement of the criteria specified in the Rehabilitation and Bush Restoration Plan to the requirements of the Minister for the Environment and Heritage on advice of the EPA; and
- (g) The proponent shall demonstrate that the performance criteria detailed in the Rehabilitation and Bush Restoration Plan have been achieved prior to commencing any clearing or ground breaking activities associated with the development of Stages 7 and 8 (as shown in Figure 1 Schedule 2 in Appendix 4).

## 5. Other advice

### 5.1 Public consultation

In referring the proposal back to the Environmental Protection Authority, the Minister for the Environment and Heritage required that the proposal be assessed more fully and publicly.

In undertaking the Public Environmental Review, the EPA notes that the proponent conducted:

- Briefings and discussions with Government agencies; and
- Briefings and independently facilitated interactions with key community stakeholders; and mail out to the residents of St Paul's Estate, north of Lot 502.

Details of the consultation process and those consulted is outlined in Section 2 of the PER (Welker 2002).

Some submissions were very critical of the consultation and the way it was presented in the PER. However, the EPA believes the consultation process has been sufficient for the Public Environmental Review purposes to enable all views to emerge and to be placed before it.

As part of the public review process, the EPA notes that approximately 360 submissions were received in relation to the project (Appendix 5).

It is the EPA's opinion that the requirement for a full and public assessment has been achieved for this factor.

## 6. Conclusions

The EPA has considered the proposal by the Western Australian Land Authority (trading as LandCorp) to subdivide Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake.

### *Bushland, fauna, wetland buffer and landscape protection*

The EPA notes that the bushland on the site is not required for the purposes of Bush Forever. The EPA has accepted that Bush Forever is a way forward for the Government to preserve regionally significant vegetation within the Swan Coastal Plain portion of the Perth Metropolitan Region.

The EPA notes that the vegetation on the site is of the Karrakatta Central and South complex, that Bush Forever proposes to protect less than the target level of 10 % of that complex in the Bush Forever study area, and that Bush Forever considers that there are better opportunities for conservation of that complex to the north of the metropolitan area. The EPA notes that the floristic communities on the site are not restricted to the Karrakatta Complex Central and South complex, and are considered to be well reserved.

The focus of the EPA is on the protection of regionally significant natural areas. In the absence of the site being required for Bush Forever, the EPA considers that the main values of the bushland on the site relate to its proximity to the Beeliar Regional Park and South Lake, and are as follows:

- The presence of upland habitat likely to be used by fauna associated with South Lake and the adjoining Beeliar Regional Park;
- The presence of habitat on Lot 502 that some species of National and Regional Conservation Significance may utilise, though no species is likely to be dependent on Lot 502 for its persistence in the region;
- The presence of habitat that is utilised by some species of special interest;
- The provision of a buffer to protect the values of South Lake; and
- The landscape value of part of the site as a backdrop to Beeliar Regional Park.

The EPA also notes that the removal of bushland from the site is of high concern to the community. Whilst the focus of the EPA is on the protection of environmental values at the regional level, the EPA encourages the protection of local values.

Following the public review period and in consultation with the EPA, the proponent has modified its proposal and commitments to improve environmental outcomes.

It is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for these factors subject to the satisfactory implementation of the proponent's commitments to cede a buffer around South Lake for Regional Park purposes as shown on Figures 2 and 3 that includes mature upland vegetation, rehabilitation of 15 ha of degraded land in the buffer immediately to the south and

west of South Lake, the preparation and implementation of a Rehabilitation and Bush Restoration Plan and a Landscape Protection and Management Plan, and the staging of the subdivision so that the rehabilitation in the buffer is of sufficient maturity prior to commencement of clearing of the final two stages (Stages 7 & 8 as shown in Figure 2).

#### ***Site contamination***

The EPA has concluded that contamination of portions of the site as a result of paper manufacturing operations is manageable and notes that the proponent has committed to the preparation and implementation of a Soil and Groundwater Contamination Management Plan.

#### ***Drainage management***

The EPA has concluded that stormwater drainage from the industrial subdivision can be managed to prevent adverse impacts on the water quality of South Lake and the Beeliar Regional Park. The EPA notes that the groundwater flow is in a westerly direction away from South Lake and that the proponent has committed to prepare and implement a Drainage Management Plan.

The EPA has concluded that the proposal is capable of being managed in an environmental acceptable manner such that it is most unlikely that the EPA's objectives would be compromised, provided that is satisfactory implementation by the proponent of the recommended conditions set out on Section 4, including the proponent's commitments.

## **7. Recommendations**

The EPA submits the following recommendations to the Minister for the Environment and Heritage:

1. That the Minister notes that the proposal being assessed is for the subdivision, in a staged manner, of Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

# **Appendix 1**

**List of submitters**

The following organizations and individuals made submissions with regards to the proposal

**Organisations (Reports)**

Ms Jean Halse, Canning River Regional Park Volunteers Inc  
A/Executive Director, Department of Conservation and Land Management  
Chief Executive Officer, Water and Rivers Commission  
Ms Rachel Siewert, Coordinator, Conservation Council of Western Australia  
Ms June Butcher, Kanyana Wildlife Rehabilitation Centre (Inc)  
Mr Jim Scott MLC  
Director Environmental Planning, Department for Planning & Infrastructure  
Director General, Department of Mineral & Petroleum Resources  
Mr Philip Jennings, Wetlands Conservation Society (Inc)  
Mr A G Thomson, Urban Bushland Council  
Ms J Payne, Waterbird Conservation Group  
Ms R Drummond, Friends of Brixton Street Wetlands  
Mr P Robertson, Western Australian Forest Alliance  
Mr B Moyle & Ms S Wooller, Wildflower Society of Western Australia  
Mr J Marston, Yangebup Progress Association (Inc)  
Mr R Davis, Birds Australia WA Conservation & Research Committee  
W S Sashegyi, Chamber of Commerce & Industry WA  
Chief Executive Officer, City of Cockburn  
Mr R Bropho, Combined Swan River & Swan Coastal Plains Native Title Claimants  
Commissioner for Aboriginal Planning, Department of Indigenous Affairs  
Ugo De Marchi, Coolbellup Community Association  
Neil Goldsborough, Friends of North Lake

