PUBLIC ENVIRONMENTAL REVIEW

Armstrong Reserve, Dunsborough
Aged Care Facility Development
EPA ASSESSMENT No. 1808

Prepared for:

RAY VILLAGE AGED SERVICES (INC.) t/a CAPECARE
20 Ray Avenue
BUSSELTON WA 6280

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Prepared by:
ENDPLAN Environmental
[ABN: 57 191 364 697]

PO Box 138
NORTH FREMANTLE WA 6159
P: (08) 9336 6464 / M: 0447 366 460
E: bernadette@endplanep.com

In Association with:
PGV Environmental
[ABN: 44 981 725 498]

Unit 210/396 Scarborough Beach Road
Osborne Park WA 6017
P: (08) 9202 8780 / M: 0427 005 226
E: paul@pgv.net.au

INVITATION TO MAKE A SUBMISSION

The Environmental Protection Authority (EPA) invites people to make a submission on this proposal. Both electronic and hard copy submissions are most welcome.

Ray Village Aged Services (Inc) trading as Capecare is proposing to develop a 1.28 ha portion of Armstrong Reserve, Naturaliste Terrace, Dunsborough in order to construct an aged care facility. The proposal will require clearing 9020m^2 of native vegetation. The proposed aged care facility will consist of an adult day care centre, independent and supported living accommodation units, administration offices and community facilities including meeting rooms for the CWA. In accordance with the *Environmental Protection Act 1986* (EP Act), a Public Environmental Review (PER) has been prepared which describes this proposal and its likely effects on the environment. The PER is available for a public review period of **6** weeks from **17 September 2012** closing on **29 October 2012**.

The proposed action has also been referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is being assessed under the bilateral agreement with Western Australia.

Comments from government agencies and from the public will help the EPA to prepare an assessment report in which it will make recommendations to government.

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action - including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received by the EPA will be acknowledged. Submissions will be treated as public documents unless provided and received in confidence, subject to the requirements of the *Freedom of Information Act 1902* (FOI Act), and may be quoted in full or in part in the EPA's report.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining with a group interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increase the pool of ideas and information. If you form a small group (up to 10 people) please indicate all the names of the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with, or comment on, the general issues discussed in the PER or the specific proposals. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal more environmentally acceptable.

When making comments on specific elements of the PER:

- clearly state your point of view;
- indicate the source of your information or argument if this is applicable;
- suggest recommendations, safeguards or alternatives.

Points to keep in mind

By keeping the following points in mind, you will make it easier for your submission to be analysed:

- attempt to list points so that the issues raised are clear. A summary of your submission is helpful;
- refer each point to the appropriate section, chapter or recommendation in the PER;
- if you discuss different sections of the PER, keep them distinct and separate, so there is no confusion as to which section you are considering;
- attach any factual information you wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- your name;
- your address;
- date; and
- whether and the reasons why you want your submission to be confidential.

Information in submissions will be deemed public information unless a request for confidentiality of the submissions is made in writing and accepted by the EPA. As a result, a copy of each submission will be provided to the proponent but the identity of private individuals will remain confidential to the EPA.

The closing date for submissions is:

29 October 2012

The EPA prefers submissions on PER documents to be made electronically using one of the following:

- by email to submissions@epa.wa.gov.au;
- by email to the officer amy.sgherza@epa.wa.gov.

Alternatively, submissions can be

- posted to: Chairman, Environmental Protection Authority, Locked Bag 33, CLOISTERS SQUARE, WA 6850, Attention: Amy Sgherza; or
- Environmental Protection Authority, Level 4, The Atrium, 168 St Georges Terrace, Perth, Attention: Amy Sgherza; or
- If you have any questions on how to make a submission, please ring the EPA assessment officer, Amy Sgherza on (08) 6467 5424

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EXECUTIVE SUMMARY

Ray Village Aged Services (Inc.) t/a Capecare, proposes to develop a 1.28 ha portion of Armstrong Reserve, Naturaliste Terrace, Dunsborough (the site), for the purpose of an aged care facility (**Figure 1**).

The Environmental Protection Authority (EPA) has determined that a Public Environmental Review (PER) is required to assess the environmental impact of the proposed development.

Location

The site is located approximately 500 m north of the business centre of the town of Dunsborough and is bounded by Armstrong Place, Gifford Road and Naturaliste Terrace.

Ownership and Land Use Zoning

The site covering an area of approximately 4.22 ha is situated in the Dunsborough Townsite within the municipal boundary of the City of Busselton and comprises a number of lots that are currently vested in either the State of Western Australia, the City (Shire) of Busselton or the Country Women's Association of Western Australia (CWA). The lots are zoned either 'Recreation' or 'Drainage' under the City of Busselton's Town Planning Scheme No. 20 (**Figure 2**).

Assessment Process

In May 2006, the Proponent referred the development proposal to the then Commonwealth Department of the Environment and Heritage (now known as the Department of Sustainability, Environment, Water, Population and Communities – DSEWPaC) for a decision as to whether or not approval would be needed under Chapter 4 of the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act 1999). On the 28 June 2006, the Proponent was advised that the proposed action to develop aged care facilities on Naturaliste Terrace, Dunsborough, Western Australia (EPBC 2006/2834) was deemed to be a controlled action under the Act.

The Part 3, Division 1, controlling provisions are:

- Sections 18 and 18A (Listed threatened species and communities).

In 2006, the Environmental Protection Authority (EPA) received a third party referral regarding the proposal by the Proponent to develop the site for the purposes of an aged care facility. On the 17 December 2008 the EPA notified the Proponent of its intention to set the level of assessment as a 'Proposal Unlikely to be Environmentally Acceptable (PUEA)' due to the presence of *Pseudocheirus occidentalis* (Western Ringtail Possum) and the regional significance of the vegetation and issued their Statement of Reasons for Level of Assessment (LoA). Following the Proponent's successful appeal to the Office of the Appeals Convenor on that decision (Appeal No. 001/09), the Minister for the Environment remitted the proposal to the EPA under Section 43 of the *Environmental Protection Act 1986* (EP Act) on 27 August 2009, for the proposal to be assessed more fully and more publicly.

In making this determination, the Minister provided the Proponent with the opportunity to:

(i) Establish the environmental significance of the vegetation on Armstrong Reserve and demonstrate whether the proposal can be managed in an environmentally acceptable manner to protect these flora values;

(ii) Determine the environmental significance of Armstrong Reserve as habitat for the Western Ringtail Possum and demonstrate whether the proposal could be managed in an environmentally acceptable manner to protect the local populations of this species; and
(iii) Demonstrate that the proposal can be developed to be consistent with EPA policy, specifically Position Statement No. 2 *Environmental Protection of Native Vegetation in Western Australia*; and Position Statement No. 9 *Environmental Offsets*; and

Under Section 38 of the EP Act, the EPA assigned the proposal a Public Environmental Review (PER) level of assessment with a 6 week public review period. The EPA's decision to assess the proposal was advertised in *The West Australian* newspaper on 21 September 2009 (EPA Assessment No. 1808).

The Commonwealth and Western Australian governments have signed a bilateral agreement under s.45 of the EPBC Act to provide for accreditation of certain State environmental assessment processes. As the environmental assessment for the site will be undertaken under the bilateral agreement, the action will not require separate assessment under Part 8 of the EPBC Act.

Summary Description of the Proposal

The key characteristics of the proposal are identified in **Table 1**.

TABLE 1
PROJECT KEY CHARACTERISTICS

PROPOSAL TITLE	Aged Care Facility Development, Armstrong Reserve, Dunsborough
PROPONENT NAME	Ray Village Aged Services (Inc.) t/a Capecare
SHORT DESCRIPTION	The proposal is to develop a 1.28 ha portion of the site for the purpose of constructing an aged care facility.
PHYSICAL ELEMENTS	The proposed development footprint comprises 1.28 ha of the site as identified on **Figure 2** consisting of Lots 111, 115, 116, 117 and an 9994 m^2 portion of Lot 257.
OPERATIONAL ELEMENTS	The facility will consist of: - Adult day care centre - A number of independent and supported living accommodation units (buildings will be 2-3 storeys in height) - Administration offices and community facilities (including meeting rooms for the CWA) - Internal road network - Two-way road access between the proposed development footprint and Naturaliste Terrace and Gifford Road Identified on **Figure 6**.
SIGNIFICANT VEGETATION	The proposed development footprint will require the removal of 9020 m^2 of Western Ringtail Possum habitat including 174 Native Peppermint (*Agonis flexuosa*) trees. This area also comprises 4352 m^2 of a nominated Priority 1 Ecological Community (PEC) identified on **Figures 8, 9 and 11**.

Stakeholder Consultation

Since 2004, the Proponent has undertaken ongoing community consultation including meetings and workshops regarding the proposal. Consultation has focused upon issues relating to the need for aged care facilities being provided for the Dunsborough community, assessing alternative sites

in and around Dunsborough for the facility to be constructed upon and revising the extent of a development footprint in order to reduce environmental impacts on the local Western Ringtail Possum population and nominated Priority Ecological Community (PEC).

The Proponent's consultation program has included engaging with the following stakeholders:

Government Agencies
- Environmental Protection Authority
- Office of the Environmental Protection Authority
- Department of Environment and Conservation
- Fire and Emergency Services Authority
- Department of Sustainability, Environment, Water, Population and Communities
- Department of Water

Local Government
- City of Busselton

Local Community
- Local environmental groups
- CWA
- Dunsborough residents
- Local members of Parliament

The consultation programme has resulted in the City affirming their commitment to relocate the Shire Depot, and the CWA agreeing to be co-located within the proposed Day Care Centre in a purpose built portion of the building, to be for the exclusive use of the CWA.

The Proponent's initial concept plan for the proposed aged care facility was presented in the EPBC referral (2006/2834) identifying the proposed development footprint as encompassing the whole of the site (**Figure 5a**). In 2010, following extensive consultation with the Department of Environment and Conservation's (DEC) Blackwood District Office regarding the potential environmental impacts of the proposed development, the scale of the revised concept plan was reduced to cover approximately 50% of the site thereby avoiding what was then thought by the DEC to be a Threatened Ecological Community (TEC) and also to reduce the impact on the Western Ringtail Possum habitat (**Figure 5b**).

Following further consultation and comments received from key agencies through the development of the Environmental Scoping Document, the Proponent has identified a proposed development footprint that incorporates Lots 111, 115, 116, 117 and an 9994 m^2 portion of Lot 257 (**Figure 6**). The proposed development footprint as presented in this PER comprises approximately 1.28 ha or 30% of the overall site.

Information pertaining to the issues that have been raised during the community consultation undertaken to date (correspondence, notes taken at community meetings, and a list of newspaper articles relating to the proposal) are included in **Appendix 1**.

Identification of Environmental Impacts

The relevant environmental factors identified by the EPA for the site and a summary of the issues that may potentially result from the proposed development include:

- **Flora and Vegetation** – While 4332 m^2 of the proposed development footprint has historically been cleared, a further 9020 m^2 of native vegetation will be required to be cleared to enable construction of the proposed development.
- **Nominated Priority Ecological Community** – The proposed clearing will impact upon 4352 m^2 of a nominated Priority 1 Ecological Community (PEC).
- **Specially Protected (Threatened) Fauna** – Specially Protected (Threatened) Fauna, notably the Western Ringtail Possum, may be adversely affected by the proposed development footprint due to the potential clearing of 9020 m^2 of the species habitat.
- **Soil Quality** - Contamination associated with the former use of Lots 111 and 117 as a Shire works depot by the City of Busselton may be present within the proposed development footprint.

Site investigations that have been undertaken for each relevant factor include:

- **Vegetation and Flora** – Level 2 vegetation and flora surveys undertaken in Spring 2005, 2006 and 2007 (Coffey Environments, 2008) and 2009 (Ecoscape (Australia) Pty Ltd., 2010) (refer to **Appendix 3**).
- **Bush Fire Management** – A Fire Management Plan (FMP) has been prepared by FirePlan WA (2012) in consultation with, and to the satisfaction of the Fire and Emergency Services Authority (FESA), City of Busselton and the DEC (refer to **Appendix 7**).
- **Fauna** – Level 1 fauna survey (ATA Environmental, 2006) (refer to **Appendix 4**) and a Level 2 fauna survey (Ecoscape (Australia) Pty Ltd., 2012) (refer to **Appendix 5**).
- **Specially Protected (Threatened) Fauna** – An extensive targeted survey to determine areas of presence of Western Ringtail Possum within the site and an approximately 500 m circumference of the site was undertaken in 2007 (ATA Environmental, 2007). A targeted Western Ringtail Possum *s*urvey using Distance Sampling to estimate the size of the Western Ringtail Possum population conducted within the site in 2011 (Ecoscape (Australia) Pty Ltd., 2012) (refer to **Appendix 6**).
- **Soil Quality** – A Preliminary Site Investigation (PSI) (non-intrusive) undertaken in 2011 (Coffey Environments, 2012).

The site is approximately 4.2 ha in size, with 3.73 ha of the site comprising remnant vegetation. The proposed development footprint identified in this PER (**Figure 6**) comprises approximately 1.28 ha and has been sited to reduce the amount of native vegetation to be cleared to 9020 m^2. This vegetation comprises a combination of Western Ringtail Possum habitat (174 mature Native Peppermint (*Agonis flexuosa*) trees scattered amongst 9020 m^2 understorey vegetation), and 4352 m^2 of a nominated Priority 1 Ecological Community. The area of Western Ringtail Possum habitat that will remain on-site following development is 2.83 ha, while the area of nominated PEC that will remain on-site will be 2.78 ha.

At the vegetation complex level the proposed clearing of 9020 m^2 represents a very small percentage (0.01%) reduction in the amount of Abba Vegetation Complex remaining within the South West region but will slightly increase the amount of this vegetation complex in a reserve managed for its conservation values.

Key Management Actions

During the preparation of the ESD and site surveys undertaken, measures to be implemented to eliminate, reduce and/or manage the relevant environmental factors were identified.

The Proponent proposes that the vegetation clearing be offset by the provision of an 'environmental offsets package' negotiated with the Office of the Environmental Protection Authority (OEPA), the DEC and the City of Busselton and considered within the context of the Bilateral Agreement and the EPA's Guidance Statement 19 *Environmental Offsets - Biodiversity* (2008a) (refer to **Section 8**).

The Bushfire Hazard Assessment has identified the site as having "Extreme" bushfire hazard level. A Fire Management Plan has been prepared for the site in consultation with and to the satisfaction of the City of Busselton, FESA and the DEC (Fireplan WA, 2012). The maps associated with the proposal and the associated Fire Management Plan clearly indicate the requirements for fuel reduction zones and Building Protection Zones will be introduced within the proposed development footprint to create a 21 m setback from remnant vegetation to the buildings. All buildings will be constructed to AS 3959-2009 Bush Fire Attack (BAL) 29 standards to ensure the safety of occupants.

The following management plans are proposed to be prepared and implemented on-site by the Proponent as part of the proposed development's environmental approvals:

- Environmental (Vegetation and Fauna) Management Plan
- Drainage Management Plan
- Dieback Management Plan

Should the proposed detailed site investigation prove that areas of environmental concern identified during the preliminary site investigation are contaminated, or that acid sulfate soils are likely to be disturbed during the construction phase, then the following managements will also be prepared and implemented in consultation with the DEC:

- Acid Sulfate Soils Investigation and Management Plan
- Remediation and Validation Management Plan

In addition, the following management is proposed to be prepared and implemented at the offset site (Reserve 31645 Caves Road Dunsborough):

- Revegetation and Rehabilitation Plan

The approach outlined in the Western Australian Planning Commission's publication *Better Urban Water Management* is not intended to apply in brownfield or infill circumstances or to small scale subdivision or development proposals unless significant water management issues are present (Western Australian Planning Commission, 2008). Instead, development will be consistent with the principles of *State Planning Policy 2.9 Water Resources* (Western Australian Planning Commission, 2006) and the *Stormwater Management Manual for WA,* including the decision process which forms part of the manual (Department of Water, 2004-2007). Drainage concepts for surface and groundwater management will use best management practices as identified in the proposed Drainage Management Plan.

The potential environmental impacts, proposed management measures and the predicted environmental outcome for each of the environmental factors that have been assessed in the PER are summarised in **Table 2**.

Conclusion

In August 2009, the Minister for the Environment provided the Proponent with the opportunity to:

(i) Establish the environmental significance of the vegetation on Armstrong Reserve and demonstrate whether the proposal can be managed in an environmentally acceptable manner to protect these flora values;
(ii) Determine the environmental significance of Armstrong Reserve as habitat for the Western Ringtail Possum and demonstrate whether the proposal could be managed in an environmentally acceptable manner to protect the local populations of this species;
(iii) Demonstrate that the proposal can be developed to be consistent with EPA policy, specifically Position Statement No. 2 *Environmental Protection of Native Vegetation in Western Australia*; and Position Statement No. 9 *Environmental Offsets*; and
(iv) Address the EPA's concern about the long-term viability of the remaining bushland on Armstrong Reserve.

Level 2 fauna, flora and vegetation surveys undertaken on-site were conducted in accordance with key EPA guidance statements. Data obtained during the surveys have been used to establish the environmental significance of the site in terms of vegetation and Western Ringtail Possum habitat with a view to establishing environmental acceptable mitigation measures to ensure the long-term viability of the remaining bushland located outside of the proposed development footprint.

In order to mitigate residual impacts on key environmental assets (Western Ringtail Possum habitat and a nominated PEC) that are likely to result from the proposal to develop a 1.28 ha portion of the site containing 9020m^2 remnant vegetation, the Proponent is committed to providing appropriate offsets which aim to achieve a no net loss to Western Ringtail Possum habitat and that will increase the ecosystem health condition of the site enabling long-term environmental benefits to be afforded to the site.