**Individuals (Reports)**

I Morley  
Ms Julie Baker,  
S J Reynolds  
Mr David Lombardo  
Mr Richard Pawluk  
Ms Ann Sutton Babel  
Mr S & Mrs M Telford  
Ms Margaret Wilson  
Mr Darryl James  
Mr D Griffiths  
Ms J Lyon  
Ms J Powell  
Ms R Wright  
Ms D Matthews  
Ms J Payne  
Mrs L Crosling  
Mr A Wardle & Ms S Grey-Smith  
Mr J A Kitching  
Ms P Scott  
R Leeden,



Mrs R D Johnson  
Mr P J Reeves  
Mr P Coxon  
Barry & Jocelyn Calverley  
Mr Peter Reid

**Individual Letters and Pro-forma's**

**NOTE:** the EPA Service unit was unable to identify the authors of a further 19 letters, the contents of which have been taken into account during the assessment.

Ms June Booth  
Ms Hayley O'Connor  
Ms Maria Trimboli  
K Frankish  
J Holderhesse  
V Haval  
Ms Kristen Cooper  
Ms Michelle Paul  
Ms Doris Fricke  
Ms Christine Churcher  
Ms Annette Ritchie  
Mr Gerald Kock  
L Trotman  
Ms Vivian Markovich  
Ms Gail Sherback  
Ms Margaret Reale  
Ms Vanessa Fountain  
Ms Fiona Komar  
Ms Vicky Hartill  
Ms Sheena Cockman  
V E Fenning & J C Molloy  
Mrs Bell  
Mr Lomond H Bell  
Ms Diane M Dean & Mr Terence K Dean  
Mr Tony Caulfield  
Ms Fiona Mcvey  
Ms Christine Cregan  
G F Smith  
Ms Dianne Lee  
K D Burgell  
Mr J Stephenson  
Mr Sam Brown  
Mr Mark Burge  
Mr Leslie Costa  
Ms Irene Baker  
Ms Trish Watson  
Ms Olwen Maddock  
Ms Maureen Maloney  
C D James  
Mr Jim Perrie  
Mr Ian Cullen

J Conroy  
Mr Paul Snellgrove  
M E White  
Ms Natasha Feszczur  
Ms Ann Lean  
Ms Jo Bisschops  
J M Edwards  
Ms Sabrina Hahn  
Mr Brett Gillies  
F Martin  
Ms Dianne Cullen  
Mr Scott Benjamin  
Ms Joyce Payne  
The Gleeson Family  
N & A Hart  
J Read  
Ms Edna Wostall  
Master Michael Symes & E M Bonsall  
J Mclaughlin  
Ms Maureen Watson  
Ms Ronda Fomiatti  
Mr Dariusz Dziuba  
Ms Greta Mayo  
Mr Raymond Gray  
Mr Warren W Salkilld  
Mr David A Young  
Pat Nicholson  
Mr William Tate & Ms Joy Tate  
H Palmer  
Mr Ken Miller & Ms Angelique Malcolm  
Ms Grace Green  
Ms Angela O'connor  
Ms Kayoko Okuzono  
Ms Kylie Wilshusen  
Ms Maureen Cotterell  
Ms Giuliana Resmini  
Ms Jennifer Moyles  
Mr Kevin Salmon  
Mr Kevin Hull & Ms June Hull  
Ms Denyce Rowe  
Mr Jay Walsh & Ms Dorinda Hookings  
M J & K R Ebbs  
Ms Helen Potkura  
T Mcdade  
Ms Frances Thomas  
W J & J A O'hehir  
Mr Bruce Culver  
K Back  
Ms Caryn Hinchliffe  
J E & T R Smith

Mr Tony Martinan  
D McDonald  
B Smith  
Mr Nigel Street  
Ms Sally North  
Mr Joshua Critch  
Mr Barry Critch  
Mr Derek Sloman & Ms Roslyn Sloman  
M Symes  
Ms Kathleen Samuel  
Ms Valerie Overton  
Mr Steven Ucich  
Mr Alan Blacklock  
Mr Don Karger  
Mr John Sonsee & Ms Dorothy Sonsee  
Mr Edward S Gin  
Ms Elaine Hollands  
Ms Val Waldron  
Ms Elsie Dagostino  
D Doherty  
Ms Lois Woodland  
Mr Kevin Young & Ms Anne Young  
F G Cooper  
Ms Joyce Pagan  
Ms Winifred Mclean  
Ms Thelma Drake  
Mr David Miller  
Ms Coral Wood  
R K & E M Riley  
Mr F L Owen & Mrs Joyce Owen  
Ms Margaret Elliss  
E R Radford  
Mr A Rule  
S Bonham-Smith  
Ms Ella Doherty  
D Weary  
Ms Elizabeth Mann  
Ms Jane Maw  
W J Noorman  
Ms Gloria Davy  
Mr Thomas Cox & Ms Olive Cox  
D & C Findlay  
Mr Jason Critch  
Mr Greg Howard  
Mr Tim Seats & Ms Lorri Seats  
Ms Rose Ryan  
Mr T Vincent & Ms S J Vincent  
L Hardy  
G Wilkie  
B R Chauhan