The environmental offsets strategy proposed includes:

A. Rehabilitating 1.8 ha an off-site location (City of Busselton Reserve 31645 Caves Road Dunsborough).
B. Preparing and implementing a Revegetation and Rehabilitation Management Plan for the offset site.
C. Assessment of the immediate and long-term effects of development on the Western Ringtail Possum through implementation of a Western Ringtail Possum monitoring program on-site.
D. Preparing and implementing an Environmental (Vegetation and Fauna) Management Plan for the site.
E. Implementing a Fire Management Plan that has been prepared in consultation with and to the satisfaction of the City of Busselton, FESA and the DEC.
F. Preparing and implementing a Drainage Management Plan to the satisfaction of the City of Busselton that is designed to avoid any changes to the natural hydrology of the vegetation that is to be retained on-site.
G. Preparing and implementing a Dieback Management Plan to prevent further spread of *Phytophthora cinnamomi* within the site.
H. Preparing and implementing a Remediation and Validation Management Plan for the proposed development footprint.

With respect to the long-term management options available for the remaining 70% of the site located outside of the proposed development footprint, the City has advised that it would be willing to retain the vesting of the remainder of the site and manage it as Conservation POS (P. Malavisi pers. comm.). The planning process that will be entered into, should State and Commonwealth environmental approvals be granted, will involve the rezoning followed by subdivision/amalgamation of the affected lots. With respect to the area of Lot 257 that is located outside of the proposed development footprint, the City has advised that it will recommend to the Department of Lands that the legal use be changed from 'Recreation' to 'Landscape Protection' (P. Malavisi pers. comm.). Furthermore, the City has advised that it has no objection to the amalgamation of the lots south of Lot 258 and that this process will also be dealt with by the Department of Lands. The proposed development footprint will continue to be identified on the Scheme map as 'Recreation' until such time that the City has an omnibus amendment which will then likely change the identification in the Scheme to 'Special Purpose Zone – Aged Persons' (P. Malavisi, pers. comm.)

Based on the management measures and environmental offsets strategy that are proposed to be implemented by the Proponent, the City of Busselton's long-term management plan for the remainder of the site located outside of the proposed development footprint, it is concluded that the proposal to develop 1.28 ha of Armstrong Reserve can be managed in an environmentally acceptable manner to meet the EPA's and DSEWPaC's environmental objectives and guidelines for Flora and Vegetation, Specially Protected (Threatened) Fauna and Soil Quality.

TABLE 2
SUMMARY OF KEY POTENTIAL IMPACTS, PROPOSED MANAGEMENT MEASURES AND PREDICTED ENVIRONMENTAL OUTCOMES

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
Flora and Vegetation	Site (~4.02 ha)	To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (Environmental Protection Authority, 2044).	Clearing 9020 m^2 of native vegetation and retention of 2.83 ha. The proposed retention represents 77% of the 3.67 ha of native vegetation that occurs on the site. The vegetation to be cleared includes 4352 m^2 of the nominated PEC. The area of nominated PEC to be cleared represents 13%of the total area of nominated PEC (approximately 3.21 ha) on the site which means that 87% of the PEC on the site will be retained. Clearing 9020 m^2 (0.01%) of the 3198 ha of the remaining Abba Vegetation Complex. Alter the hydrology of an existing drainage channel occurring in the dampland vegetation the area of vegetation to be retained, adversely impacting on the nominated PEC. Increase the number of weeds establishing in the retained native vegetation. The Conservation POS may be impacted by the 'edge effect' (e.g. invasion of natural vegetation by weeds due to disturbance and improving access to pest animals such as foxes and feral cats that tend to move and harbour along roads and tracks). Introduce dieback disease into the site.	An Environmental (Vegetation and Fauna) Management Plan (EMP) will be prepared in consultation with and to the satisfaction of the DEC, DSEWPaC and the City of Busselton. The Proponent will be responsible for the implementation of the approved EMP for a period of three (3) years following which the City of Busselton will assume responsibility for implementation. The principal objectives of the EMP will be to: • Protect the conservation values within the area to be set aside as Conservation POS. • Conserve and enhance the natural habitat of the Western Ringtail Possum wherever practicable outside of the building footprint associated with the development area. The EMP will include but not be limited to: • Identification and protection of Western Ringtail Possum habitat and significant trees that are identified following detailed engineering/architectural design phase can be retained within the proposed development footprint; • Identification and protection of Black Cockatoo and Western Ringtail Possum habitat and significant trees that are to be retained outside of the proposed development footprint; • Clearing protocols to protect Black Cockatoo and Western Ringtail Possums both prior to and during clearing and construction activities; • A Western Ringtail Possum monitoring program to assess: - Derive a quantitative estimate of the population size within the site; and - Assess the immediate and long-term effects from the proposed development on the population within the site • Weed eradication program; • Detailed planting/landscaping plan for the proposed development footprint; • Revegetating degraded areas within the site with appropriate indigenous flora; • Soil and plant source material hygiene; • Controlling pedestrian and vehicle access to the site; • Water conservation principles; • Education program including signage, pamphlets and	Approximately 9020 m^2 of native vegetation will be cleared for the proposed development including 4352 m^2 of the nominated Priority 1 Ecological Community "*Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area". Approximately 87% of the nominated PEC will be retained on the site and will be managed for conservation by the City of Busselton in accordance with a comprehensive Environmental (Vegetation and Fauna) Management Plan. This is an improvement on the current unmanaged situation for the vegetation on the site. At the vegetation complex level the proposed clearing of 9020 m^2 represents a very small percentage (0.01%) reduction in the amount of Abba Vegetation Complex remaining but will slightly increase the amount of this vegetation complex in a reserve managed for its conservation values. The EPA's environmental objective for Flora and Vegetation will be achieved through restricting clearing to within the proposed footprint development and managing potentially adverse construction impacts through the implementation of a comprehensive EMP.

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
				other means, to engage the residential community about the function of the Western Ringtail Possum and its habitat requirements; • Responsibilities for implementation; • Monitoring criteria to determine the success of the revegetation and weed eradication program; • Progress and compliance reporting; and • Timing and implementation schedule that specific management measures will occur on-site. A Fire Management Plan (FMP) has been prepared in consultation with and to the satisfaction of the Fire and Emergency Services Authority (FESA), City of Busselton and the DEC. The principal objectives of the FMP are to: • Manage the potential impacts of a bush fire on the proposed development. • To reduce the threat to residents in the event of a fire within or near the proposed development by providing a hazard separation zone between remnant bushland and the proposed development. The bushfire protection requirements, as per the *Planning for Bushfire Protection Guidelines* (Western Australian Planning Commission and the Fire and Emergency Services Authority, 2010) will be contained within the proposed development footprint and not encroach upon the proposed Conservation POS. The FMP incorporates fire management methods such as: • Strategic firebreak system • Dwelling construction and setbacks • Building protection zone • Hazard separation zone • Hazard reduction • Provision of adequate water for fire fighting purposes • Progress and compliance reporting • Timing and implementation schedule. A Drainage Management Plan will be prepared and implemented on-site to protect the area of vegetation to be retained from any adverse changes in hydrology. To prevent further spread of *Phytophthora cinnamomi* dieback in Armstrong Reserve, a Dieback Management Plan will be prepared and implemented to the specifications of the DEC Guidelines (Department of Conservation and Land Management, 2004).	
Specially Protected	Site (~4.02 ha)	To maintain the abundance,	Western Ringtail Possum and potential Black	An Environmental (Vegetation and Fauna) Management	Approximately 9020 m^2 of Western Ringtail

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
(Threatened) Fauna		diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (Environmental Protection Authority, 2004).	Cockatoo habitat loss and fragmentation through clearing of 9020 m^2 of native vegetation to create the proposed development footprint. Loss of canopy connectivity used by individual Western Ringtail Possum at the local level to access habitat patches, and loss of habitat corridors, which allow populations to remain connected to the landscape. Fragmentation of habitat linkages may cause Western Ringtail Possum individuals to descend to the ground more frequently thereby increasing their risk from ground predators. Physical injury or fatality to fauna may occur during the vegetation clearing process and construction activities.	Plan (EMP) will be prepared in consultation with and to the satisfaction of the DEC, DSEWPaC and the City of Busselton. The Proponent will be responsible for the implementation of the approved EMP for a period of three (3) years following which the City of Busselton will assume responsibility for implementation. The principal objectives of the EMP will be to: • Protect the conservation values within the area to be set aside as Conservation POS. • Conserve and enhance the natural habitat of the Western Ringtail Possum wherever practicable outside of the building footprint associated with the proposed development area. The EMP will include but not be limited to: • Identification and protection of Western Ringtail Possum habitat and significant trees that are identified following detailed engineering/architectural design phase can be retained within the proposed development footprint; • Identification and protection of Black Cockatoo and Western Ringtail Possum habitat and significant trees that are to be retained outside of the proposed development footprint; • Clearing protocols to protect Black Cockatoo and Western Ringtail Possums both prior to and during clearing and construction activities; • A Western Ringtail Possum monitoring program to assess: - Derive a quantitative estimate of the population size within the site; and - Assess the immediate and long-term effects from the proposed development on the population within the site • Weed eradication program; • Detailed planting/landscaping plan for the proposed development footprint; • Revegetating degraded areas within the site with appropriate indigenous flora; • Soil and plant source material hygiene; • Controlling pedestrian and vehicle access to the site; • Water conservation principles; • Education program including signage, pamphlets and other means, to engage the residential community about the function of the Western Ringtail Possum and its habitat requirements; • Responsibilities for implementation; • Monitoring criteria to determine the success of the revegetation and weed eradication program;	Possum habitat will be cleared within the proposed development footprint. Conservation value habitat comprising approximately 2.83 ha located outside of the proposed development footprint will be retained, protected and enhanced in a reserve managed for its conservation values. No fauna species of conservation significance will cease to exist neither will their conservation status be adversely affected as a result of the implementation of the proposal. It is highly unlikely that the implementation of the proposal will have an adverse impact on fauna of conservation significance at a regional scale and those of a local scale are considered to be acceptable with rehabilitation of disturbed areas and the potential for environmental benefits from proposed offsets. At a local scale the availability of Western Ringtail Possum habitat over the short-term will decrease, however this will be compensated for by the potential for environmental benefits from proposed offsets including the rehabilitation of City of Busselton's Reserve 31645 with the planting of 1.8 ha of understorey vegetation and 700 native Peppermint trees. Reserve 31645 is a C class reserve zoned 'Recreation' located on Caves Road, Dunsborough and abuts the southern boundary of Peron Reserve a known Western Ringtail Possum habitat area. The rehabilitation of Reserve 31645 will result in infill of a fragmented habitat in this part of Dunsborough. No evidence of roosting, nesting or foraging by Black Cockatoos was observed within the proposed development footprint and it is anticipated therefore that there will be no significant impact upon either Black Cockatoo habitat or populations as a result of clearing the proposed development footprint. The EPA's environmental objective for Specially Protected (Threatened) Fauna will be achieved through restricting clearing to within the proposed footprint development and managing potentially adverse construction

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
				• Progress and compliance reporting; and • Timing and implementation schedule that specific management measures will occur on-site. A Revegetation and Rehabilitation Plan (RRP) will be developed in consultation with the City of Busselton and DSEWPaC for the offset site (Reserve 31645, Caves Road Dunsborough) proposed for revegetation and rehabilitation. The Proponent will be responsible for the implementation of the approved RRP for a period of three (3) years following which the City of Busselton will assume responsibility for implementation. The RRP will include but not be limited to: • Site details (including maps and coordinates); • Revegetation principles: - Methodology - Weed control - Soil preparation - Pest management - Planting schedule - Species Selection • Revegetation details; • Responsibilities for implementation; • Monitoring criteria to determine the success of the revegetation program; • Progress and compliance reporting; and • Timing and implementation schedule that specific management measures will occur at the offset site.	impacts through the implementation of a comprehensive EMP.
Soil Quality	Lots 111, 115, 116 and 117 Naturaliste Terrace, Dunsborough (~ 3984 m^2)	To ensure that rehabilitation achieves an acceptable standard compatible with the intended land use and consistent with appropriate criteria (Environmental Protection Authority, 2004).	Several areas of AEC have been identified that potentially could result in unacceptable health and environmental impacts. Predominant exposure pathways, through inhalation and ingestion, may impact on the health and well-being of residents.	A Detailed Site Investigation (DSI) will be conducted in accordance with the DEC's Contaminated Sites Management Series in order to assess the contamination status of the site, the associated environmental risks and any requirement for remedial action. The DSI will comprise the following: • Undertaking a Stage 2 DSI of the assessment area including: - EC1 (concrete ramp) – 2 soil bores > 1 mBGL (4 samples) - AEC2 (grey shed) – 5 soil bores > 1 mBGL (10 samples) - AEC3 (surface water) – surface and sediments samples (judgemental basis) (3 samples) • Analytical suite will be limited to a selection of common contaminants of concern: eight heavy metals (arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc), Total Petroleum Hydrocarbons (TPH) and	Based on the inferred extent and probably sources of contamination, and the remediation and validation that is proposed be implemented, it is considered that the proposed rehabilitation will achieve an acceptable standard compatible with the intended land use, and consistent with appropriate criteria. The EPA's environmental objective for Soil Quality will be achieved through managing potential contamination impacts through the implementation of a detailed site investigation and associated remediation and validation management plan should this be required.

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
				organochlorine/ organophosphorous pesticides (OC/OP Pesticides). • Reporting of the results of the DSI. Should the DSI identify areas of contaminated soil in excess of EIL criteria, a Site Remediation and Validation Plan will be prepared in consultation with the DEC and a Contaminated Sites Auditor and implemented in accordance with relevant DEC Guidelines for the remediation of contaminated soils. The site has been identified by the Western Australian Planning Commission (2009) as having a 'Moderate to Low Risk of acid sulfate soils (ASS) occurring within 3m of natural soil surface or deeper'. All assessment and management of ASS will be conducted in accordance with the Acid Sulphate Soil Guideline Series Identification and Investigation of Acid Sulfate Soils (DoE, 2004). If required, an Acid Sulfate Soils Investigation and Management Plan will be prepared and implemented in consultation with the DEC.	

1. INTRODUCTION

1.1 Rationale

This document presents the findings and conclusions of a formal environmental impact assessment (Public Environmental Review) undertaken for the proposed development of a portion of Armstrong Reserve, Naturaliste Terrace, Dunsborough in Western Australia as an aged care facility (**Figure 1**).

1.2 Summary of Proposal

The proposal will result in the construction of an aged care facility that will include an adult day care centre, a number of independent and supported living accommodation units, administration offices and community facilities to replace the existing Country Women's Association (CWA) building.

The facility is proposed to be constructed on a portion of the area known as Armstrong Reserve (the site) which comprises a number of 'C' class reserves currently reserved in the City of Busselton's Town Planning Scheme No. 20 for 'Recreation' (R25229, Lot 257 Naturaliste Terrace), the State Emergency Services (SES) Depot (R34732, Lot 116 Naturaliste Terrace) and the Shire Depot (R36468, Lots 116 and 111 Naturaliste Terrace) and the CWA site (Lot 115), 171 Naturaliste Terrace. Lot 258 bisects Armstrong Reserve and is currently reserved for 'Drainage' (R40445, Lot 258 Gifford Road) (**Figure 2**).

1.3 Project Proponent

The Proponent for the project is Ray Village Aged Services (Inc.) trading as Capecare, a not for profit community organisation involved in delivering aged care services to the South West region of Western Australia.

Contact details for the Proponent are as follows:

Company:	Ray Village Aged Services (Inc.) t/a Capecare (ABN: 77 630 127 279)
Contact Person:	Mr Greg Holland
Position:	Chief Executive Officer
Office Address:	20 Ray Avenue BUSSELTON WA 6280
Phone:	08 9750 2000
Fax:	08 9755 4696
Web:	www.capecare.com.au

1.4 Environmental Impact Assessment Process

1.4.1 State Assessment Process

1.4.1.1 Level of Assessment

In 2006, the Environmental Protection Authority (EPA) received a third party referral regarding the proposal by the Proponent to develop the site for the purposes of an aged care facility. The referral contended that the information provided to the EPA by the Proponent was insufficient to determine the significance of the impact of the proposed development on the environment. In November 2007 the EPA requested further information from the Proponent in order to assist in determining whether the environmental impacts of the proposal are significant and therefore warranting a formal environmental impact assessment (EIA).

In response to the EPA's request, the Proponent commissioned ATA Environmental (now Coffey Environments Pty Ltd) to undertake flora, vegetation and vertebrate fauna surveys and the associated reports were submitted to the EPA in April 2008. During the fauna surveys the Western Ringtail Possum (*Pseudocheirus occidentalis*) was recorded at multiple locations, including the area proposed for clearing within the site. The Western Ringtail Possum is listed as a Schedule 1 species (i.e. 'Fauna that is rare or likely to become extinct') under the Western Australian *Wildlife Conservation Act* (*1950)*, and as 'Vulnerable' under the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)* (EPBC Act).

In May 2008 the EPA requested advice from the Department of Environment and Conservation (DEC) Blackwood District office located in Busselton regarding the ecological values of the site. In August 2008, the EPA sent a Notice of Intention to set a level of assessment (LoA) as 'Proposal Unlikely to be Environmentally Acceptable (PUEA)' due to the presence of Western Ringtail Possum and the regional significance of the vegetation.

On the 17 November 2008, following consultation with the DEC with respect to reducing the proposed development footprint, the Proponent resubmitted a significantly redesigned development proposal to the EPA for their consideration. On the 17 December 2008 the EPA notified the Proponent of its intention to set the level of assessment as a PUEA and issued their Statement of Reasons for Level of Assessment (LoA).

In January 2009, the Proponent lodged an appeal with the Office of the Appeals Convenor against the LoA set by the EPA.

On the 26 August 2009, after considering the concerns raised in the appeals by Capecare, the advice of the EPA and the Appeals Convenor's report, the Minister for the Environment upheld the appeal.