Ms Barbara M Smith  
Ms Maureen Green  
S Newcombe & D Tomanic  
Mr Jack Strawbridge  
J M & A Fitch  
Mr Craig Critch  
N Sirois  
Ms Barbara Rissman  
R Stafford  
A Pether  
Mr Brad Mccracken  
Ms Terri George  
Mr Robert Bradley & Ms Alma Bradley  
Mrs Carolyn Thomas  
E Benbow  
Mr Raimond Orifici  
Mr Robert Humphries  
J Lyons & K Barnes  
Mr Steven Rea  
Mr Steve Johnson  
Mr Stephen Mustard  
J E Connolly  
Ms Natasha Rothwell & Mr David Lloyd  
D J Duffy  
Ms Jenifer Angwin  
Ms Suzanne Miller-Mustard  
Ms June Heidrich  
Ms Judy Ludlam & Mr Graham Ludlam  
Ms Vanessa Garbin  
Ms Vera Higgins  
Ms Ilona Milliner  
W G Mathews  
S Forbes  
Ms Maureen Pflugmacher  
Mr John Muir & Ms Mary Muir  
Mr Claude Iannello  
Ms Hilary Pilsworth  
Ms Tania Morri  
Ms Joy Horne  
Ms Gail Arnold  
C H Terwindt  
Ms Ida Griffin  
Mr Ken Hicks  
K Evans  
Mr Geoff Bathgate & Ms Nancy Bathgate  
Mr Alexander Kitts & Ms Pauline Kitts  
F & V Miragliotta  
Ms Eileen Evans  
E A Rowe  
Ms Samantha Rainsford

Ms Anne Johnson & Mr Andrew Johnson  
Cheng Shuit Wai  
Ms Louise Rwnhart  
Mr Stephen Clarke  
The Nicholls Family & L Anderson  
Mrs E M Johnston  
Mr Siddhartha Jha  
M Pilatti  
Ms Sheila Jackson  
Ms Robyn Walker  
L Whalley  
K Sullivan  
Ms Olivia Mcgrath  
R Young  
Ms Deirdre Macdonald  
S Beauchamp  
Ms A Hiddins  
Mr Keith Hutchings  
Ms Judy Gray  
A R Chapman  
Ms Janet Leather  
J F & Archibald  
Mr Matthew James  
Mr Stephen Hampson & Ms Kylie Hampson  
Ms Liz Crimmins  
A Padovan  
Ms Deb Williams  
Ms Nicola Waller  
Mr Frank Pinner  
Mr Steve Champion  
Ms Anne Mccomb  
Ms Jacqueline Mitchell  
Ms Samantha Brown  
Ms James Flowers  
Ms Joan Sharper  
Ms Wendy Dillon  
J H Goss  
Ms Kelly Smith & Mr Bart Gabriel-Borowski  
A Pether  
Mr Wayne Russell & Ms Sandra Russell  
Ms Janet Newbold  
Ms Ella Doherty  
Mr John Gorham & Ms Margaret Gorham  
Ms Susan Tonge  
Mrs June Bennett  
F Tonge  
Mr Darryl James  
Mr Gregory Smith  
Mr Andre Smeda  
L M Frayne

A Bradshaw  
R Isgar  
Mr Arthur Webster & Ms Margaret Webster  
E J Seaman  
Mrs S Y Nicklin  
Ms Ann Waterfield  
Ms Nicole Marshall & Mr Norman Marshall  
Mr Beau O'loughlin  
C J & J L Smit  
Ms Geraldine Stanton  
Ms Lois Romanoff & Ms Kim Leather  
Ms Frances Ryce  
Ms Alana Mcnee  
W Babel  
Ms Jaye Lee Snowden

## **Appendix 2**

### **References**

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Weston, A.S. (2000) *Spring Rare Flora Search LandCorp Property West of Bibra Lake City of Cockburn* draft report prepared for LandCorp, Dr A.S. Weston, St James Western Australia

## **Appendix 3**

**Summary of identification of relevant environmental factors**

## Summary of identification of relevant environmental factors.

Preliminary Environmental Factors and Factors raised in Submissions	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factors
<b>BIOPHYSICAL</b>			
Bushland values, flora and fauna	The proposal will result in the clearing of approximately 60 ha of native vegetation that provides habitat for native fauna.	Submissions generally sought the protection of the site's bushland, flora and fauna, particular species, South Lake values, Beeliar Regional Park values, biodiversity, the intrinsic values of bushland, and the visual amenity provided by the bushland. The Department for Planning and Infrastructure advised that the site had been previously considered for Bush Forever but was not required. Some submissions supported development on the site.	<p><b>Considered to be relevant to this assessment by the EPA.</b></p> <p>Addressed in this report under the factors of bushland values, fauna, protection of South Lake and wetland buffer, and protection of landscape values.</p>
Protection of South Lake and wetland buffer	<p>The site adjoins South Lake. South Lake is subject to the <i>Environmental Protection (Swan Coastal Plain Lakes) Policy 1992</i>, and in a Bush Forever site that forms part of the Beeliar Regional Park. The WRC Management Categories for the lake are Resource Enhancement and Multiple Use.</p> <p>The proposal may potentially impact on the water quality and water regime of South Lake, on the ecological systems supported by South Lake, and on fauna requiring both wetland and dryland habitat types.</p>	The submissions indicate that significant concern was held regarding the degraded nature of the buffer and the ability of efforts to rehabilitate areas of the buffer to the west and Beeliar Regional Park to the south of South Lake in a timely manner to provide habitat offsets for those lost through clearing and development. Many submissions stressed the value of upland vegetation for the maintenance of fauna habitat and ecological diversity around South Lake. A submission by the City of Cockburn referred to the City's Bushplan submission that sought protection of the buffer to the ridgeline some 200 metres from South Lake. Other submissions referred to the need for the protection of landscape values around South Lake, and the protection of water quality.	<p><b>Considered to be relevant to this assessment by the EPA.</b></p> <p>Addressed in this report under the factors of protection of South Lake and wetland buffer, drainage management, fauna, and protection of landscape values.</p>

<b>Preliminary Environmental Factors and Factors raised in Submissions</b>	<b>Proposal Characteristics</b>	<b>Government Agency and Public Comments</b>	<b>Identification of Relevant Environmental Factors</b>
<b>POLLUTION</b>			
Site Contamination	The current and historical use of the site for paper manufacturing operations has resulted in site contamination at some locations in Lot 502. This has occurred through the spray irrigation of effluent and paper pulp into storage areas, and the use of landfill and effluent storage ponds. In-situ material may cause unacceptable soil and/or groundwater contamination.	Several submissions indicated concern that the clean-up of a contaminated site should not be contingent upon a development proposal proceeding. This site should be cleaned up as soon as possible regardless of this proposal. The landfill material should be removed and the effluent ponds should be decommissioned, and any contamination should be cleaned up. It is of concern that the effluent disposal area considered to have low levels of contamination is being proposed as Public Open Space. Concern was expressed about the removal of trees that could be containing the liquid pollution, and about the potential spread of polluted soil through transportation to other sites. The issue of ownership of the public open space proposed over the waste disposal site and the potential health risk was raised by the City of Cockburn.	<b>Considered to be relevant to this assessment by the EPA.</b>  Addressed in this report under the factor of site contamination.
Drainage Management	Drainage of stormwater from the subdivision and subsequent industrial development has the potential to cause unacceptable impacts on Beeliar Regional Park, South Lake, and the fringing wetlands through surface and groundwater flows.	Submissions raised concerns about uncontrolled drainage and infiltration having the potential to cause unacceptable impacts on South Lake, the fringing vegetation and the Jandakot Mound through surface and groundwater flows. The Water and Rivers Commission sought that the proponent commit to and modify the proposal to incorporate total water cycle management concepts ie Water Sensitive Urban Design principles.	<b>Considered to be relevant to this assessment by the EPA.</b>  Addressed in this report under the factor of drainage management.
Noise	The proposal will generate noise from activities associated with the construction of the estate. It is anticipated there will be an increase in traffic noise associated with development and operation of estate. Subsequent industrial development on the site has the potential to cause noise outside the subdivision.	Submissions addressed the concern that noise during development, and the subsequent activities on the industrial site, will be intrusive and cause nuisance to surrounding land-uses. Light industry is notorious for pollution and difficult to police.	The proponent has committed to prepare and implement a Construction Management Plan incorporating the management of noise and traffic during construction. Subsequent industrial operations in the estate will be subject to noise regulations and other government approvals. Subsequent traffic management is

<b>Preliminary Environmental Factors and Factors raised in Submissions</b>	<b>Proposal Characteristics</b>	<b>Government Agency and Public Comments</b>	<b>Identification of Relevant Environmental Factors</b>
			<p>also subject to other government processes and is beyond the scope of the EPA and its assessment.</p> <p>Noise is not considered to be an environmental factor that requires assessment in this EPA report.</p>
<p>Air quality, dust and particulates</p>	<p>The proposal will generate dust from substantial earthworks and the clearing of vegetation that may potentially extend beyond the site boundaries.</p> <p>Removal of the vegetation and ridgeline may increase dust deposition to South Lake. Future uses have the potential to cause air quality problems.</p>	<p>Submissions argued that dust generated from existing cleared industrial areas adjacent to proposal area is a significant existing air quality problem. Proposal will exacerbate problem and potentially impact the health of children, teachers and staff at the Waldorf School. Additionally, health of residents of retirement village in Bibra Lake may be affected. Dust control will be a major issue for this development, particularly if not all lots are sold quickly. The massive earthworks proposed would create significant problems with dust and particulates for both residents and the environment. Light industry is notorious for pollution and difficult to police. Removing bushland buffer zones works against reductions in greenhouse gas emissions. There are health hazards associated with locating industrial areas adjacent to residential areas.</p>	<p>The proponent has committed to prepare and implement a Construction Management Plan to address dust management, waste disposal, transport, and reporting of, and response to, incidents involving environmental issues. The proponent has also committed to prepare and implement a Landscape Protection and Management Plan (LPMP) and to proceed with development in a staged manner. The LPMP will address land stabilisation to mitigate dust generation.</p> <p>Other approval processes will address the subsequent industrial development on the site. The management of greenhouse gas emissions requires a strategic approach, and is not appropriately addressed at the level of this proposal.</p>