Following the determination of the appeal on that decision (Appeal No. 001/09), the Minister for the Environment remitted the proposal to the EPA under Section 43 of the *Environmental Protection Act 1986* (EP Act) on 27 August 2009, for the proposal to be assessed more fully and more publicly.

In making this determination, the Minister provided the Proponent with the opportunity to:

(iv) Establish the environmental significance of the vegetation on Armstrong Reserve and demonstrate whether the proposal can be managed in an environmentally acceptable manner to protect these flora values;
(v) Determine the environmental significance of Armstrong Reserve as habitat for the Western Ringtail Possum and demonstrate whether the proposal could be managed in an environmentally acceptable manner to protect the local populations of this species;
(vi) Demonstrate that the proposal can be developed to be consistent with EPA policy, specifically Position Statement No. 2 *Environmental Protection of Native Vegetation in Western Australia*; and Position Statement No. 9 *Environmental Offsets*; and
(vii) Address the EPA's concern about the long-term viability of the remaining bushland on Armstrong Reserve.

Under Section 38 of the EP Act the EPA assigned the proposal a Public Environmental Review (PER) level of assessment with a 6 week public review period. The EPA's decision to assess the proposal was advertised in *The West Australian* newspaper on 21 September 2009 (EPA Assessment No. 1808).

1.4.1.2 Environmental Scoping Document

The initial step in the PER process for the proposed development was the preparation of an Environmental Scoping Document (ESD) to assist the EPA in ensuring that all significant issues are properly considered as part of the EPA's environmental impact assessment process of the proposal.

The principal objectives of the ESD were to define the scope of the impact assessment and to identify the specific studies and methodologies that would be used to support the assessment.

The ESD was prepared in accordance with the following documents:

- *Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002* (Environmental Protection Authority, 2002a)
- *Guide to Preparing an Environmental Scoping Document* (Environmental Protection Authority, 2010)
- *Guidelines for the Content of a Draft EIS* (Department of the Environment, Water, Heritage and the Arts, 2008).

Version 1 of the ESD was submitted to the OEPA in October 2010 and was referred to key State and Commonwealth stakeholders for review and comment prior to being returned to the Proponent's environmental consultant for revision of the ESD. Subsequently versions 2 to 4 were submitted and further revisions made to refine the ESD. Version 5 of the ESD was submitted to the EPA in October 2011 and was approved by the Chairman under delegated authority.

1.4.1.3 Public Environmental Review

This PER document has been prepared in accordance with the scope of works outlined in the approved ESD and the following document:

- *Guidelines for Preparing a Public Environmental Review* (Office of the Environmental Protection Authority 2010)

When the EPA is satisfied with the standard of the PER document it will provide a written sign-off to the Proponent, giving approval to advertise the document for public review. The document will be made publically available for a six week period following which the EPA will provide the Proponent with a summary of the issues raised in the public submissions and the Proponent will then respond to each of the submissions. In assessing the proposal, the EPA will consider the PER, issues raised by the public and the related Proponent's responses. Section 44 of the EP Act requires the EPA to report to the Minister for Environment on the outcome of its assessment of a proposal. The report must set out:

- The key environmental factors identified during the course of the assessment.
- The EPA's recommendations as to whether or not the proposal may be implemented, and if the EPA recommends that implementation be allowed, the conditions and procedures to which implementation should be subject.

The EPA's report will be published and can be appealed in terms of the report's content and recommendations. Appeals are dealt with by the Appeals Convenor. The Minister for Environment is responsible for making the final decision on whether the proposal can proceed.

1.4.2 Commonwealth Assessment Process

1.4.2.1 Commonwealth Referral (Reference No. 2006/2834)

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), sets out the way in which the Commonwealth Government is involved in the environmental impact assessment of certain projects or 'actions'.

An 'action' is defined broadly in the EPBC Act and includes a project, a development, an undertaking, an activity or series of activities, or an alternation of any of these things. An action may also encompass site preparation and construction, operation and maintenance, and closure and completion stages of a project, as well as alterations or modifications to existing infrastructure (Commonwealth of Australia, 2009).

The EPBC Act applies to 'actions' which:

- Have a significant impact on 'matters of National Environmental Significance'
- Are undertaken by Commonwealth government agencies and have a significant impact on the environment anywhere in the world; or
- Are undertaken by any person and have a significant impact on Commonwealth land (even if the activity is not actually carried out on the Commonwealth land).

A person who proposes to take an action that will have, or is likely to have a significant impact on any of the above, must refer that action to the minister for a decision on whether assessment and approval is required under the EPBC Act.

1.4.2.2 Matters of National Environmental Significance

An action may have both beneficial and adverse impacts on the environment, however only adverse impacts on matters of national environmental significance (NES) are relevant when determining whether approval is required under the EPBC Act (Commonwealth of Australia 2009). The matters of NES are:

- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Ramsar wetlands of international importance
- The Commonwealth marine environment
- World Heritage properties
- National heritage places
- Great Barrier Reef Marine Park
- Nuclear actions.

In May 2006, the Proponent referred the development proposal to the then Commonwealth Department of the Environment and Heritage (now known as the Department of Sustainability, Environment, Water, Population and Communities – DSEWPaC) for a decision on whether or not approval is needed under Chapter 4 of the EPBC Act.

On the 28 June 2006, the proponent was advised that the proposal to develop an aged care facility at Armstrong Reserve, Naturaliste Terrace, Dunsborough, Western Australia was determined to be a controlled action specifically due to potential impacts to the Western Ringtail Possum (*Pseudocheirus occidentalis*).

The Part 3, Division 1, controlling provisions are:

- Sections 18 and 18A (Listed threatened species and communities).

The related EPBC reference number is 2006/2834.

1.4.2.3 Bilateral Agreement

The Commonwealth and Western Australian governments have signed a bilateral agreement under s.45 of the EPBC Act to provide for accreditation of certain State environmental assessment processes. As the environmental assessment for the site will be undertaken under the bilateral agreement, the action will not require separate assessment under Part 8 of the EPBC Act (Colin Murray pers. comm. 26 November 2010).

The environmental impact assessment and approvals process through the implementation of the bilateral agreement is shown over the page on **Chart 1**.

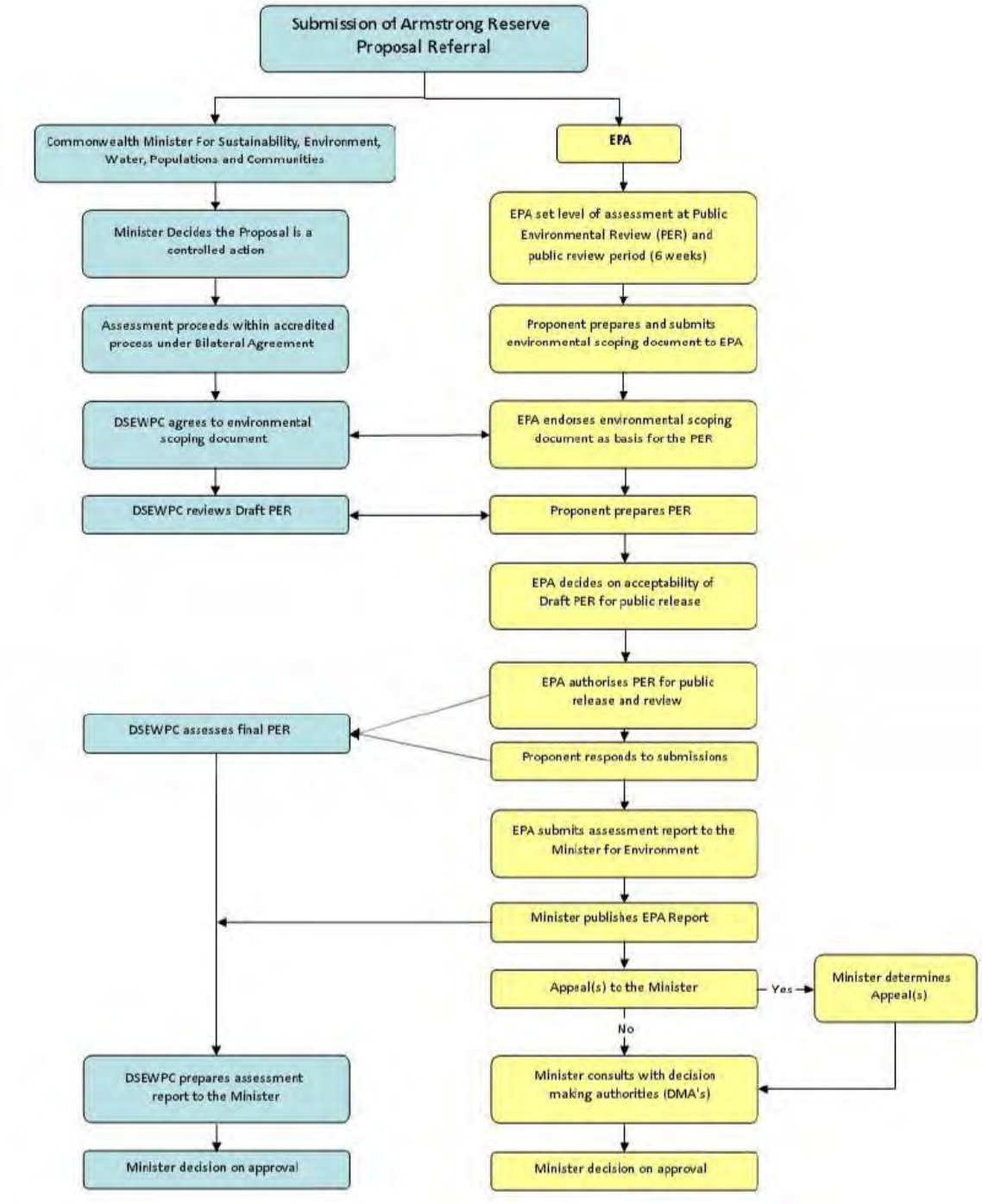

CHART 1: Bilateral Assessment and Approval Process
(Source: RPS Environment and Planning Pty Ltd, 2011)

1.5 Purpose of the PER

The purpose of this PER document is to:

- Place the proposal into its local and regional context.
- Address the environmental factors previously identified in the ESD prepared for the site (EndPlan Environmental Planning, 2011).
- Describe the potential environmental and social impacts of implementing the proposal.
- Provide the basis for the Proponent's environmental management program and indicate whether or not the environmental impacts resulting from the proposal, including cumulative impacts, can be minimised and acceptably managed.
- Set out the Proponent's rationale as to why the proposal should be deemed by the EPA, the DSEWPaC and the Ministers for the Environment to be environmentally acceptable.

1.6 Scope of the PER

The EPA has determined that the following environmental issues/factors are relevant to the proposal to develop an aged care facility at Armstrong Reserve, Dunsborough:

Biophysical Environment
- Native Vegetation and Flora
- Nominated Priority Ecological Community
- Specially Protected (Threatened) Fauna

Pollution Management
- Soil Quality

The application of each of these environmental issues/factors to the proposal to develop a portion of the site for the purpose of constructing an aged care facility is dealt with in **section 7**.

The regional conservation significance of the site has been determined using the six criteria defined in the EPA's Guidance for the Assessment of Environmental Factors No. 10 *Level of assessment for proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of System 1 region* (2006):

(i) Representation of Ecological Communities
(ii) Diversity
(iii) Rarity
(iv) Maintaining Ecological Processes or Natural Systems
(v) Scientific or Evolutionary Importance
(vi) General Criteria for Protection of Wetland, Streamline, and Estuarine Fringing vegetation and Coastal Vegetation

This determination included consideration of flora, vegetation, fauna, wetland and ecological linkage values (**section 6.12.4**).

1.7 Principles of Environmental Protection

In undertaking its assessment of the proposal, the EPA is required to have regard for the principles of environmental protection as set out in s.4A of the EP Act (Office of the Environmental Protection Authority, 2010b), namely:

- the precautionary principle
- the principle of intergenerational equity
- the principle of conservation of biological diversity and ecological integrity
- principles relating to improved valuation, pricing and incentive mechanisms
- the principle of waste minimisation

The application of each of these principles to the proposal to develop a portion of Armstrong Reserve for the purpose of constructing an aged care facility is dealt with in **section 8**.

1.8 Document Structure

The structure of this PER has been based upon the following documents:

- *Guidelines for Preparing a Public Environmental Review* (Office of the Environmental Protection Authority, 2010a)
- *Guide to EIA Environmental Principles, Factors and Objectives* (Office of the Environmental Protection Authority, 2010b)
- Advice received from DSEWPaC with respect to addressing matters of NES protected under the EPBC Act

2. KEY LEGISLATION, REGULATIONS, GUIDELINES AND POLICIES

2.1 Legislation and Regulations

In addition to meeting the requirements of the *Environmental Protection Act 1986*, the Proponent in developing the site is required to comply with, amongst others, any or all of a number of Acts of Parliament and Regulations at the State or Commonwealth level as listed in **Sections 2.1.1 and 2.1.2**.

2.1.1 State

- *Aboriginal Heritage Act 1972*
- Aboriginal Heritage Regulations 1974
- *Bush Fires Act 1954*
- *Conservation and Land Management Act 1984*
- Conservation and Land Management Regulations 2002
- *Contaminated Sites Act 2003*
- Contaminated Sites Regulations 2003
- *Country Towns Sewerage Act 1914*
- *Environmental Protection Act 1986*
- *Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002*
- *Fire and Emergency Services Authority of Western Australia Act 1998*
- *Land Administration Act 1997*
- *Local Government Act 1995*
- *Planning and Development Act 2005*
- *Wildlife Conservation Act 1950*

2.1.2 Commonwealth

- *Environment Protection and Biodiversity Conservation Act 1999*
- Environment Protection and Biodiversity Conservation Regulations 2000

Table 3 (over the page) lists the authorities and agencies with responsibilities in the proposed redevelopment of the site.

TABLE 3
AUTHORITIES AND AGENCIES WITH RESPONSIBILITIES IN THE PROPOSED DEVELOPMENT

AUTHORITY/AGENCY	RESPONSIBILITY
Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)	• Provides protection for matters of national environmental significance. • Joint assessment may be triggered if Commonwealth has jurisdiction. • Administers the *Environment Protection and Biodiversity Conservation Act 1999* and provides advice to the Minister.
Environmental Protection Authority	• Assesses reports and makes recommendations on proposals that may significantly affect the environment, including planning scheme amendments.
Office of the Environmental Protection Authority	• Assists the Environmental Protection Authority in the process of assessing proposals that may significantly affect the environment, including planning schemes.
Department of Environment and Conservation	• Manage conservation reserves vested in the crown. • Administer the *Wildlife Conservation Act 1950* and *Environmental Protection Act 1986.* • Regulates clearing of native vegetation under the EP Act and the *Country Areas Water Supply Act 1947.* • Administers pollution control legislation (*Contaminated Sites Act 2003*). • Advises on land use planning and development matters.
Department of Health	• Has responsibility for public health and safety issues including the provision of safe drinking water supplies and mosquitoes. • Administers the *Public Health Act 1911.*
Department of Water	• Proclaims public drinking water source areas and licenses some activities in these. • Regulates some activities and development in waterway management areas, and carries out some management functions.
Department of Planning	• Undertakes strategic and statutory planning. • Advises the Western Australian Planning Commission. • Land acquisition and management. • Administers the *Planning and Development Act 2005.*
Department of Lands (Landgate)	• Maintains the State's official register of land ownership and survey information and is responsible for valuing the State's land and property for government interest.
Fire and Emergency Services Authority of Western Australia	• Provides advice on the protection of life and property from wildfires. • Administers the following Acts: - *Bush Fires Act 1954* - *Fire and Emergency Services Authority of Western Australia Act 1998* - *Fire Brigades Act 1942*

City of Busselton	• Maintains public infrastructure including roads. • Carries out strategic and statutory planning. • Manages and maintains public open space and crown reserves. • Manages stormwater.

2.2 Project-specific Guidelines, Standards, Policies and Regulations

The proposal is subject to compliance with the following guidelines, policies, standards and regulations developed by the EPA and other State and Commonwealth agencies (e.g. Western Australian Planning Commission (WAPC) and Fire and Emergency Services Authority (FESA) and DSEWPaC).

The EPA has published a series of Environmental Assessment Guidelines, Environmental Protection Bulletins and Position and Guidance Statements which provide an indication of the EPA's views on matters of environmental importance and expectations about how to address specific factors (Office of the Environmental Protection Authority, 2010a).

The guidelines, policies, standards and regulations that are applicable to the proposal are shown on **Table 4**.

TABLE 4
APPLICABLE GUIDELINES, STANDARDS AND POLICIES

ENVIRONMENTAL PROTECTION AUTHORITY	
PROTECTION BULLETINS	Environmental Protection Bulletin No. 8 *South West Regional Ecological Linkages* (2009)
	Environmental Protection Bulletin No. 1 *Environmental Offsets – Biodiversity* (2008)
GUIDANCE STATEMENTS	*Guidance Statement for Remediation Hierarchy for Contaminated Land* No. 17 (2000)
	Level of Assessment for Proposals Affecting Natural Areas within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region Guidance Statement No. 10 (2003)
	Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia Final Guidance Statement No. 51 (2004a)
	Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia Final Guidance Statement No. 56 (2004b)
	Guidance Statement No. 19 *Environmental Offsets – Biodiversity* (2008a)
	Environmental Guidance for Planning and Development, Guidance Statement No. 33 (2008b)
POSITION STATEMENTS	Position Statement No. 2 *Environmental Protection of Native Vegetation in Western Australia*(2000)
	Position Statement No. 9 *Environmental Offsets* (2006)
ENVIRONMENTAL ASSESSMENT GUIDELINES	*Guide to EIA principles, factors and objectives* (2004)
	Environmental Assessment Guidelines No. 4 *Towards Outcome-based Conditions* (2009)
OTHER GOVERNMENT AGENCIES	
DSEWPaC (Commonwealth)	EPBC Act Policy Statement 3.10 "Significant impact guidelines for the vulnerable Western Ringtail Possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia" (DEWHA, 2009a)
	EPBC Act Environmental Offsets Policy Consultation Draft (DSEWPaC, 2011a)
	Matters of National Environmental Significance – significant impact guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia, 2009)
	Draft referral guidelines for three species of Western Australian Black Cockatoos' (DSEWPaC, 2011b)
DEC	Draft Treatment and Management of Soils and Water in Acid Sulfate Soil Landscapes

	(2009b)
	Acid Sulfate Soils Guidelines Series Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes (DEC, 2009a)
	Assessment Levels for Soil, Sediment and Water (DEC, 2010a)
WAPC	State Planning Policy 2.9 Water Resources (2006a)
	State Planning Policy 3.4 Natural Hazards and Disasters (2006b)
WAPC and FESA	Planning for Bush Fire Protection Guidelines (2010)

2.2.1 EPBC Act Significant Impact Guidelines 1.1

The purpose of the Matters of National Environmental Significance – significant impact guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia, 2009) is to assist proponents who propose to take an action to decide whether or not they should submit a referral to the DSEWPC for a decision by the Australian Government Environment Minister (the Minister) on whether assessment and approval is required under the EPBC Act. Under the EPBC Act an action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance (NES).

2.2.2 EPBC Act Policy Statement 3.10

In relation to the Western Ringtail Possum, the DSEWPaC has developed the EPBC Act Policy Statement 3.10 "*Significant Impact Guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan Coastal Plain, Western Australia*" (DEWHA, 2009a). The Guidelines identify three key Western Ringtail Possum habitat areas and describes the significant impact thresholds associated with each area. The key areas include:

Area 1 – Core habitat
- Clearing in a remnant habitat patch that is > 0.5 ha in size;
- Clearing of more than 50% of a remnant habitat patch that is between 0.1 and 0.5 ha in size; or
- Fragmentation of existing habitat linkages.

Area 2 – Primary corridors
- Clearing in a remnant habitat patch that is > 0.5 ha in size;
- Clearing of more than 50% of a remnant habitat patch that is between 0.1 and 0.5 ha in size;
- Fragmentation of existing habitat linkages; or
- Degradation or sterilisation of an area to the extent that appropriate habitat could not be enhanced or re-established in the future.

Area 3 – Supporting habitat
- Clearing in a remnant habitat patch that is > 0.5 ha in size;
- Clearing of more than 50% of a remnant habitat patch that is between 0.2 and 0.5 ha in size; or
- Fragmentation of existing habitat linkages.

The policy also recommends measures to mitigate the impacts to the Western Ringtail Possum from development with *in situ* conservation and habitat augmentation being recognised as the priority mitigation measures (DEWHA, 2009a and 2009b). The site is located in Area 3 – Supporting habitat.

2.2.3 EPBC Act Environmental Offsets Policy

The draft *EPBC Act Environmental Offsets Policy* (DSEWPaC, 2011) outlines the Australian Government's proposed framework on the use of environmental offsets under the EPBC Act 1999 including when they can be required, how they are determined and the framework under which they operate. The draft Environmental Offsets Policy has four key aims, which are to:

1. Ensure the efficient, effective, transport, proportionate, scientifically robust and reasonable use of offsets under the EPBC Act.
2. Provide proponents, the community and other jurisdictions with greater certainty and guidance on how offsets are determined and applied under the EPBC Act.
3. Deliver improved environmental outcomes by consistently applying offsets policy.
4. Explain the Government's position on a range of issues include:
    a. When it is appropriate to consider offsets as part of a project.
    b. The appropriate nature and scale of offsets.
    c. The use of market-based instruments for the delivery of offsets.

2.2.4 Draft Referral Guidelines for the Threatened Black Cockatoo Species

The *Environment Protection and Biodiversity Conservation Act 1999* draft referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris,* Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii,* Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso* (DSEWPaC, 2012) are intended to assist landowners in determining whether a proposed action will have a significant impact on any of the three black cockatoo species and would therefore need to be referred to the DSEWPaC. The DSEWPaC notes that the guidelines are to be read in conjunction with the *EPBC Act Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance* (DEWHA, 2009).

2.2.5 Environmental Protection Bulletin No. 1

Environmental Protection Bulletin No. 1 *Environmental Offsets – Biodiversity* (Environmental Protection Authority, 2008) recognises that environmental offsets are a package of activities undertaken to counter adverse environmental impacts arising from a development that can help achieve sustainable outcomes to ensure the protection and improvement of the environment while still allowing for development. The EPA advises that environmental offsets should be used with a goal of achieving a net environmental benefit and only be considered after all efforts to avoid and minimise environmental impacts have been made and significant environmental impacts still remain (Environmental Protection Authority, 2008).

2.2.6 Environmental Protection Bulletin No. 8

In Environmental Protection Bulletin No. 8 *South West Regional Ecological Linkages* (Environmental Protection Authority, 2009) the EPA recognises that a state wide

comprehensive, adequate and representative CAR reserve system to protect Western Australia's biodiversity values would be strengthened by the retention and restoration of well-planned and managed ecological linkages. Ecological linkages are one measure of the biodiversity conservation values of a patch of native vegetation and that such linkages would ameliorate the threatening impacts on flora and fauna of habitat fragmentation and promote the maintenance of ecosystem function and the conservation of many native species in the south west region of Western Australia.

The EPA expects that in preparing plans and proposals for development, consideration will be given to both the site-specific biodiversity conservation values of 'patches' of native vegetation as well as the landscape function and core linkage significance of a patch in supporting the maintenance of ecological linkage (Environmental Protection Authority, 2009).

2.2.7 Guidance Statement No. 10

Guidance Statement No. 10 *Level of Assessment for Proposals Affecting Natural Areas within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region* (Environmental Protection Authority, 2006b) addresses the environmental assessment of proposals, planning schemes and scheme amendments involving the clearing of, or other significant impacts upon, natural areas within the System 6 Region and Swan Coastal Plain portion of the System 1 Region. Where vegetation clearing is not the only significant environmental issue a proposal should be referred to the EPA which will then determine whether the proposal should be assessed pursuant to Part IV of the EP Act (Environmental Protection Authority, 2006b).

2.2.8 Guidance Statement No. 19

Proposed developments that are likely to have significant adverse impacts on 'high' or 'critical' value environmental assets require referral to the EPA through the preparation and submission of an EIA document. Guidance Statement No. 19 *Environmental Offsets – Biodiversity* (Environmental Protection Authority, 2008a) identifies that the EIA is to include a presentation of mitigation activities through a risk assessment approach and inclusion of the Environmental Offsets reporting form. The EPA notes that environmental offsets should only be considered after all other reasonable attempts to mitigate adverse environmental impacts have been exhausted and evidence of this should be clearly demonstrated when presenting an offsets package (Environmental Protection Authority, 2008a).

2.2.9 Guidance Statement No. 33

Guidance Statement No. 33 *Environmental Guidance for Planning and Development* (Environmental Protection Authority, 2008b) provides decision-making authorities, proponents and others with guidance and information with respect to the EPA's expected standards and protocols for achieving environmentally acceptable outcomes in the land development industry in Western Australia. The main purposes of this EPA guidance statement are to:

- Provide information and advice to assist participants in land use planning and development processes to protect, conserve and enhance the environment
- Describe the processes the EPA may apply under the EP Act to land use planning and development in Western Australia, and in particular to describe the EIA process applied by the EPA to

- Provide the EPA's advice on a range of environmental factors in order to assist participants in land use planning and development schemes (Environmental Protection Authority, 2008b).

2.2.10 Guidance Statement No. 51

Guidance Statement No. 51 *Terrestrial Flora and Vegetation surveys for Environmental Impact Assessment in Western Australia* (Environmental Protection Authority, 2004a) provides environmental consultants and proponents with guidance and information with respect to the EPA's expected standards and protocols for terrestrial flora and vegetation surveys for EIA in Western Australia; and is primarily directed at the subset of biodiversity contained in all vascular plants. Information contained in the Guidance Statement includes the quality and quantity of information that should be derived from surveys, and the consequent analysis, interpretation and reporting (Environmental Protection Authority, 2004a)

2.2.11 Guidance Statement No. 56

Guidance Statement No. 56 *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (Environmental Protection Authority, 2004b) provides environmental consultants and proponents engaged in EIA activities within Western Australia direction and information on the EPA's expectations with respect to general standards and protocols for terrestrial fauna surveys (Environmental Protection Authority, 2004b). It also address the general standards and a common framework for terrestrial fauna and fauna assemblages for EIA, the quality and quantity of information derived from these surveys and the consequent analysis, interpretation and reporting that is directed at a subset of biodiversity contained in all terrestrial faunal groups (Environmental Protection Authority, 2004b).

2.2.12 Position Statement No. 2

Position Statement No. 2 *Environmental Protection of Native Vegetation in Western Australia-Clearing of Native Vegetation, with Particular Reference to the Agricultural Area* (Environmental Protection Authority, 2000a) provides the EPA's view with respect to clearing of native vegetation within the agricultural area. The 'agricultural area' to which this statement applies (identified in Figure 1 of the document) is bounded in the east by the agricultural clearing line, the western boundary follows the System 6 boundary from Moore River (north of Perth) southward, until the point where the System 6 boundary heads westward, then the Shire of Boyup Brook boundary is followed eastward to intersect with the Regional Forest Agreement boundary which is followed southwestward to the ocean.

For areas outside of the designated agricultural area, in consideration of the consequences of proposals for biological diversity, the EPA in assessing proposals will focus on the principles and the related key objectives of the National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth of Australia, 1996).

2.2.13 Position Statement No. 9

Environmental Offsets Position Statement No. 9 (Environmental Protection Authority, 2006a) sets out the EPA's vie on environmental offsets establishing the purpose, scope and principles for environmental offsets. Environmental offsets aim to ensure that significant and

unavoidable adverse environmental impacts are counterbalanced by a positive environmental gain, with an aspirational goal of achieving a 'net environmental benefit' (Environmental Protection Authority, 2006). The EPA considers that environmental offsets should be included, where appropriate, as part of the approvals for environmentally acceptable projects to maintain and wherever possible enhance the State's environment.

2.2.14 Contaminated Sites Management Series Guidelines

The DEC has developed the Contaminated Sites Management Series of guidelines to assist with the assessment and management of contaminated sites in Western Australia in keeping with the requirements of the *Contaminated Sites Act 2003* and the Contaminated Sites Regulations 2003. The guidelines have been prepared to assist local government authorities, planners, consultants, industry and the general public in identifying potential contaminants associated with specific activities/industries, and in reporting on the investigation, remediation and validation of contaminated land and groundwater in Western Australia (Department of Environment and Conservation, 2010a).

2.2.15 State Planning Policy 2.9

State Planning Policy 2.9 Water Resources (Government of Western Australia, 2006) is made under Section 26 of the *Planning and Development Act 2005*. The principal objectives of SPP 2.9 are to:

- Protect, conserve and enhance water resources that are identified as having significant economic, social, cultural and/or environmental values
- Assist in ensuring the availability of suitable water resources to maintain essential requirements for human and all other biological life with attention to maintaining or improving the quality and quantity of water resources; and
- Promote and assist in the management and sustainable use of water resources.

The Western Australian Planning Commission's *Better Urban Water Management* publication (2008) has been formulated as part of the strategy for implementing water sensitive urban design on the Swan Coastal Plain, with particular regard for the Swan-Canning and Vasse-Geographe catchments. The document provides guidance on the implementation of SPP 2.9 which is a requirement for the *State Water Strategy for Western Australia* (Government of Western Australia, 2003).

The approach outlined in *Better Urban Water Management* is not intended to apply in brownfield or infill circumstances or to small scale subdivision or development proposals unless significant water management issues are present (Western Australian Planning Commission, 2008). Instead, development will be consistent with the principles of *State Planning Policy 2.9 Water Resources* (Western Australian Planning Commission, 2006) and the *Stormwater Management Manual for WA,* including the decision process which forms part of the manual (Department of Water, 2004-2007).

2.2.16 State Planning Policy 3.4

The purpose of State Planning Policy 3.4: Natural Hazards and Disasters (April, 2006) is to inform and guide the WAPC in the undertaking of its planning responsibilities, and in

integrating and coordinating the activities of State agencies that influence the use and development of land that may be affected.

Consistent with the purpose of the policy, the objectives of this policy are to:

- Include planning for natural disasters as a fundamental element in the preparation of all statutory and non-statutory planning documents, specifically town planning schemes and amendments, and local planning strategies; and

- Through the use of these planning instruments, to minimise the adverse impacts of natural disasters on communities, the economy and the environment.

2.2.17 Bush Fire Protection Guidelines

The Department of Planning in collaboration with the FESA, has undertaken a review of bush fire planning guidelines and Development Control Policy 3.7 Fire Planning (DC 3.7 Fire Planning) that have been rescinded by the WAPC.

The new revised guidelines, *Planning for Bush Fire Protection Guidelines* (Edition 2, 2010), were released as interim guidelines and will be subject to further review and finalisation following the release of the 2009 Victorian Bushfires Royal Commission final report. To date, Edition 2 has not been superseded.

The interim planning guidelines have been prepared in accordance with State Planning Policy 3.4 *Natural Hazards and Disasters* and set out matters that need to be addressed at various stages of the planning process in order to provide an appropriate level of protection to life and property from bush fires and avoid inappropriately located or designed land use, subdivision and development on land where a bush fire risk is identified.

3. STAKEHOLDER ENGAGEMENT

3.1 Nature of Engagement

Since 2004, the Proponent has undertaken ongoing community consultation including meetings and workshops regarding the proposal. Consultation has focused upon issues relating to the need for aged care facilities being provided for the Dunsborough community, assessing alternative sites in and around Dunsborough for the facility to be constructed upon and revising the extent of a development footprint in order to reduce environmental impacts on the local Western Ringtail Possum population and nominated Priority Ecological Community (PEC).

The Proponent's consultation program has included engaging with the following stakeholders:

Government Agencies
- Environmental Protection Authority
- Office of the Environmental Protection Authority
- Department of Environment and Conservation
- Fire and Emergency Services Authority
- Department of Sustainability, Environment, Water, Population and Communities

Local Government
- City of Busselton

Local Community
- Local environmental groups
- CWA
- Dunsborough residents
- Local members of Parliament

The consultation programme has resulted in the City affirming their commitment to relocate the Shire Depot, and the CWA agreeing to be co-located within the proposed Day Care Centre in a purpose built portion of the building, to be for the exclusive use of the CWA.

The Proponent's initial concept plan for the proposed aged care facility was presented in the EPBC referral (2006/2834) identifying the proposed development footprint as encompassing the whole of the site (**Figure 5a**). In 2010, following extensive consultation with the Department of Environment and Conservation's (DEC) Blackwood District Office regarding the potential environmental impacts of the proposed development, the scale of the revised concept plan was reduced to cover approximately 50% of the site thereby avoiding what was then thought by the DEC to be a Threatened Ecological Community (TEC) and also to reduce the impact on the Western Ringtail Possum habitat (**Figure 5b**).

Following further consultation and comments received from key agencies through the development of the Environmental Scoping Document, the Proponent has identified a proposed development footprint that incorporates Lots 111, 115, 116, 117 and an 9994 m^2 portion of Lot 257 (**Figure 6**). The proposed development footprint as presented in this PER comprises approximately 1.28 ha or 30% of the overall site.

Information pertaining to the issues that have been raised during the community consultation undertaken to date including: correspondence, notes taken at community meetings, and a list of newspaper articles relating to the proposal are included as **Appendix 1**.

3.2 Government Regulator Consultation

In relation to the use of the site by the local population of Western Ringtail Possum, the Proponent has liaised with the DSEWPaC and the following sections of the DEC:

- Blackwood District Office, Busselton - in relation to reducing the development footprint from the original Concept Plan to increase the area of Western Ringtail Possum habitat and nominated PEC being retained; and
- Western Australian Wildlife Research Centre - in relation to alternative methodologies to assess the use of the site by the Western Ringtail Possum and implementation of mitigation measures to protect fauna during the development process.

4. PROPOSAL JUSTIFICATION AND OBJECTIVES

4.1 Justification

The City of Busselton is one of the fastest growing non-metropolitan local government areas (Shire of Busselton, 2011). The Australian Bureau of Statistics (ABS) 2006 estimate of resident population within the City is 26,638, an increase of 15.3% during the inter-censal period. During the period 1996-2001 the City experienced an average annual growth rate of 4.9% while from 2001-2006 the rate reduced to 2.9%; during the same latter period, the State average was 1.6% (Shire of Busselton, 2011). Projected population growths for the inter-censal period to 2010 shows annul growth rates varying from 2.9% (2006) followed by rates of 4.7% and 4.5% prior to retracting to 4.3% (2009) (Australian Bureau of Statistics, 2010).

Census data collected by the ABS between 1996 - 2006 shows that Dunsborough has also experienced a marked increase in population from 2100 (1996); 2980 (2001); and 3690 (2006) (Shire of Busselton, 2011). As shown on **Table 5**, Dunsborough is expected to experience an Average Annual Growth Rate (AAGR) of 3.7% over the period 2006 to 2011 (Shire of Busselton, 2011).