Preliminary Environmental Factors and Factors raised in Submissions	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factors
			Therefore air quality, dust and particulates are not considered to be environmental factors relevant to this assessment by the EPA.
<b>SOCIAL SURROUNDINGS</b>			
Landscape protection and visual amenity	Industrial development on the site may intrude on the vegetated ridgeline west of South Lake which is of importance to local landscape values and visual amenity. The area contributes to landscape values of Beeliar Regional Park.	Submissions raised concerns regarding the potential for the industrial development to be visible particularly from Beeliar Regional Park and South Lake, when viewed from the east. Many submitters sought the retention of the native vegetation on the entire site. Some sought wider buffers, extending higher up the landscape with augmented screening. A greenbelt entry statement adjoining North Lake Road was raised by the City of Cockburn.	<p><b>Considered to be relevant to this assessment by the EPA.</b></p> <p>Addressed in this report under the factor of protection of landscape values.</p>
Aboriginal Heritage and Use	Lot 502 has a campsite with associated scatters and six scar trees registered with the Department of Indigenous Affairs. It is proposed that the camp site and four of the scar trees will be retained in-situ in public open space, and that two of the scar trees will be relocated to Regional Open Space. Native vegetation and fauna has cultural importance to Aboriginal people. The area is subject to Native Title Claims that are the subject of other legal processes.	The Swan Coastal Plains Native Title Claimants expressed their concern that as Native Title Holders and Sites Custodians they had not been consulted about their Native Title, Heritage Sites and Environmental concerns regarding the site. Submissions raised concerns about the disturbance of Aboriginal sites, and whether due process had been followed.	<p>LandCorp advises that it has spoken to the Swan Coastal Plains Native Title Claimants Group since their submission, and that the group were consulted during the Aboriginal Site Identification Survey by R.T. Parker and P. Greenfield (1999). The Department of Indigenous Affairs has since advised the proponent that it has gained section 18 approval under the <i>Aboriginal Heritage Act 1972</i>.</p> <p>The proponent has committed to prepare and implement a Construction Management Plan that will address the potential uncovering of archaeological material during construction.</p>

<b>Preliminary Environmental Factors and Factors raised in Submissions</b>	<b>Proposal Characteristics</b>	<b>Government Agency and Public Comments</b>	<b>Identification of Relevant Environmental Factors</b>
			<p>The proponent is required to act in accordance with heritage protection legislation. Therefore Aboriginal heritage and use are not considered to be environmental factors that require assessment in this EPA report.</p>
<p>Traffic and Safety</p>	<p>The proposal will generate an increase in truck movements associated with subdivisional works, increase in traffic volumes from operation of the estate and potentially an increase in risk to public safety from activities in industrial estate.</p>	<p>Submissions expressed concern that industrial development would mean an increase in heavy service vehicles and traffic congestion. A severe traffic problem would occur at the entry to the estate from North Lake Road. A submission considered that the proposal provides an opportunity to resolve a deficit regional road network. It is questionable that traffic on Phoenix Road will reduce as stated in the PER.</p>	<p>The proponent has committed to prepare and implement a Construction Management Plan incorporating the management of traffic. Traffic management subsequent to construction works and safety issues relating to the operation of the estate will be subject to other government processes, and are beyond the scope of the EPA and its assessment.</p> <p>Traffic and safety are not considered to be environmental factors that require assessment in this EPA report.</p>

## **Appendix 4**

### **Recommended Environmental Conditions and Proponent's Consolidated Commitments**



**RECOMMENDED CONDITIONS AND PROCEDURES**

**STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED  
(PURSUANT TO THE PROVISIONS OF THE  
ENVIRONMENTAL PROTECTION ACT 1986)**

**SUBDIVISION OF LOT 502 NORTH LAKE, SUDLOW AND  
PHOENIX ROADS, BIBRA LAKE, FOR INDUSTRIAL AND MIXED  
BUSINESS PURPOSES**

**Proposal:** The subdivision of Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake, City of Cockburn, for industrial and mixed business purposes, as documented in schedule 1 of this statement.

**Proponent:** Western Australian Land Authority trading as LandCorp

**Proponent Address:** Wesfarmers House Level 3, 40 The Esplanade, Perth WA 6000

**Assessment Number:** 1361

**Report of the Environmental Protection Authority:** Bulletin 1091

The proposal referred to above may be implemented subject to the following conditions and procedures:

*Procedural conditions*

**1 Implementation and Changes**

- 1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.
- 1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

- 1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

## **2 Proponent Commitments**

- 2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.
- 2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of fulfilment of the conditions in this statement.

## **3 Proponent Nomination and Contact Details**

- 3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under Section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment and Heritage has exercised the Minister's power under Section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.
- 3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.
- 3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

## **4 Commencement and Time Limit of Approval**

- 4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment and Heritage will determine any dispute as to whether the proposal has been substantially commenced.

- 4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment and Heritage, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

- the environmental factors of the proposal have not changed significantly;
- new, significant, environmental issues have not arisen; and
- all relevant government authorities have been consulted.

Note: The Minister for the Environment and Heritage may consider the grant of an extension of time limit of approval not exceeding five years for the substantial commencement of the proposal.

### *Environmental conditions*

## **5 Compliance Audit and Performance Review**

- 5-1 The proponent shall prepare an audit program in consultation with, and submit compliance reports to, the Department of Environmental Protection which address:

- the implementation of the proposal as defined in schedule 1 of this statement;
- evidence of compliance with the conditions and commitments in this statement; and
- the performance of the environmental management plans and programs.

Note: Under Sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposal is implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

- 5-2 Prior to the commencement of each of Stages 2 to 8 of the development as shown on figure 1 schedule 2, the proponent shall submit a performance review report to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority, which addresses:
- progress and success of the rehabilitation of the land the subject of the Rehabilitation and Bush Restoration Plan referred to in condition 6-1;
  - the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;
  - any significant improvements gained in environmental management; and
  - the proposed environmental targets for the next stage of development, specifically including improvements in rehabilitation and landscape revegetation of the site and buffer areas.
- 5-3 Prior to the clearing of native vegetation or conducting any ground-breaking activities associated with the development of Stages 7 and 8 (as shown on figure 2 schedule 2), the proponent shall demonstrate that the performance criteria detailed in the Rehabilitation and Bush Restoration Plan have been achieved, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

## **6 Rehabilitation and Bush Restoration**

- 6-1 Prior to the clearing of native vegetation or conducting any ground-breaking activities associated with the subdivision, the proponent shall prepare a Rehabilitation and Bush Restoration Plan for the rehabilitation area in Beeliar Regional Park to the south and for the 5 ha of “buffer” to the west of South Lake, as shown on figure 2 schedule 2, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Note: In the preparation of advice to the Minister for the Environment and Heritage, the Environmental Protection Authority expects to obtain the advice of the Department of Conservation and Land Management.