TABLE 5
POPULATION PROJECTIONS – CITY OF BUSSELTON 2006-2011

	2006[a]	**2011[b]**	**2016**	**2021**	**2026**
Busselton	17,890	20,222[1]	**No individual/itemised data is available for this period**		
Dunsborough	3,690	4,450[2]			
Yallingup (hamlet)	156	170[3]			
Eagle Bay (hamlet)	63	80[3]			
Vasse village	75	1,000[4]			
Carbunup River (hamlet)	46	50[5]			
Urban Total	**21,920**	**25,950**			
Rural Total	**4,718**	**5,100[6]**			
Shire Total	**26,638**	**31,200[7]**	**34,686[8]**	**39,977[8]**	**46,279[8]**

Note:
1. Based on Average Annual Growth Rate (AAGR of 2.5%).
2. Based on AAGR of 3.8%.
3. Based on low occupancy of dwellings.
4. Vasse village may have an ultimate population of approximately 5,000.
5. No new development.
6. Based on AAGR of approximately 1.6%.
7. AAGR of approximately 3.2%.
8. Shire of Busselton Local Settlement Planning Strategy

Source:
a. Australian Bureau of Statistics – Regional Population Growth 2005-2006
2006 Census of Population and Housing
b. Shire of Busselton (2011)

Table 6 shows the projected population increases by age group for the City of Busselton for the period 2006-2051. The data has been extracted from the City of Busselton's document *Demography and Planning 2011* (2011) which identifies population projections from 0 – 85+ age groups. In this instance, the data chosen is for age groups 65-85+ which is the client profile for aged care facility users. The totals shown are projected populations for the whole of the City as identified in the City's *Local Settlement Planning Strategy* (Land inSights, 2009). *The*

Local Settlement Planning Strategy (LSPS) has been formulated to provide a long term strategic land use planning framework for future settlement patterns and growth within the City and addresses the provision of sustainable land use for: future urban development; housing; infrastructure and transport. The LSPS will form an important component of the City of Busselton's Local Planning Strategy and underpin revised zoning proposals for a new Local Planning Scheme (Land inSights, 2009).

TABLE 6
POPULATION PROJECTIONS BY AGE GROUP (PROPORTIONAL %)

AGE GROUP	2006	2011	2016	2021	2026	2031	2036	2041	2046	2051
65-69	4.5%	4.7%	5.3%	5.8%	5.9%	5.7%	5.3%	4.8%	4.2%	4.0%
70-74	3.6%	4.0%	4.2%	4.6%	5.0%	5.2%	5.0%	4.7%	4.3%	3.8%
75-79	3.1%	3.0%	3.3%	3.4%	3.7%	4.1%	4.3%	4.2%	3.9%	3.6%
80-84	2.2%	2.3%	2.3%	2.5%	2.5%	2.8%	3.1%	3.3%	3.2%	3.0%
85+	1.7%	2.3%	2.8%	3.0%	3.2%	3.4%	3.7%	4.1%	4.4%	4.6%
Total	**26,585**	**30,340**	**34,686**	**39,997**	**46,279**	**53,426**	**61,221**	**69,803**	**79,212**	**90,107**

Given that in **Table 5** the AAGR for Busselton was 2.5% and for Dunsborough 3.8%, it can be assumed that the proportion of retirees in the 55-85+ age groups choosing to settle in the City of Busselton will increase proportionally, therefore the demand for places in retirement villages and aged care facilities will also increase proportionally placing increasing pressure on existing facilities within the City.

In 2004, following a long history of caring for the aged at their Ray Village facility in Busselton that was established in 1961, the Proponent recognised that there was already a high level of unmet demand for aged care facilities in the Dunsborough area and consequently became proactive in searching for a site that was affordable, in a location that would provide amenity to the aged and frail and that over time would be of sufficient size to enable a variety of facilities to be constructed to meet the increasing demand.

In February 2005 the then Minister for Planning and Infrastructure (now Department of Planning - DoP) wrote to the Chief Executive Officer of Ray Village Aged Services (Inc.) giving 'agreement in principle' support to the transfer of the various titles comprising Armstrong Reserve to the Proponent subject to the following conditions being met:

- Appropriate public consultation being undertaken by the Proponent to the satisfaction of the DPI and the then Shire of Busselton showing community support for the use of the land by the Proponent.
- That the Proponent submit to the DoP and the Shire for consideration a proposal to meet public consultation requirements.
- Formal support from the Shire to use the reserve and the transfer of the land to the Proponent.
- Rezoning of the reserve.
- Environmental approvals for the development of the reserve.
- At the conclusion of the above, the Proponent submitting to the Minister a final detailed proposal supporting the community benefit of the proposal.

- The Country Women's Association (CWA) agreeing to surrender its current title.
- The Proponent agreeing to the CWA's continued use of the site.
- The Proponent agreeing to meet all costs associated with the transfer, including statutory and administrative costs and any requirements for the rezoning of the land that may be necessary.

4.2 Alternative Locations Considered

At a Seniors Forum meeting held in Dunsborough in March 2004 various tracts of land were identified as potential sites under consideration for the purpose-built aged care facility. Sites under consideration included:

Site 1: Water Corporation land - Lot 10 Commonage Road Dunsborough (former Dunsborough sewage disposal site).

Site 2: Old Quindalup town site located on Caves Road between Harwoods and the Butterfly Park. The site is now known as the Old Police Reserve (Reserve 16920 – Lot 4731, 968 Caves Road Quindalup).

Site 3: Busselton Shire Depot land between Naturaliste Terrace and Gifford Road, Dunsborough.

Figure 3 shows the location of each of the sites identified above.

At the meeting an overview of each of the three alternative sites was presented by Mr John Reid (Chairman, Ray Village Aged Services) and discussion ensued regarding each site's suitability among the meeting attendees and representatives of the Proponent.

4.2.1 Site 1 – Dunsborough Sewage Disposal Site

With respect to **Site 1**, the following factors were considered:

- The land was located too far from the town centre to enable walking/wheel chair access to it and that this may promote a sense of isolation for residents; and
- The site was a long way from the beach and other amenities.

An inspection of Site 1 undertaken by *EndPlan Environmental* (*EndPlan*) in February 2011 found that portions of the site have historically been cleared (areas for grazing and at the southern end of the site for the wastewater treatment plant (WWTP) which has been fenced). Roadside vegetation along the southern boundary of the site comprises predominantly mature Marri (*Corymbia calophylla*) with a diverse understorey. Inside the fenced off WWTP area, the vegetation is predominantly *Casuarina* species.

4.2.2 Site 2 – Old Quindalup Townsite

With respect to **Site 2**, the following factors were considered:

- The site was located too far from the town centre to enable walking/wheel chair access to it and that this may promote a sense of isolation for residents;
- No existing/planned footpath into the town centre making it difficult for walking/wheelchair access to the town centre;
- Caves Road is a very busy road with high volumes of traffic;

- High levels of traffic noise currently experienced with the likelihood of these levels increasing; and
- The site was a long way from the beach and other amenities.

An inspection of Site 2 was undertaken by *EndPlan* in February 2011. Although the site appears to have been historically parkland cleared, it contains a mature Peppermint overstorey with some areas of interlocking canopy and in areas closer to the wetland a relatively well developed understorey of Coastal Sword Sedge. Revegetation work has recently been undertaken over the eastern portion of the site as part of the development of a walking trail. The southern portion of the site, adjacent to the wetland, is very low-lying with scattered *Melaleuca* sp. present. The presence of extensive areas of sedges and samphire would indicate that this portion of the site is likely to be subject to seasonal inundation.

As the site is contiguous with the Geographe Coastal Wetland system, it is likely that the site will have buffer issues that would require a significant setback to development.

4.2.3 Site 3 – Armstrong Reserve

With respect to **Site 3**, the following factors were considered:

- The site was located close to the town centre and the beach thereby enabling walking/wheel chair access to both amenities;
- The site was located in the middle of an existing community, close to friends, family and familiar places and this would be beneficial a sense of belonging to a community for the facility's residents;
- The levels of traffic noise currently experienced were low as the surrounding roads have a 50 km/hr speed limit;
- An important part of the design of the facility would be maintaining the natural environment and with good engineering make the drainage reserve a feature of the site; and
- The site was large enough to incorporate public open space/bushland buffer to the facility.

A number of Level 2 flora and vegetation surveys have been undertaken at Site 3 (ATA Environmental, 2005; Coffey Environments, 2008 and Ecoscape, 2010). These surveys identified that while Site 3 contains some cleared areas, the remainder of the site is covered with dense vegetation in very good to excellent condition.

Information pertaining to the discussions held at the public meeting regarding Sites 1 to 3 (inclusive), along with other documents relating to community consultation, is included in **Appendix 1.**

4.3 Proposal's Relation to other Proposals

The proposal to develop a portion of the site (i.e. the development footprint) for the purposes of constructing an aged care facility is a 'stand-alone' proposal.

5. PROJECT DESCRIPTION

5.1 Overview of Proposal

The Proponent is a not-for–profit community organisation involved in delivering aged care services to the South West region of Western Australia. Increasing demand for aged care services in the Dunsborough area led the Proponent to identify the site as a possible location for the development of aged care facilities. Facilities proposed to be developed include an adult day care centre, independent and supported living accommodation units, administration offices and community facilities to replace the existing Country Women's Association (CWA) building.

The site comprises approximately 4.22 ha and is located approximately 500 m north of the business centre of the town of Dunsborough and is bounded by Armstrong Place, Gifford Road and Naturaliste Terrace (**Figure 1**).

The site's geographic (latitude/longitude) extent is shown in **Table 7**.

TABLE 7
GEOGRAPHIC (LATITUDE/LONGITUDE) EXTENT

LOCATION POINT	LATITUDE			LONGITUDE		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
NW	33	36	39.4	115	06	11.7
NE	33	36	37.3	115	06	21.4
SW	33	36	41.7	115	06	13.3
SE	33	36	41.0	115	06	22.2

5.2 Land-use Zoning

The site is situated within the municipal boundary of the City of Busselton within the Dunsborough town site and is zoned 'Recreation' and 'Drainage' under the City's Town Planning Scheme No. 20 (TPS20). Directly to the west of Naturaliste Terrace is Marri Reserve (also zoned 'Recreation') while to the north, south and east the land is zoned 'Residential' (R15-30) (refer to **Figure 4**).

Figure 2 shows the existing environment of the site including the cadastre identifying the location of each of the Lots relative to each other. As shown in **Figure 2**, Armstrong Reserve (Lot 257 - R25229) is effectively divided into two halves by a Drainage Reserve (Lot 258 - R40445): the northern portion comprises approximately 1.74 ha and the southern portion comprises approximately 1.76 ha.

5.3 Proposed Development Footprint

The Proponent's initial concept plan for the proposed aged care facility was presented in the EPBC referral (2006/2834) identifying the proposed development footprint as encompassing

the whole of the site (**Figure 5a**). The scale of the proposal and its likely impact on matters of NES resulted in the proposed action being declared a "controlled action" by the DSEWPaC.

In 2010, following extensive consultation with the DEC's Blackwood District Office, the scale of the revised concept plan was reduced to cover approximately 50% of the site thereby avoiding what was then thought by the DEC to be a Threatened Ecological Community (TEC) and also to reduce the impact on the Western Ringtail Possum habitat (**Figure 5b**).

As a result of further consultation and comments received from key agencies through the development of the ESD, the Proponent has identified a proposed development footprint that incorporates Lots 111, 115, 116, 117 and an 9994 m^2 portion of Lot 257 (**Figure 6**). The proposed development footprint comprises approximately 1.28 ha or 30% of the overall site.

While approximately 4332 m^2 of the proposed development footprint has been historically cleared, 9020 m^2 of Western Ringtail Possum habitat (incorporating 4352 m^2 of the nominated PEC which also forms part of the Western Ringtail Possum habitat) will need to be cleared for the proposed development to be constructed.

5.4 Proposal Ownership and Liability

As discussed in **Section 5.4** the site is comprised of a number of lots that are currently vested in other legal entities. The current Certificate of Title details for each of the lots is shown on **Table 8**.

In accordance with the Western Australian *Town Planning and Development Act 2005*, rezoning of the proposed development footprint is required to be undertaken prior to development commencing. Assuming rezoning is approved, a new Certificate of Title will be created for the area contained within the proposed development footprint. This land will become the legal responsibility of the Proponent and will be retained as one Title in perpetuity. A new Certificate of Title will also be created for the remainder of the site that is located outside of the proposed development footprint. The Proponent has liaised with the City of Busselton with respect to the long-term management options available for the remainder of the site located outside of the proposed development footprint. During this process, the City has advised the Proponent that it would be willing to retain the vesting of the remainder of the site and manage it as Conservation POS (P. Malavisi pers. comm.). The planning process that will be entered into should State and Commonwealth environmental approvals be granted, will involve the rezoning followed by subdivision/amalgamation of the affected lots. Currently Lot 257 is identified as 'Recreation' under the City of Busselton's TPS No. 20. The City of Busselton has indicated that with respect to the area of Lot 257 that is outside of the proposed development footprint, the City will recommend to the Department of Lands that the legal use be changed from 'Recreation' to 'Landscape Protection' (P. Malavisi pers. comm.). Furthermore, the City has advised that it has no objection to the amalgamation of the lots south of Lot 258 and that this process will be dealt with by the Department of Lands. The proposed development footprint will continue to be identified on the Scheme map as 'Recreation' until such time that the City has an omnibus amendment which will then likely change the identification in the Scheme to 'Special Purpose Zone – Aged Persons' (P. Malavisi, pers. comm.).

The future timing of the proposed development is dependent upon the successful resolution of outstanding issues including the State and Commonwealth environmental approvals process and rezoning of the proposed development footprint. Construction of the proposed aged care facility is anticipated to commence in 2014 subject to all necessary regulatory approvals being obtained.

TABLE 8
CERTIFICATE OF TITLE DETAILS

DETAILS AS SHOWN ON CERTIFICATE OF TITLE				
Lot No. / Deposited Plan (DP)	**Certificate of Title (Volume/Folio)**	**Street Address**	**Date**	**Proprietor**
Lot 111 on DP 207085	3140/192	167 Naturalise Terrace, Dunsborough, WA	Current	Shire of Busselton
Lot 115 on DP 207085	1222/568	171 Naturalise Terrace, Dunsborough, WA	Current	The Country Women's Association of Western Australia Inc.
Lot 116 on DP 207085	3140/194	169 Naturaliste Terrace, Dunsborough, WA	Current	State of Western Australia
Lot 117 on DP 207085	3140/193	167 Naturaliste Terrace, Dunsborough, WA	Current	Shire of Busselton
Lot 257 on DP 207085	3004/138	Naturaliste Terrace, Dunsborough, WA	Current	Shire of Busselton
Lot 258 on DP 216711	3141/802	100F Gifford Road, Dunsborough, WA	Current	State of Western Australia

5.5 Proposal Key Characteristics

Key characteristics of the proposal are provided in **Table 9.**

TABLE 9
PROPOSAL KEY CHARACTERISTICS

PROPOSAL TITLE	Aged Care Facility Development, Armstrong Reserve, Dunsborough
PROPONENT NAME	Ray Village Aged Services (Inc.) t/a Capecare
SHORT DESCRIPTION	The proposal is to develop a 1.28 ha portion of the site for the purpose of constructing an aged care facility.
PHYSICAL ELEMENTS	The proposed development footprint comprises 1.28 ha of the site as identified on **Figure 2** consisting of Lots 111, 115, 116, 117 and an 9994 m^2 portion of Lot 257.
OPERATIONAL ELEMENTS	The facility will consist of: - Adult day care centre - A number of independent and supported living accommodation units (buildings will be 2-3 storeys in height) - Administration offices and community facilities (including meeting rooms for the CWA) - Internal road network - Two-way road access between the proposed development footprint and Naturaliste Terrace and Gifford Road Identified on **Figure 6**.
SIGNIFICANT VEGETATION	The proposed development footprint will require the removal of 9020 m^2 of Western Ringtail Possum habitat including 174 Native Peppermint (*Agonis flexuosa*) trees. This area also comprises 4352 m^2 of a nominated Priority 1 Ecological Community (PEC) identified on **Figures 8, 9 and 11**.

5.6 Staging and Timing of Proposal

The future timing of the proposed development is dependent upon successful resolution of outstanding issues including the environmental and planning approvals process including rezoning of the proposed development footprint which will be retained in one title in perpetuity. Construction of the proposed aged care facility will be constructed over two principal stages: construction of the day care facility and administration block followed by the construction of the independent and supported accommodation living units. Construction is anticipated to commence in 2014 subject to all necessary regulatory approvals being obtained.

6. EXISTING ENVIRONMENT

6.1 Studies and Surveys Used

In addition to accessing published information that is available in the public domain, the following environmental investigations undertaken on-site have been used to describe the existing environment at the site:

- **ATA Environmental (2005).** *Flora and Vegetation Survey, Armstrong Reserve, Dunsborough.* Unpublished Report No. 2005/208 (Version 1). Prepared for Ray Village Aged Services (Inc.).
- **ATA Environmental (2006).** *Fauna Assessment, Armstrong Reserve, Dunsborough.* Unpublished Report No. 2005/176. Prepared for Ray Village Aged Services (Inc.), April 2006.
- **ATA Environmental (2007).** *Regional Western Ringtail Possum Assessment, Armstrong Reserve, Dunsborough.* Unpublished Report No. 2007/088. Prepared for Ray Village Aged Services (Inc.), October 2007.
- **Coffey Environments Pty Ltd (2008).** *Flora and Vegetation Survey, Armstrong Reserve, Dunsborough.* Unpublished Report No. 2005/208. Prepared for Ray Village Aged Services (Inc.), March 2008.
- **Ecoscape (Australia) Pty Ltd (2010).** *Armstrong Reserve, Dunsborough – Environmental Advice.* Unpublished Report No. 6678-2279-09R prepared for Ray Village Aged Services (Inc.), July 2010.
- **Coffey Environments Pty Ltd (2012).** *Stage 1 Preliminary Site Investigation (PSI) (Non-Intrusive) – Armstrong Reserve, Naturaliste Terrace, Dunsborough, WA.* Report No. EP2012/005, V2 prepared for Ray Village Aged Services (Inc.) t/as Capecare, January 2012.
- **Ecoscape (Australia) Pty Ltd (2012).** *Armstrong Reserve Level 2 Fauna Survey.* Unpublished Report No. 7925-2582-11R prepared for Ray Village Aged Services (Inc.), May 2012.

6.2 Site Description

The following site description has been adapted from information contained within the Preliminary Site Investigation (PSI) report prepared for the site and has been based on a site inspection undertaken in November 2011 (Coffey Environments, 2012).

Lot 111

- The lot houses a large tin shed approximately 25m long by 15m wide by 6m high. The shed contains a caravan belonging to the City of Busselton, as well as miscellaneous materials including PVC pipes and broken bricks which are not of environmental concern. The flooring within the shed is comprised of sealed concrete with no visual or olfactory evidence of potential spill and a sign on the side of the shed reading “Flammable Liquid”, as well as another sign on the inside of the shed reading “No Smoking” indicating that storage of chemicals may have, at some time, occurred.
- The drainage system from the shed consists of drainage pipes flowing into small sand basins covered with metal grills as well as a PVC pipe running into the drainage line located on Lot 258.

- The south-western corner of the lot contains a sealed asphalt driveway in reasonable condition, while the remainder of the lot is primarily unsealed, compacted sand. The exceptions to this include a square concrete slab roughly 4m by 4m located approximately 10 m northeast of the large grey shed, a concrete bund containing a small amount of asphalt located at the north-eastern edge of the lot, as well as a concrete ramp directly adjacent to the bund which looked to be for the purpose of servicing vehicles. It was noted that the ramp structure consisted of a pit in the centre containing unsealed ground.
- Cyclone fencing (approximately 2 m high) extends around the boundary of the lot.
- Stacks of bricks were observed on the western side of the grey shed while a steel trailer (approximately 2m by 3m) and a stack of PVC piping are found on the northern side of the shed. Other miscellaneous items are situated in the north-eastern corner of the lot.

Lot 115

- Lot 115 contains the Country Women's Association Hall and rest room ("CWA hall"). Some of the walls and in particular the roof could potentially be constructed from asbestos containing material (ACM).
- A small, degraded wire fence approximately 1 m high encompasses the perimeter of the CWA hall.
- A round concrete pad with a diameter of approximately 4 m is located directly west of the CWA hall.

Lot 116

- Located at the Naturaliste Terrace entrance to the site, the lot contains a sealed asphalt driveway which runs onto the adjoining Lot 111.
- A lime green coloured tin shed (approximately 15 m long by 5 m wide by 6 m high) is located on the southeastern corner of the lot.
- A variety of materials surround the green shed including a car tyre, a car battery, an empty 20L plastic drum (unlabelled, consistent with a water drum), a traffic sign and some PVC pipe.

Lot 117

- Approximately 70% of the lot is vegetated, with the remaining area occupied by an unsealed driveway.
- The unsealed driveway contains a pile of 'blue metal' gravel (approximately 40 m^3).

Lot 257

- Approximately 85% of the lot is vegetated, interrupted by a cleared area located in the southern portion below the drainage line located on Lot 258.
- The vegetated area is intersected by a network of informal tracks and firebreaks.
- The cleared region located on the southern half of the lot is surrounded by cyclone fencing approximately 2 m high and is used as a storage area as part of the Depot for various building materials including bricks, precast concrete drainage pipes and rings, pieces of timber, steel frameworks and grates. A number of large piles of sand totalling approximately 500m^3 are stored in this area.

Lot 258

- The lot comprises a narrow 2 m wide waterway, believed to be part of the engineered drainage line for urban stormwater management and is located on the lot just north of the grey shed that is located on Lot 111.
- Further east, the drainage line was seen to expand into a larger, swamp-like water body densely populated with rushes before continuing through to the eastern-most boundary of the lot adjacent to Gifford Road.

Table 10 identifies the total area of each of the lots, as well as the area of each lot that is currently vegetated and cleared.

TABLE 10
EXISTING VEGETATED AND CLEARED AREAS WITHIN THE SITE

CURRENT LANDUSE	RESERVE No.	LOT No.	TOTAL AREA (~m^2)	EXISTING CLEARED AREA (~m^2)
Armstrong Reserve (north of Drainage Reserve)	R25229	257	17447.20	0.00
Armstrong Reserve (south of Drainage Reserve)	R25229	257	17619.50	2348.50
Drainage Reserve	R40445	258	2174.80	0.00
Shire Works Depot	R36468	117	1988.10	216.80
		111	978.0	745.20
SES Depot	R34732	116	1006.50	710.60
CWA site	-	115	989.60	311.50
		TOTAL	**42203.7**	**4332.60**

6.3 Climate

The Dunsborough area experiences a Mediterranean climate with warm, dry summers and cool, wet winters. High-pressure cells dominate climatic patterns during summer and the passage of cold fronts and associated low-pressure cells dominate during winter. Strong sea breezes dominate during late November to early March. As shown on **Chart 2** the mean maximum temperature generally occurs in February and ranges from 26.5°C in February to 16.7°C in July, while the mean minimum temperature ranges from 10.1°C in August to 16.5°C in February.

Rainfall averages collected between 1903 and 2011 at the Bureau of Meteorology's Cape Naturaliste weather station (Station No. 009519) show an annual mean rainfall of 812.6 mm. Rainfall distribution is shown on **Chart 2** and it can be see that approximately 60% of the annual rainfall is received between May and September (Bureau of Meteorology, 2011).

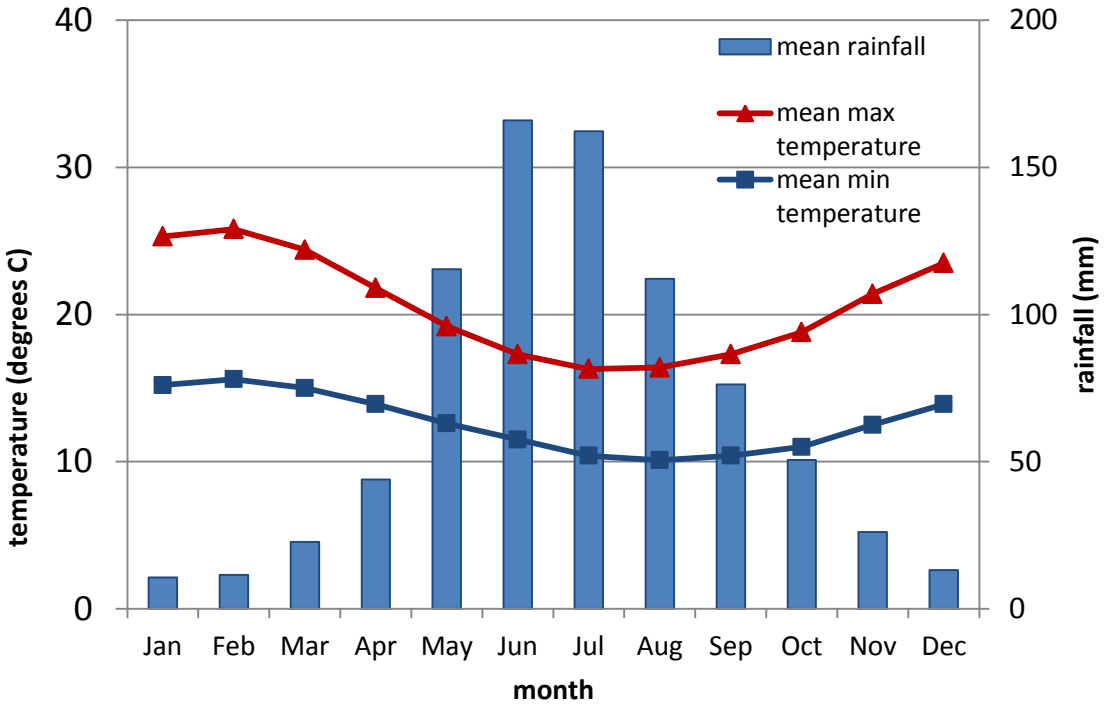

CHART 2: Mean monthly rainfall and mean maximum/minimum temperature data for Cape Naturaliste Weather Station (1903 - 2011) (Source: Ecoscape, 2012)

6.4 Topography and Landforms

The site overlies the extreme south-western extent of the Swan Coastal Plain and is relatively flat and low-lying (below 10m AHD), forming part of the Pleistocene Alluvial Plain. The site also lies on the border of the Leeuwin Block, which is comprised of intensely deformed plutonic rocks consisting of mainly granite and gneiss (Elscot, 2004).

In terms of landforms, the site is associated with the Abba Plains land system and the Abba Flats (A) land unit which is characterised by flats and low rises with sandy grey-brown duplex (Abba) and gradational (Busselton) soils (Tille and Lantzke, 1990).

6.5 Geology

The geology of the site is identified and described in the Yallingup Sheet of the *Environmental Geology Map Series* (Leonard, 1991). The map unit identified is Sm_2 which is represented predominantly by soils consisting of silty sands and are characterised by brown to yellow-grey, fine-medium grained quartz sand with variable silt content over Guilford formation at varying depths (Leonard, 1991) and are typically waterlogged during winter (Churchward & McArthur, 1978).

6.6 Soils

6.6.1 Acid Sulfate Soils

Acid sulfate soils (ASS) are naturally occurring soils containing iron sulfides which, when exposed to atmospheric oxygen in the presence of water, form sulfuric acid. They are most likely to form in protected low energy environments such as barrier estuaries and coastal lakes and commonly occur in low-lying coastal lands such as Holocene marine muds and sands and can also be associated with dryland salinity in some inland agricultural areas (Department of Environment, 2004).

These soils do not pose a significant risk to human health or the environment when left undisturbed. However when disturbed such as by drainage, dewatering or soil excavation, these soils are prone to produce sulfuric acid and mobilise iron, aluminium, manganese and other heavy metals. The WAPC (2009) identifies that the release of these reaction products can result in:

- Wetlands degradation;
- Localised reduction in habitat and biodiversity;
- Deterioration of surface and groundwater quality;
- Loss of groundwater for irrigation;
- Increased health risks associated with arsenic and heavy metals contamination in surface and groundwater, and acid dust;
- Risk of long-term infrastructure damage through corrosion of sub-surface pipes and foundations by acid water; and
- Invasion by acid tolerant water plants and dominance of acid tolerant plankton species causing loss of biodiversity.

The presence of ASS has been a recognised issue of concern in Western Australia since 2003. Both the DEC and the Western Australian Planning Commission (WAPC) have released guidance notes on ASS, covering the requirement for assessing sites and the management of sites where ASS are identified (Department of Environment and Conservation, 2009; Western Australian Planning Commission, 2009). ASS investigations are commonly required as part of the conditions of subdivision or as a requirement for a dewatering license application.

Electronic access to current ASS mapping is located on Landgate's SLIP portal (https://www2.landgate.wa.gov.au/bmvf/app/waatlas/). The mapping is provided as a guide to the potential location of acid sulfate soil layers occurring at different depths in the areas of coverage. The maps have been prepared on the basis of geological origin, depth to groundwater and partial 'ground-truthing' of verifiable data (Western Australian Planning Commission, 2009).

The Landgate mapping identifies the site as having 'Moderate to Low Risk of ASS' occurring within 3m of natural soil surface or deeper.

6.6.2 Contaminated Soils

The *Contaminated Sites Act 2003* provides for the identification, recording, management and remediation of contaminated sites in Western Australia, and imposes wide-ranging reporting obligations by requiring that the following people make initial reports of known or suspected contaminated sites to the DEC:

- Any person who knows or suspects they have (at any time in the past) caused or contributed to contamination on a site (even if they no longer own or occupy the site) owners (including mortgagees in possession) who know or suspect contamination of their site;
- Occupiers of (or people in control of) sites which they know or suspect are contaminated; and
- Auditors engaged to report on the site in accordance with the *Contaminated Sites Act 2003.*

A Shire Works Depot currently occupies Lots 111 and 117. While the Depot is not currently heavily used, the risk of soil contamination either occurring or having previously occurred appears to be low but cannot be discounted. Soil contaminants generated by the activities associated with Shire Depots may include pesticides, heavy metals, and/or hydrocarbons, among other parameters.

In accordance with the DEC Contaminated Sites Management Series, specifically Department of Environmental Protection (2001) *Reporting of Site Assessments*, a Preliminary Site Investigation (non-intrusive) (PSI) was undertaken during which the following issues were assessed:

- General environmental practices of the occupiers of the facility in relation to any chemical handling and storage, wastewater discharges, waste management and general environmental management practices;
- General environmental status of the site;
- Identification of potential contaminant sources on the property;
- The potential for contaminated soil and groundwater to exist at the site;
- Surrounding land use adjacent to the property; and
- The potential for migration of contaminants from/to neighbouring properties or off-site environmental receptors.

Key tasks that were undertaken as part of the assessment process included the following:

- Identification of:
  - Site details (including street address, lot number, Certificate of Title, local government authority, zoning);
  - Proposed landuse(s) for the site;
  - Surrounding current and historical landuses and zoning;
  - The environmental value of the site and surrounding environment (land, surface waters, groundwater, air), including review of nearby registered groundwater bores
  - Site conditions, including topography, geology, hydrogeology and drainage conditions, site layout, location of infrastructure, location and description of any imported fill;

- Detailed site walkover to validate anecdotal evidence and desktop information, and to identify any additional evidence of potential contamination (eg fuel storage, building materials, imported fill, waste storage) and contaminant pathways (eg service trenches, stormwater drainage, tunnels and shafts, and natural holes or fractures);
- To the extent possible, Interviews with current and past site users and adjacent land users to address any uncertainties;
- As per the DEP (2001) *Reporting of Site Assessments*, prepare a detailed report that documents the above information together with interpretations, conclusions and recommendations; and
- Appending of all external search documentation together with site photographs and figures.

As the site is not the legal responsibility of the Proponent, no intrusive sampling was undertaken during the PSI as it would require in some instances, drilling through concrete flooring and collecting samples of wall and roof material of buildings that are still in use.

On the basis of the PSI three areas of environmental concern (AEC) were identified:

1) Concrete ramp possibly used for servicing vehicles in Lot 111. A lack of definitive information regarding the use of this ramp makes it difficult to rule out the possibility it was utilised to service vehicles. From the site walkover it is also noted that a pit within the ramp appeared to be open ground which would typically warrant some level of intrusive investigation to confirm or otherwise the absence of chemicals associated with fuel, oil, degreasers or similar in the subsurface.
2) Large grey shed that potentially housed flammable liquids inferred by a 'Flammable Liquid' sign and a 'No Smoking 'sign within the shed (Lot 111). This signage suggests some flammable materials, such as fuels and other chemicals could have been stored on-site historically which would typically warrant some level of intrusive investigation.
3) Drainage line northwest of grey shed where a surface sheen was observed on the surface of the water at the time of the site walkover (Lot 111). The sheen may be associated with iron flocculation since it did not exhibit any ambient odours as would be expected if the sheen was associated with fuel, oils or similar. As the sheen was present close to the upstream boundary of the site, it is possible that its presence is associated with urban stormwater run-off from nearby roads and properties.

A conceptual site model (CSM) was prepared based on the findings of the PSI and describes the possible pathways by which exposure to potential contamination may occur. This will be revised as more detailed information for the site becomes available during the implementation of a Detailed Site Investigation (DSI) and the nature of the contamination and the issues arising are better understood.

For exposure to occur, a complete pathway must exist between the source of contamination and the receptor (i.e. the person or ecosystem components potentially affected by the contamination). Where the exposure pathway is incomplete, exposure cannot occur, leaving no risk via that pathway.

An exposure pathway will typically consist of the following elements:

- A source of contamination (e.g. a leak or spill);

- A release mechanism (e.g. migration in soil, leaching to water, emission to air);
- Retention in the transport medium (e.g. soil, groundwater, surface water or air);
- An exposure point (e.g. where a person comes into contact with contaminated dust or soil, or contaminated groundwater from a well, or in a building overlying volatile contamination); and
- An exposure route (e.g. inhalation, ingestion, absorption through the skin).

While several AECs were identified during the PSI, sources of potential contamination were not definitive enough to conceptualise possible exposure pathways. Therefore the CSM is presented as a site conceptualisation aid rather than an exposure pathway model. An exposure pathway model will be developed as part of the proposed Detailed Site Investigation (DSI) that is discussed in detail in **section 7.3.5**.

The PSI report (Coffey Environments Pty Ltd, 2012) is included as **Appendix 2**.

6.7 Coastline

The site is located approximately 200 m on the landward side of the primary dune system associated with Geographe Bay. Gifford Road and existing residential development are located between the beach and primary dune system and the site (refer to **Figure 2**).

6.8 Hydrogeology

6.8.1 Superficial Formation

The Dunsborough Fault defines the western margin of the Southern Perth Basin and the eastern margin of the Leeuwin Block transecting the Dunsborough and Quindalup townsites (**Figure 1**). The Busselton Fault subdivides the Southern Perth Basin into the Bunbury Trough to the east and the Vasse Shelf to the west that in itself is further subdivided into the Wirring Fault (Department of Water 2008).

The superficial deposits of the Vasse Shelf comprise Tertiary and Quaternary sediments, with a thickness of up to 15 m, sit unconformably over the Leederville Formation (Department of Water, 2008).

6.8.2 Leederville Formation

The Leederville Formation is the major confined aquifer in the Perth Basin extending from Ledge Point in the north to Augusta in the south and reaching a maximum thickness of approximately 650m.

The Leederville Formation is an interbedded, multilayered aquifer consisting of fine-to-medium grained quartz sandstone ranging in thickness on the Vasse Shelf from approximately 50 m to 250 m. The Formation overlies the Sue Coal Measures to the west of the Wirring Fault and the Cockleshell Gully Formation to the east (Department of Water, 2008).

Discharge from the aquifer generally occurs near the coast into creeklines and swamps over an area extending several kilometres.

6.8.3 Sue Coal Measures

The Sue Coal Measures consist of multi-coloured shale, moderately consolidated fine to coarse-grained quartz sandstone and accessory feldspars, pyrite and carbonaceous materials, with discharge occurring to the Leederville aquifer through upward leakage, and recharge occurring by downward leakage from sandier areas higher up in the flow path (Department of Water, 2008).

The drinking water supply for the towns of Dunsborough, Yallingup and Quindalup is derived from nine Water Corporation production bores comprising the Quindalup Water Reserve, situated approximately 7 km south-east of Dunsborough. The production bores draw principally from the Leederville (confined) aquifer and also from the Sue Coal Measures (Department of Water, 2008).