The objectives of the Rehabilitation and Bush Restoration Plan are:

- To enhance the viability and condition of floristic communities and fauna habitats within the 10 hectares of degraded area of Beeliar Regional Park to the south of South Lake and the 5 hectares of “buffer” to the west of South Lake as shown on figure 2 schedule 2;
- To rehabilitate 10 hectares of degraded area of Beeliar Regional Park to the south of South Lake as shown on figure 2 schedule 2; and
- To rehabilitate the 5 hectares of “buffer” to the west of South Lake as shown on figure 2 schedule 2;

This Plan shall address the following topics and for each topic develop appropriate performance criteria:

- 1 Seed collection based on local provenance;
  - 2 Species to be planted (diversity and numbers);
  - 3 The re-establishment of those species (location, timing, number, proportion and density);
  - 4 Weed control and the management of exotic flora;
  - 5 The re-establishment of fauna habitats (number, type and density);
  - 6 The use of topsoil and mulch stockpiles from the development sites as far as practicable in the rehabilitation areas;
  - 7 Environmentally sensitive public access to the rehabilitation areas;
  - 8 Predator control;
  - 9 Fire management;
  - 10 Planting and other rehabilitation regimes;
  - 11 Maturity of rehabilitated areas prior to commencement of Stage 7;
  - 12 Timing of rehabilitation actions with implementation to be concurrent with all stages of development;
  - 13 Monitoring and reporting of progress of the rehabilitation program, and its effectiveness; and
  - 14 the periodic review of the Rehabilitation and Bush Restoration Plan, and progress towards attainment of the performance criteria contained therein.
- 6-2 The proponent shall implement the Rehabilitation and Bush Restoration Plan required by condition 6-1 to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.
- 6-3 The proponent shall make the Rehabilitation and Bush Restoration Plan required by condition 6-1 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Note: In the preparation of advice to the Minister for the Environment and Heritage, the Environmental Protection Authority expects to obtain the advice of the Department of Conservation and Land Management.

## **7 Landscape Protection and Management**

- 7-1 Prior to the clearing of native vegetation or conducting any ground-breaking activities associated with the development of Stages 1 to 8 (as shown on figure 1 schedule 2), the proponent shall prepare a Landscape Protection and Management Plan to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The objectives of the Landscape Protection and Management Plan are:

- To reintroduce local flora species and habitat into Stages 1 to 8;
- To protect the landscape amenity of Beeliar Regional Park, and
- To stabilise the development lots.

This Plan shall address the following topics and for each topic develop appropriate performance criteria:

*Reintroduction of local flora and habitat*

- 1 Seed and plant collection based on local provenance;
- 2 Clearing, mulching and stockpiling of vegetative material removed during earthworks;
- 3 Removal and stockpiling of topsoil during earthworks;
- 4 Replacement of topsoil and mulch onto subdivided lots;

*Site stabilisation*

- 5 Use of environmentally sensitive soil stabilisation technologies, and exclusion of exotic seeded stabilisation techniques;
- 6 Utilisation of topsoil and mulch stockpiles as stabilisation materials as far as practicable;

*Landscape amenity*

- 7 Native garden landscaping outside of subdivided lots utilising only indigenous native species;
- 8 Planting for screening;
- 9 Provision of fauna habitats in native gardens outside of subdivided lots (log placement, niche creation);
- 10 Landscaping guidance for future occupiers of subdivided lots including the use of indigenous species;
- 11 Control of building heights and colours; and

*Monitoring and reporting*

- 12 Monitoring and reporting of progress of the landscaping program and its effectiveness.

7-2 The proponent shall implement the Landscape Protection and Management Plan required by condition 7-1 to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-3 The proponent shall make the Landscape Protection and Management Plan required by condition 7-1 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Note: In the preparation of advice to the Minister for the Environment and Heritage, the Environmental Protection Authority expects to obtain the advice of the Department of Conservation and Land Management and the City of Cockburn.

## **Procedures**

- 1 Where a condition states “to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority”, the Chief Executive Officer of the Department of Environmental Protection will obtain that advice for the preparation of written advice to the proponent.
- 2 The Environmental Protection Authority may seek advice from other agencies, as required, in order to provide its advice to the Chief Executive Officer of the Department of Environmental Protection.

## **Notes**

- 1 The Minister for the Environment and Heritage will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.

## Schedule 1

### **The Proposal (Assessment No. 1361)**

The proposal is for the subdivision of Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake, City of Cockburn, for industrial and mixed business purposes. The site is approximately 17 kilometres south of Perth, immediately to the west of South Lake.

The proposal consists of the clearing of areas of native vegetation, site works and the creation of approximately 171 industrial lots, associated roads and other infrastructure, drainage areas, and local and regional public open space, as shown indicatively in figure 1.

A buffer of not less than 150 metres and extending at least 214 metres from the high water mark (as shown in figure 2) of South Lake and comprising an area of at least 11.2 hectares is to be protected from development. In the south west corner of Lot 502, tuarts (*Eucalyptus gomphocephala*) and four scarred trees of Aboriginal significance will be retained in public open space at least 1 hectare in area.