6.9 Hydrology

6.9.1 Groundwater

The inferred direction of groundwater flow under the site is east towards Dunn Bay, Southern Geographe Bay approximately 300m east of the site (Coffey Environments, 2012).

There are no groundwater monitoring bores located on-site, and no long-term DoW monitoring bores within close proximity to the site.

The Department of Water (DoW) Water Information Network (WIN) database indicates that there are three registered groundwater bores within a 1 km radius of the site (20006571, 20006572 and 23043142). These wells are located approximately 200 m north (20006571), 200 m northwest (20006572) and 100 m northeast (23043142) of the site.

None of these bores have long-term groundwater level monitoring data. According to DoW WIN data, water levels ranged from 1.300 mAHD (well 20006572, recorded in 1977) to 2.440 mAHD (wells 20006571 and 20006572, recorded in 1948). No more recent information is available (Coffey Environments, 2012).

Coffey Environments (2012) inferred that surface water encountered in the drainage line located on Lot 258 may be indicative of local groundwater levels. It is estimated that this level was approximately 1-2 mbgs which is consistent with the DoW WIN data (refer to Appendix E of Coffey Environments, 2012).

Groundwater quality within the area is classified as Freshwater (<1,000mg/L) (Coffey Environments, 2012).

The site is not located within a Groundwater Protection Zone.

6.9.2 Groundwater

The regional surface drainage of the area forms part of the Geographe Catchment which drains into Geographe Bay.

A dominant physical feature of the site is an area set aside for drainage purposes on Lot 258 (R40445) bisecting the central portion of the site. This area connects a naturally occurring drainage line whose origin is to the west of Cape Naturaliste Road and flows through Marri and Armstrong Reserves where it connects with underground stormwater pipe network located within the Gifford Road road reserve. Much of the drainage line as it appears on site has historically been subjected to engineering works including channelization to ensure that its stormwater capacity is maintained to prevent flooding to surrounding residential areas.

The extent of the catchment area upstream of the site contributing flow to this drain is estimated to be approximate 101 ha, with the main watercourse extending 1.7km west of the site. Approximately 70% of the catchment upstream of the site has been cleared for agricultural use.

Estimates of existing flow from this catchment based using the Rational Method and Index Flood Method detailed in Australian Rainfall and Runoff (Institution of Engineers Australia, 2000) are 0.6 m^3/s and 1.3 m^3/s for the 5 year and 100 year average recurrence interval (ARI) storm events respectively (Sasha Martens, Hyd2o, 10 June 2012, pers. comm.).

6.9.3 Wetlands

Wetlands in Western Australia are categorised by the DEC as Conservation, Resource Enhancement or Multiple-use wetlands depending upon their conservation values (Hill *et al.,* 1996). This categorisation also takes into account wetlands recognised as being nationally significant identified in *A Directory of Important Wetlands in Australia,* and internationally significant through the Ramsar Convention.

The EPA has recognised that a number of lakes (wetlands) on the Swan Coastal Plain be afforded protection under the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (http://www.epa.wa.gov.au/Policies_guidelines/envprotecpol/Pages/1090_EnvironmentalProtectionSwanCoastalPlainLakes.aspx).

No wetlands are mapped as occurring on-site according to either the Wetland Atlas mapping of Hill *et al*. (1996) or the DEC's *Swan Coastal Plains Wetlands Geomorphic dataset* as depicted on the *WA Atlas* (https://www2.landgate.wa.gov.au/bmvf/app/waatlas/). The nearest mapped *Geomorphic Wetlands* dataset wetland, Toby's Inlet (Estuary Peripheral Conservation Category Wetland), is located approximately 2.8 km to the southeast of the site. There are no wetlands mapped as occurring on-site that are identified as being nationally or internationally significant or protected under the EPA's EPP policy.

In 2008, the DEC (South West Regional Office) mapped an area of the site as a wetland describing the vegetation as consisting entirely of *Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area, which subsequently has been listed nominated as a Priority 1 Ecological Community (Webb, 2008a). **Figure 7** identifies the DEC mapped wetland.

The plant community contained within the wetland is thought to be dependent upon seasonal freshwater subsoil moisture for survival and that this water is delivered to the community by subsurface flow from the groundwater seepage feature found within Marri Reserve to the west of the site. It is important to note, that a dominant physical feature of the site is an area set aside for drainage purposes on Lot 258 (R40445) bisecting the central portion of the site. This area connects a naturally occurring drainage line whose origin is to the west of Cape Naturaliste Road and flows through Marri and Armstrong Reserves where it connects with underground stormwater pipe network located within the Gifford Road road reserve. Much of the drainage line as it appears on site has historically been subjected to engineering works including channelization to ensure that its stormwater capacity is maintained to prevent flooding to surrounding residential areas. The wetland mapped as wetland by the DEC includes this reserve.

As previously discussed in **Section 6.9.2** the area set aside for drainage purposes on Lot 258 (R40445) which bisects the central portion of the site connects a naturally occurring drainage line whose origin is to the west of Cape Naturaliste Road and flows through Marri and Armstrong Reserves to the stormwater pipe network located within the Gifford Road road reserve. The area mapped as wetland by the DEC (Webb, 2009a) includes this reserve.

Ecoscape conducted a Level 2 flora and vegetation assessment of the site in 2009 and their boundary determination of the PEC, also shown on **Figure 7**, is based on the extent of the dampland and mid-slope vegetation found on-site, contending that this area includes the definitive species of *Melaleuca rhaphiophylla, Banksia littoralis* and *Eucalyptus rudis*, with the other definitive species being widespread throughout the entire reserve.

The mapping by Ecoscape (2010) of the nominated PEC boundary shown on **Figure 7** is similar to the DEC's interpretation discussed during a site visit held with the DEC and OEPA on the 23 October 2009 and indicated in Webb (2008b). Ecoscape's interpretation of the nominated PEC boundary occupies a smaller extent than the DEC's wetland boundary mapping (Webb, 2009a) which includes a larger area near the south-western corner, a section north of the Shire Depot near the centre of the reserve, and all of the northern edge.

6.10 Flora and Vegetation

6.10.1 Background

The site comprises 4.22 ha of which approximately 3.76 ha is covered with remnant vegetation.

Several flora and vegetation surveys have been undertaken on the site as follows:

- ***ATA Environmental (October 2005)*** – This initial Level 2 flora and vegetation survey provided list of flora on the site and described and mapped four different vegetation types. Sampling included 10m x 10m quadrats.

- ***ATA Environmental (October 2006)*** – This was a follow-up to the 2005 survey and included sampling from additional quadrats as well as refinement of the vegetation map.

- ***Coffey Environments (2007)*** – Additional spring surveying to verify or more accurately determine the Floristic Community Types (FCT) identified during the initial 2005 survey, in particular to define whether any Threatened Ecological Communities (TECs) occur on site, with a reasonable level of confidence.

- ***Ecoscape (October and November 2009)*** – This survey included a targeted conservation significant flora survey of the site on October 30 and a quadrat based survey of the site as well as nearby Marri Reserve and Peron Reserve. A computer analysis of the quadrat data was undertaken to test the similarity of the vegetation and identity of Floristic Community Types (FCTs).

The Ecoscape (2010) report is included as **Appendix 3**.

6.10.2 Vegetation

6.10.2.1 Vegetation Complex

ATA Environmental (2007) considered that the vegetation on the site contained elements of both the Abba (AB) and Wilyabrup (Wr) Vegetation Complexes (Mattiske and Havel, 1998). The vegetation has more in common with the Abba Complex (open forest and woodland of Marri (*Corymbia calophylla*) on flats and low rises in the humid zone) than the Wilyabrup Complex (woodland of *Corymbia calophylla-Eucalyptus marginata* subsp. *marginata* with closed heath of Myrtaceae-Proteaceae-Papilionaceae spp.) due to the absence of Jarrah on the site and an understorey with few Myrtaceae-Proteaceae-Papilionaceae species.

Using the Beard vegetation mapping system the vegetation on the site is associated with Beard Association 973 (Low forest; paperbark *Melaleuca rhaphiophylla*) and 1000 (Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree *Melaleuca* spp.) (Coffey Environments, 2008).

6.10.2.2 Vegetation Types

The Ecoscape (2010) vegetation type descriptions and maps have been used for this PER rather than those contained in the initial ATA Environmental/Coffey surveys as the Ecoscape report also includes a comparison of the vegetation on the site with two other reserves located nearby. The ATA Environmental/Coffey vegetation descriptions of the site alone do not allow this comparison.

According to Ecoscape (2010) the site contains three distinct vegetation types as follows:

1. **CcAfMxOF** - *Corymbia calophylla, Agonis flexuosa* and mixed species Open Forest to Low Woodland occasionally over *Jacksonia furcellata* Tall Open Shrubland occasionally over *Acacia divergens, Acacia pulchella* and *Daviesia divaricata* Open Heath over *Xanthorrhoea preissii, Hibbertia hypericoides* and mixed species Open Low Heath to Low Shrubland over mixed Open Herbland and mixed Open to Very Open Sedgeland.

   This vegetation type occurs on dryland soils in a thin strip along the northern boundary as well as in the south-west corner of the site.

2. **AfCcErBlLOF** - *Agonis flexuosa* (Peppermint), *Corymbia calophylla* (Marri), *Eucalyptus rudis* (Flooded Gum) and *Banksia littoralis* (Swamp Banksia) Low Open Forest to Open Woodland over *Hakea varia, Jacksonia furcellata* and *Viminaria juncea* Tall Open Shrubland over Mixed Open Shrubland over *Hibbertia hypericoides* and *Xanthorrhoea* spp. Low Open Shrubland over *Mesomalaena tetragona* and mixed species Sedgeland over *Caesia micrantha* and *Conostylis aculeata* Very Open Herbland.

   This vegetation type occurs at the transition from dryland to wetland soils in a thin strip near the northern boundary as well as in the south-east corner of the site.

3. **MrErAfLOF** - *Melaleuca rhaphiophylla, Eucalyptus rudis, Agonis flexuosa* Low Open Forest or Woodland over *Viminaria juncea, Hakea varia* Tall Open Shrubland over *Xanthorrhoea preissii* Low Open Shrubland to Low Open Heath over *Lepidosperma squamatum, Cyathochaeta avenacea, Tetraria capillaris* and mixed species Sedgeland.

   This vegetation type occurs on waterlogged (dampland) soils in the centre of the site extending from Naturaliste Terrace to Gifford Road.

Ecoscape's (2010) vegetation mapping and quadrat locations are shown on **Figure 7**.

6.10.2.3 Floristic Community Types

The quadrat data collected during the Ecoscape (2010) survey were subject to computer analysis (PATN computer programme) to assist in determining which of the Gibson *et al*. (1994) Floristic Community Types (FCT) of the Southern Swan Coastal Plain the vegetation on the site belonged to.

The PATN analysis performed by EA Griffin & Associates (2010) combined the quadrat data from three sites in Dunsborough including Armstrong Reserve with a much larger dataset for the southern Swan Coastal Plain. The computer analysis recognised two different vegetation communities on the site. The analysis grouped the dryland and mid-slope, or transitional, quadrats as one vegetation community and the dampland quadrats as a separate community. A second computer analysis of the quadrat data using the PATN programme by Ecoscape but using only the data from the three reserves in Dunsborough (Armstrong, Marri and Peron) resulted in the three different vegetation types listed above (dryland, transitional and dampland) being separate vegetation communities.

The EA Griffin & Associates' analysis concluded that the vegetation on the site does not match the Gibson *et al.* (1994) Floristic Community Types well. While the data had some similarity with several FCTs it was concluded that the three Dunsborough reserves may contain vegetation that was not sampled in the Gibson *et al.* (1994) survey and as such may represent a different FCT or FCTs.

The EA Griffin & Associates (2010) report is included as Appendix 8 in Ecoscape's (2010) report (refer to **Appendix 3)**.

6.10.2.4 Vegetation Condition

The condition of the vegetation in all the quadrats surveyed by Ecoscape (2010) was considered to be Very Good to Excellent according to the Keighery (1994) condition scale. Some deaths of Banksia trees in one spot near the southern part of the site (near quadrat 901) indicated the potential presence of Dieback (*Phytophthora cinnamomi*) on the site.

ATA Environmental (2007) mapped the condition of the whole site and also considered that most of the vegetation was in Very Good to Excellent condition. ATA Environmental mapped the vegetation in the north-east corner as slightly lower with a Very Good to Good condition.

6.10.2.5 Conservation Significant Vegetation

Vegetation Complex
At the Vegetation Complex level the Abba Complex has 6% (3198 ha) of its original extent remaining on the Swan Coastal Plain of which only 0.1% (77 ha) is in secure reserves (Environmental Protection Authority, 2006b). A level of retention below 10% defines the vegetation complex as 'endangered'. At the Beard Vegetation Association level vegetation association 973 has nearly 40% of its original extent remaining while approximately 29% of vegetation association 1000 remains.

Floristic Community Type
The computer analysis results indicated that the vegetation on the site does not closely match any known FCTs. This was inferred to be a result of the vegetation on the site being different to known FCTs rather than a result of poor data or site conditions such as an abundance of weeds. As a result, it is not possible to assess the conservation significance of the vegetation using the Gibson *et al.* (1994) FCTs.

The DEC (Webb, 2009a and 2009b) has mapped and described the mid-slope and dampland vegetation on the site as the following nominated Priority 1 Ecological Community:

"Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area" (Webb *et al.* 2009).

As the vegetation type was described using the vegetation on the site, it follows that it must occur on the site. Based on extensive quadrat surveying conducted during Spring 2009, Ecoscape (2010) concluded that the dampland and mid-slope vegetation on the site meet the description of this vegetation type but not the area of dryland vegetation that they mapped. Ecoscape mapping of the nominated PEC on the site is shown on **Figure 8**. The total area of the nominated PEC occurring within the proposed development footprint as mapped by Ecoscape is 1162 m^2.

The area mapped by the DEC as representing the nominated PEC on the site is also shown on **Figure 7**. Defining the boundaries of the PEC by the DEC was based on one quadrat that was surveyed out of season (i.e. not in Spring). The total area of the PEC occurring on-site is 3.21 ha while the area of PEC within the proposed development footprint as mapped by the DEC is 4352 m^2. This latter area includes the area mapped by Ecoscape (2010) and based on multiple quadrats surveyed during Spring as dryland vegetation.

Priority 1 Ecological Communities are "Poorly-known ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. Priority 1 Ecological Communities may include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range" (DEC, 2010b).

Ecoscape (2010) assessed the similarity of the vegetation on the site with vegetation in nearby Marri and Peron Reserves in Dunsborough. Using computer analysis of quadrat data Ecoscape (2010) concluded that the upland vegetation on the site is similar to the upland vegetation on Marri Reserve. The mid-slope and dampland vegetation on the site was not similar to any vegetation types on Marri and Peron Reserves. This finding concurs with the DEC understanding that the *Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay vegetation community is only known to occur on the Armstrong Reserve site. Ecoscape (2010) consider that this vegetation type may occur on private land elsewhere on the Abba Plain but due to the lack of regional data/information being readily available, further surveys would be required to determine this. Private land was not included in the Ecoscape (2010) assessment as access to sites was denied by the landowners.

6.10.3 Flora

6.10.3.1 Total Flora

Ecoscape (2010) recorded a total of 148 species in their 2009 survey of the site. This included 135 native and 13 introduced species. ATA Environmental/Coffey Environments recorded a higher number in their three surveys of the site with a total of 171 species comprising 148 native and 23 introduced. Both surveys recorded a low percentage of introduced species with 8.8% and 13.4% for the Ecoscape and ATA Environmental/Coffey Environments surveys, respectively.

6.10.3.2 Conservation Significant Flora

No Threatened (Declared Rare) flora species have been recorded on the site in any of the surveys.

One Priority 4 listed species *Eucalyptus rudis* subsp. *cratyantha* occurs on the site. This species is a subspecies of the common Flooded Gum and extends from the Mandurah-Pinjarra area south to Cape Naturaliste. Priority 4 species are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

Twenty individual trees of this subspecies were mapped by Ecoscape (2010) scattered throughout the northern half of the site in dampland and transitional soil types. Two of these individuals are found within the proposed development footprint.

Locations of the 20 individual trees are shown on **Figure 7**.

Webb *et al.* (2009) identified nine species within Armstrong Reserve that were considered by them to be significant taxa on the Busselton Plain. None of the species that were recorded from Armstrong Reserve have conservation significance (ie none are DRF or Priority Listed Flora) but have other forms of significance. The nine species and their stated significance were:

- *Baumea rubiginosa*, - only extant population on the Swan Coastal Plain is believed to be on Armstrong Reserve
- *Lomandra pauciflora*, - usually found in the Jarrah and Karri forests and has only few populations on the Swan Coastal Plain
- *Anigozanthos flavidus*, - listed as a wetland species but has no additional reason for listing as a significant taxa in Webb *et al.*(2009)
- *Orthrosanthus laxus*, - poorly collected on the Swan Coastal Plain
- *Caladenia brownii*, - usually found in Karri forest
- *Amphibromus nervosus*, - described as indicative of claypans on the Pinjarra Plain
- *Acacia divergens*,- described as a wetland species with disjunct populations on the Swan Coastal Plain
- *Daviesia divaricata*, - known from disjunct populations on the Swan Coastal Plain
- *Kennedia coccinea*, - described as uncommon on the Swan Coastal Plain.

6.11 Terrestrial Fauna

6.11.1 Level 1 Survey

In 2005 a Level 1 fauna assessment of the site was undertaken by ATA Environmental (2006) to comply with the EPA's *Guidance for the Assessment of Environmental Factors No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (2004b) and *Terrestrial Biological Surveys as an Element of Biodiversity Protection Position Statement No. 3* (2002).