The above-mentioned buffer to South Lake will be ceded to the Crown for the purposes of incorporation into Beeliar Regional Park.

The proponent will rehabilitate 15 hectares of degraded areas to the south and west of South Lake as shown in figure 2.

The site will be developed in stages (1 to 8) consecutively to allow rehabilitation to mature progressively and fauna opportunity to move from areas being disturbed into areas that have been rehabilitated or into areas of remnant vegetation. The proposed staging of the development is shown in figure 1.

The key proposal characteristics are shown in table 1.

### **Figures (attached)**

Figure 1 – Lot 502 - staged subdivision plan and buffer; and

Figure 2 – Rehabilitation areas;



Table 1 Key proposal characteristics

Characteristic	Description
Location	Lot 502 North Lake Road, Phoenix Road, and Sudlow Road, Bibra Lake, City of Cockburn
<b>Industrial subdivision</b>	
Total Area of Lot 502	Approximately 89 ha
Number of lots	Approximately 170
Public open space (additional to South Lake buffer)	Approximately 4.5 ha
Associated infrastructure	Roads as shown indicatively on figure 1
	Native vegetation gardens at North Lake Road entrance and along road verges and median strips where practicable.
	Power
	Water
	Gas
	Communications
	Drainage
Vegetation disturbance	Approximately 60 ha of mostly Jarrah-Banksia woodland in degraded to very good condition
<b>South Lake buffer strip</b>	
Regional Open Space	As shown indicatively on figure 2 and at least 11.2 ha in area
<b>Rehabilitation programs</b>	
Rehabilitation of buffer	5 ha on Lot 502 to be rehabilitated within South Lake buffer strip as shown indicatively on figure 2.
Rehabilitation program around South Lake	Area of approximately 10 ha to be rehabilitated within Beeliar Regional Park adjacent to the southern edge of South Lake as shown on figure 2.
<b>South west corner of Lot 502</b>	
Public Open Space	As shown indicatively on figure 1 and at least 1 ha in area to retain tuarts and four Aboriginal scar trees

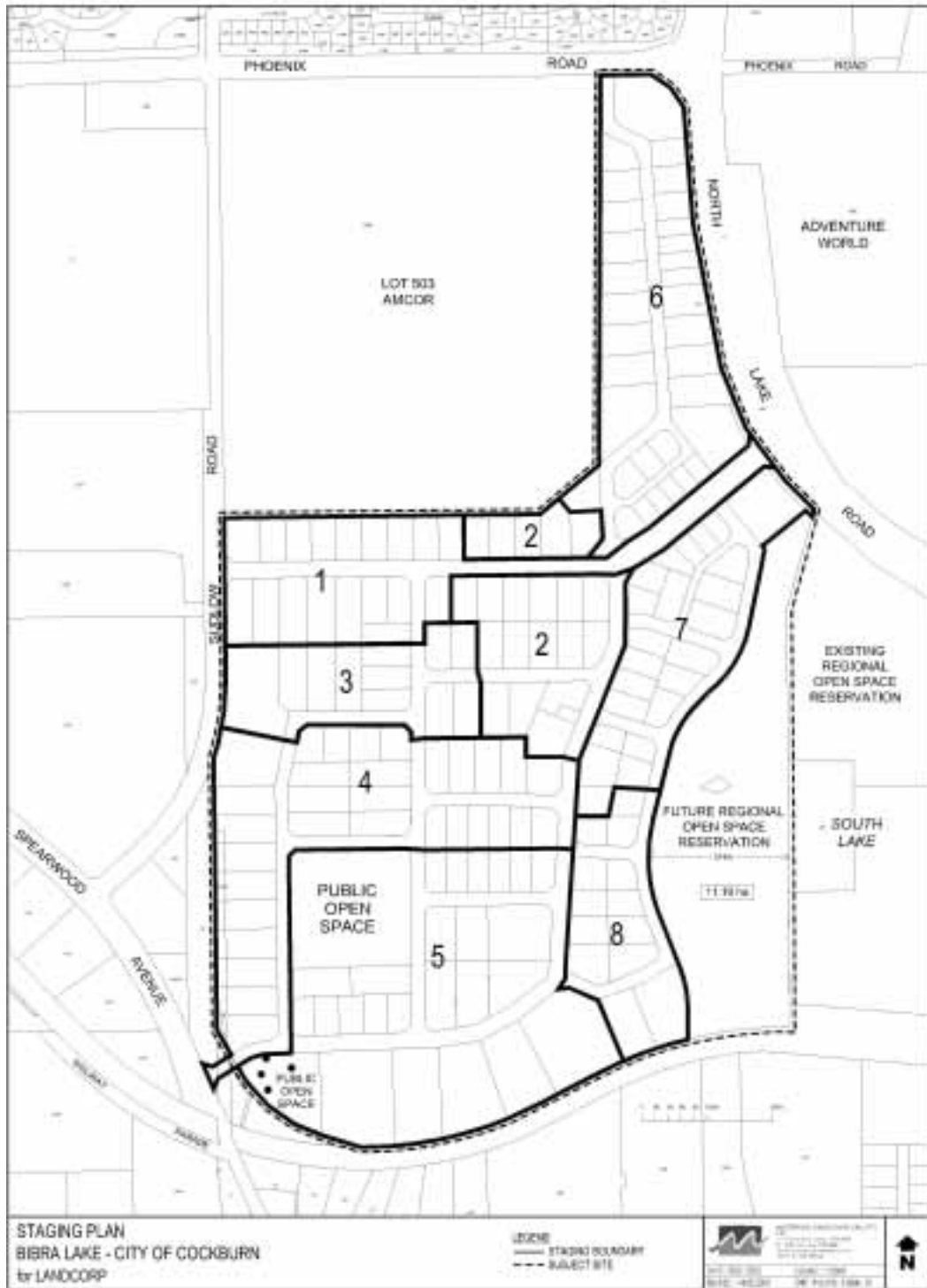


Figure 1: Lot 502 - Staged subdivision plan and buffer



Figure 2 Rehabilitation areas

Schedule 2

## **Environmental Management Commitments**

February 2003

Industrial Subdivision – Lot 502 North Lake,  
Sudlow and Phoenix Roads, Bibra Lake  
City of Cockburn

(Assessment No.1361)

**Western Australian Land Authority trading as LandCorp**

**Table 1 Environmental Management Commitments - Industrial subdivision of Lot 502 North Lake, Sudlow and Phoenix Roads, Bibra Lake Assessment No. 1361**

No	Topic	Objective(s)	Action	Timing	Advice
1	Wetland buffer	To protect South Lake from the potential impacts of development.	Cede land along the western edge of South Lake to the conservation estate generally as shown in figure 2 for the purposes of maintaining the separation distance between the development and South Lake. The land ceded will be at least 11.2 hectares in area and be no less in width at any point than is shown in figure 2.	Before the commencement of the project	CALM
2	Drainage Management Plan	To protect water quality of South Lake.	Prepare a Drainage Management Plan, in accordance with: <ul style="list-style-type: none"> <li>• Water Sensitive Urban Design principles; and</li> <li>• Stormwater management guidance as pertaining to EPA Draft Guidance No. 26 Management of Surface Run-off from Industrial and Commercial Sites (EPA 1999).</li> </ul>	Before first stage of clearing and construction	WRC, City of Cockburn, CALM
3	Drainage Management Plan	To protect water quality of South Lake.	Implement the Drainage Management Plan referred to in commitment 2.	During construction	WRC, City of Cockburn
4	Aboriginal heritage	To protect Aboriginal sites.	Retain an area of woodland in the south west corner of Lot 502 for use as Public Open Space as shown on figure 1 to incorporate four 'scar trees' of Aboriginal heritage significance.	Before first stage of construction	Department of Indigenous Affairs

No	Topic	Objective(s)	Action	Timing	Advice
5	Construction Management Plan	To protect bushland and wetlands in adjacent conservation areas, Aboriginal sites, and the amenity of nearby residents during the subdivision construction phases.	Prepare a Construction Management Plan to address: <ul style="list-style-type: none"> <li>• Prevention of disturbance of vegetation in the buffer to South Lake, the adjoining Bush Forever site and the woodland in the Public Open Space in the south west corner of the subdivision;</li> <li>• Dieback and weed hygiene/control;</li> <li>• Prevention and response to chemical and fuel spills;</li> <li>• Waste disposal;</li> <li>• Dust;</li> <li>• Noise;</li> <li>• Transport;</li> <li>• Uncovering of Aboriginal Sites; and</li> <li>• Reporting of, and response to, incidents involving environmental issues.</li> </ul>	Before first stage of clearing and construction	WRC, City of Cockburn, CALM
6	Construction Management Plan	To protect bushland and wetlands in adjacent conservation areas, Aboriginal sites, and the amenity of nearby residents during the subdivision construction phases.	Implement the Construction Management Plan referred to in commitment 5.	During construction	WRC, City of Cockburn, CALM
7	Soil and Groundwater Contamination Management Plan	To ensure that remediation achieves an acceptable standard consistent with: <ul style="list-style-type: none"> <li>• the intended land use and the protection of the environment; and</li> <li>• criteria recognised by the Department of Environmental Protection.</li> </ul>	Prepare a Soil and Groundwater Contamination Management Plan consistent with the requirements of the Department of Environmental Protection Contaminated Sites Management Series to include: <ul style="list-style-type: none"> <li>• Further site investigation or validation of data, as appropriate;</li> <li>• Procedures for remediation; and</li> <li>• Post-remedial validation.</li> </ul>	Before first stage of clearing and construction	Land and Water Quality Branch DEP

No	Topic	Objective(s)	Action	Timing	Advice
8	Soil and Groundwater Contamination Management Plan	As above.	Implement the Soil and Groundwater Contamination Management Plan referred to in commitment 7.	During construction	Land and Water Quality Branch DEP
9	Fauna relocation	To reduce impact on local mammal species.	Relocate Quenda ( <i>Isoodon obesulus</i> ) and Brush-tailed Possum ( <i>Trichosurus vulpecula</i> ) in accordance with CALM requirements.	Before each stage of clearing and construction	CALM
10	Fauna movement	To reduce impact on local fauna species.	Progressively clear and construct each stage of the subdivision, as per figure 1, with each stage commencing at least 6 months after the commencement of the previous stage.  NB: A condition applies to Stages 7 and 8.	Progressively during construction	

**Abbreviations:**

CALM: Department of Conservation and Land Management

WRC: Water and Rivers Commission

DEP: Department of Environmental Protection

# **Appendix 5**

**Summary of Submissions and  
Proponent's Response to Submissions (see attached CD)**



## Submissions

### No. of submissions

Non-government organisations	17
Individuals - proforma with additional comment	116
Individuals - proforma (no additional comment)	196
Individuals - non-proforma	25
Government organisations	6
Total	Approx. 360

### Type of submission

In support	5
Not in support	Approx. 348
Advice submitted on proposal	7

**NOTE:** After the public review period, further telephone comments from members of the public and a deputation from non-government organisations were received and considered by the EPA Service Unit.

The issues raised, and the proponent's response to the submissions is in the attached CD.