A desktop survey of *Faunabase*, previous surveys within the region and the on-site reconnaissance survey identified that 11 species of amphibian, 36 species of reptile, 32 species of mammals (10 introduced or feral), and 153 species of avifauna may potentially occur within the region (ATA Environmental, 2006).

Scheduled species that are known to occur in the region in habitats similar to those present on site include:

- Schedule 1 (rare or likely to become extinct):
  - Chuditch (*Dasyurus geoffroii*) classified as Vulnerable;
  - Western Ringtail Possum (*Pseudocheirus occidentalis*) classified as Vulnerable;
  - Carnaby's Cockatoo (*Calyptorynchus latirostris*) classified as Endangered;
  - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*);
  - Dunsborough Burrowing Crayfish (*Engaewa reducta*); and
  - Baudin's Cockatoo (*Calyptorynchus baudinii*) classified as Vulnerable.
- Schedule 4 (in need of special protection):

  - Peregrine Falcon (*Falco peregrinus*); and
  - Carpet Python (*Morelia spilota imbricata*).
- Priority 2:
  - Barking Owl (*Ninox connivens connivens*).
- Priority 3:
  - Southern Brush-tailed Phascogale (*Phascogale tapoatafa tapoatafa*); and
  - Masked Owl (*Tyto novaehollandiae novaehollandiae*).
- Priority 4:
  - Western False Pipistrelle (*Falsistrellus mackenziei*);
  - Water Rat (*Hydromys chrysogaster*); and
  - Western Brush Wallaby (*Macropus irma*).
- Priority 5:
  - Quenda; South Brown Bandicoot (*Isoodon obesulus fusciventer*).

The assessment included a reconnaissance survey by suitably qualified personnel to undertake selective, low intensity sampling of the fauna and faunal assemblages in order to verify the accuracy of the desktop assessment and to further delineate and characterise the fauna and faunal assemblages present within the site (ATA Environmental, 2006).

A targeted survey for Western Ringtail Possum was carried out on-site on the 5 – 8 September and on the 5 and 7 October 2005. Between 19 and 21 Western Ringtail Possum were identified as actively utilising the site during the survey period (ATA Environmental, 2006).

The Level 1 fauna assessment report (ATA Environmental, 2006) is included as **Appendix 4**.

6.11.2 Level 2 Survey

In 2011, a Level 2 fauna survey was undertaken in order to provide sufficient information to determine the faunal values of the site, to describe and map the different fauna habitats of the site, and to provide an inventory of all invertebrate species known or likely to occur in habitats present on-site, based on information obtained during the habitat description as well as compilation from appropriate literature records or other database sources (Ecoscape, 2012).

6.11.2.1 Desktop Assessment

Prior to undertaking a reconnaissance survey, a desktop assessment of the site identifying significant fauna issues considered both published and unpublished information. A search was conducted of a number of State and Commonwealth databases. A search of the databases was undertaken to develop a list of potential birds, reptiles, mammals and amphibians likely to inhabit the site (Ecoscape, 2012).

The following sources were accessed as part of the desktop review:

- *Western Australian Wildlife Conservation Act (1950)*
- DEC databases and resources:
  - Threatened Fauna databases
  - Nature Map
  - List of Threatened and Priority Fauna
- *Commonwealth Environment Protection and Biodiversity Conservation Act (1999)* resources:

  - Threatened Fauna databases
  - Protected Matters Search Tool
  - List of Threatened Fauna
- Birds Australia's Atlas II database
- Review of previous reports and surveys for the area

A list of targeted fauna species was also compiled using species identified through the:

- *Western Australian Wildlife Conservation Act (1950)*
- *Commonwealth Environment Protection and Biodiversity Conservation Act (1999)*
- DEC Priority fauna species list

Threatened and Priority Fauna Search Results are shown in **Table 11**. Species annotated with [1] were included in the DEC Priority fauna species list while species annotated with [2] were included in the *Protected Matters Search Tool*.

TABLE 11
THREATENED AND PRIORITY FAUNA DATABASE SEARCH RESULTS

THREATENED SPECIES		***EPBC Act (1999)* – Status[2]**	***Wildlife Conservation Act 1950* - Status [1]**	**DEC LISTING**
Dasyurus geoffroii [2]	Western Quoll, Chuditch	Vulnerable	Schedule 1	T – VU
Isoodon obesulus subsp. *fusciventer* [1]	Southern Brown Bandicoot, Quenda	-	-	P5
Macropus Irma [1]	Western Brush Wallaby	-	-	P4
Pseudocheirus occidentalis [1] [2]	Western Ringtail Possum	Vulnerable	Schedule 1	T
Calyptorhynchus banksii subsp. *naso* [2]	Forest Red-tailed Black Cockatoo	Vulnerable	Schedule 1	T – VU
Calyptorhynchus latirostris [2]	Carnaby's Cockatoo	Endangered	Schedule 1	T – EN
Calyptorhynchus baudinii [1] [2]	Baudin's Black-Cockatoo	Vulnerable		
Botaurus poicileptilus [2]	Australasian Bittern	Endangered	-	
Falco peregrinus subsp. *macropus* [1]	Peregrine Falcon	-	Schedule 4	S
Migratory Species				
Apus pacificus [2]	Fork-tailed Swift	Migratory		
Ardea alba [2]	Great Egret	Migratory		
Ardea ibis [2]	Cattle Egret	Migratory		
Halieetus leucogaster [2]	White-bellied Sea Eagle	Migratory		
Merops ornatus [2]	Rainbow Bee-eater	Migratory		

6.11.2.2 Reconnaissance Survey

A two-day reconnaissance survey of the site was undertaken immediately prior to the trapping survey and included:

- Searching for evidence of conservation significant fauna species by identification of tracks, scats, bones, diggings and opportunistic searches;
- Accurately assessing ecological processes that may interact with the proposed development; and
- Identifying significant habitats.

6.11.2.3 Detailed Survey

A detailed survey with trapping program followed the reconnaissance survey focussing on habitat likely to contain conservation significant fauna species. Sampling techniques included:

- Trapping in identified significant habitat using funnel traps with drift fences
- Recording bird species
- Recording bird and frog calls
- Searching for tracks, scats, bones and diggings
- Spotlighting/headtorching (on foot)
- Hand searching litter
- Anabat recordings for bat species
- Train cameras set on pathways and obvious activity sites

A targeted search for Western Ringtail Possum was undertaken and included spotlighting for individuals at night and actively searching for dreys, tree hollows and scats during the day and recording these with a hand-held GPS.

The Level 2 fauna survey report (Ecoscape, 2012) is included as **Appendix 5**.

6.11.2.4 Habitat Description

Ecoscape's (2010) flora and vegetation assessment of Armstrong Reserve recognised three vegetation types corresponding to their related landscape position (dampland, midslope and upland). These vegetation types are quite similar to each other in terms of tree composition and vegetation structure (**Figure 7**), so the main difference in terms of fauna habitat is the presence of surface water. For example, four of the five species of frogs detected are dependent on 'swamp' habitat, and Pacific Black Ducks were also observed close to the creek during the September 2011 survey. Fallen logs, branches and patches of thick understorey vegetation occur within each of the vegetation types and provide shelter for terrestrial mammals (some of which *might* be native) and reptiles; all species present would be able to move throughout the reserve.

6.11.2.5 Fauna Inventory

The predicted number of fauna species compared with the total number of species observed and conservation significant species recorded during the Level 1 and Level 2 surveys from each major vertebrate group is shown on **Table 12** (over the page).

TABLE 12
NUMBER OF VERTEBRATE SPECIES EXPECTED FROM DESKTOP REVIEW AND SPECIES RECORDED ON-SITE

FAUNA GROUP	DESKTOP REVIEW	CONSERVATION SIGNIFICANT SPECIES THAT MAY OCCUR	LEVEL 2 SURVEY RECORDED	RECORDED CONSERVATION SIGNIFICANT SPECIES
Amphibian	11		2	
Reptiles	36		2	
Avifauna	169	10	16	
Mammals	32	4	1	1
Introduced	10			
TOTAL	**258**		**21**	**1**

Seven Threatened and Priority fauna species, excluding listed marine species, were identified through the DEC Threatened and Priority fauna database search as being found within or near to the site (5 km buffer).

A search of *NatureMap* identified 125 terrestrial fauna species including seven conservation significant fauna species as potentially occurring on-site (3 km buffer).

The EPBC *Protected Matters Search Tool* (3 km buffer) identified 23 threatened species which may potentially occur on or in the vicinity of the site (Government of Australia, 2011).

A full inventory of the species known or expected to occur both on-site and in the Dunsborough area, based on the PMST, NatureMap, other sources, and the Level 2 survey that was conducted on-site is included in **Appendix 5** (refer to Appendix 1 of that report).

The following is a brief synopsis of the fauna inventory found on-site during the Level 2 fauna survey:

Amphibians
Eleven amphibian species were expected to occur on-site however only two species were recorded through trap captures: the Moaning Frog (*Heleioporus eyrie*) and the Pobblebonk Frog (*Limnodynastes dorsalis*). All individuals were caught in funnel traps. The Clicking Frog (*Crinia glauerti*), Quacking Frog (*Crinia Georgiana*) and Turtle Frog (*Myobatrachus gouldii*) were recorded opportunistically by their calls (Ecoscape, 2012).

None of the amphibian species that were either trapped or opportunistically recorded are conservation significant species.

Reptiles
Thirty-six species of reptile were expected to occur on-site however only two reptile species were recorded through funnel trap captures: the Pale-flecked Morethia (*Morethia lineocellata*) and the Red-legged Ctenotus (*Ctenotus labillardieri*). A number of opportunistic sightings were also made of the Three-toed Skink (*Hemiergis peronii tridactyla*) (Ecoscape, 2012).

None of the reptile species, either trapped or opportunistically recorded, are conservation significant species.

Avifauna
Sixteen species of birds were identified by sight or call during three sessions of bird census conducted over three days, the number of individuals ranging from one to six. An additional four species were opportunistically identified by calls during site surveying. Red Wattlebirds (*Anthochaera arunculata*), Magpies (*Cracticus tibicen*), Ravens (*Corvus coronoides)* and Grey Butcherbirds (*Cracticus torquatus*) were frequently recorded in relatively high numbers at the site (Ecoscape, 2012).

None of the avifauna species identified through either the bird census or opportunistically recorded, are conservation significant species.

Mammals
Although four conservation significant mammal species were predicted to occur on-site, *Pseudocheirus occidentalis* (Western Ringtail Possum) was the only native mammal observed. No signs (e.g. scratchings, diggings or scats) were observed of any other native mammal species.

Introduced Mammals
Rabbit (*Oryctolagus cuniculus*) diggings were observed throughout the site, and while no foxes (*Vulpes vulpes*) were observed, two dogs (*Canis lupus familiaris*) were observed and traces of cat (*Felis catus*) were also observed.

6.12 Specially Protected (Threatened) Fauna

6.12.1 Black Cockatoos

The *Protected Matters Search Tool* (Australian Government, 2011) identified that the three species of Black Cockatoo: *Calyptorhynchus banksii* subsp. *naso* (Forest Red-tailed Black Cockatoo), *Calyptorhynchus latirostris* (Carnaby's Cockatoo) and *Calyptorhynchus baudinii* (Baudin's Black Cockatoo), potentially occur on-site or within the 3km buffer of the site (Ecoscape, 2012).

Information contained within the Level 2 flora and vegetation survey indicates that potential habitat for Black Cockatoos occurs across the site. This includes Marri (*Corymbia calophylla*) found in all vegetation types and scattered throughout the site, Flooded Gum (*Eucalyptus rudis*) scattered throughout the northern half of the site, Swamp Banksia (*Banksia littoralis*) in the midslope area found in the northern and south-eastern parts of reserve, Hakeas - *H. prostrata* (one quadrat near the northern corner of the site) and *H. varia* (scattered throughout the site), and Snottygobble (*Persoonia longifolia*) found in the northern part of the site).

However, no evidence of Black Cockatoo roosting, breeding or foraging was found on-site during either the Level 1 fauna survey undertaken in 2006 or the Level 2 Fauna Survey undertaken in 2011,

During the Level 1 fauna survey, a targeted search was conducted for the Western Ringtail Possum during which a number of tree hollows were identified within the site. ATA

Environmental observed that while two of the hollows were one of the hollows (Hollow 7) was potentially of a suitable diameter for Carnaby's breeding purposes (i.e. Hollows 4 and 7) only Hollow 7 was of a sufficient height above ground likely for Carnaby's breeding purposes. Hollow location and descriptive comment is included in **Table 13**.

TABLE 13
HOLLOW LOCATION AND DESCRIPTIVE COMMENT

HOLLOW No.	LOCATION		COMMENT
1	S33°36.625'	E115°06.261'	2.5m high in a 12m high Eucalypt; 250mm diameter hollow entrance to hollow
2	S33°36.591'	E115°06.281'	2 hollows in a 10m high Eucalypt; WRP present
3	S33°36.607'	E115°06.253'	5m high in a 15m Eucalypt; 200mm diameter entrance to hollow
4	S33°36.667'	E115°06.312'	4m high in a 8m Eucalypt; 400mm diameter entrance to hollow
5	S33°36.612'	E115°06.304'	7m high in a 9m Eucalypt; 200mm diameter entrance to hollow
6	S33°36.624'	E115°06.324'	2.5m high in a 15m Eucalypt; 200mm diameter entrance to hollow
7	S33°36.629'	E115°06.320'	15m high in a 18m Eucalypt; 400mm diameter entrance to hollow
8	S33°36.675'	E115°06.277'	5m high in a 18m Eucalypt; 300mm diameter entrance to hollow
9	S33°36.651'	E115°06.311'	10m high in a 15m Marri tree
10	S33°36.650'	E115°06.310'	10m high in a 15m Marri tree
11	S33°36.643'	E115°06.310'	10m high in a 15m Marri tree

As shown in **Figure 9**, Hollow 7 is not located within the proposed development footprint and will therefore not be impacted.

In terms of the *Significant Impact Guidelines 1.1 Environmental Protection and Conservation Act 1999* (DEWHA, 2009), when applied in terms of impact on Black Cockatoo habitat, given the lack of evidence that the site has previously or is currently providing roosting or nesting habitat and the relatively small area of potential foraging habitat that is proposed to be cleared from within the proposed development footprint, it is considered that implementation of the proposed action would not result in a 'significant impact' on any of the listed Black Cockatoo species or their associated habitat.

6.12.2 Western Ringtail Possum

The Western Ringtail Possum (*Pseudocheirus occidentalis*) was found on-site during a Level 1 fauna survey undertaken in 2005 (ATA Environmental, 2005) and is listed as a Schedule 1 species (i.e. 'Fauna that is rare or likely to become extinct') under the Western Australian *Wildlife Conservation Act* (*1950)*, and as 'Vulnerable' under the Commonwealth EPBC Act.

Level 2 targeted surveys for Western Ringtail Possum were conducted by ATA Environmental in 2005 and 2007 (ATA Environmental, 2006; ATA Environmental, 2007). The surveys were undertaken in accordance with EPA's Guidance Statement No. 56 (Environmental Protection Authority, 2004b) and Position Statement No. 3 (Environmental Protection Authority, 2002).

6.12.2.1 Regional Survey

As part of the State environmental approvals process, the DEC determined that additional survey effort was necessary to place the proposed impact on Western Ringtail Possum at Armstrong Reserve into a broader regional context. The extent of the survey area was identified by the DEC as 'Old Dunsborough' included the site and land within a radius of 500 m of the site. The DEC believed this survey was required to 'adequately evaluate the probable impact of the proposal on Western Ringtail Possum at this locality'. The DEC requested that all trees within street verges or clumps of trees that form greater than 0.5 ha were also to be investigated during the survey. Particular survey effort was required to be made within Marri Reserve and creeklines to the south-east and north-west of the site (Kim Williams pers. comm. Regional Leader for Nature Conservation, email 9 January 2007). The surveys were also undertaken to determine the significance of the site as habitat for the Western Ringtail Possum and to determine how the impacts of the proposed development will be managed to minimize impacts on and protect the Western Ringtail Possum population on the site (ATA Environmental, 2007).

Both day and night surveying was undertaken between the 25-31 March 2007 with the purpose of the survey being to record the available habitat types and count the number of Western Ringtail Possum and dreys in the designated survey area. No fauna trapping was conducted as part of this fauna assessment.

A thorough search was made of the canopy of each tree in the designated area, with all dreys being numbered and their location recorded using a hand-held GPS.

The location of Western Ringtail Possum was determined by searching for individuals at night (spotlighting) carried out on foot using halogen head torches between 1930 and 0200 hrs. Particular attention was paid to areas where possum dreys had been observed and the location of all Western Ringtail Possum observed recorded with a GPS. As it was not possible to search the entire area each evening, the survey area was divided in five zones, and each zone searched at least twice on non-consecutive evenings. Different observers searched each zone during the second search of the area.

The zones chosen were:

- Armstrong Reserve – Zone 1 (approx. 4.1 ha);
- Marri Reserve – Zone 2 (approx. 11.9 ha);

- The block of native vegetation to the west of Cape Naturaliste Road – Zone 3 (approx. 21.1 ha);
- The remnant vegetation corridor along the northern boundary of the survey area – Zone 4 (Greenhaven Park) (approx. 6.7 ha); and
- Residential housing, street and verges – Zone 5 (approx. 81.1 ha).

A total of 306 WRP dreys were recorded in the survey area in March 2007. The density of dreys was lowest at Marri Reserve (1.76/ha) and highest in the Northern Corridor (7.61/ha). The density of dreys in the Residential Area, Western Bushland and Armstrong Reserve were all similar (2.13/ha-3.41/ha). The density of dreys at Armstrong Reserve was higher in September 2005 compared to March 2007 (i.e. 5.12/ha).

The number of Western Ringtail Possum in each zone varied on different evenings indicating that in all likelihood movement was occurring between zones. The highest number of Western Ringtail Possum observations were recorded within the residential area (50.7%) followed by the Western Bushland (18.5%) and Northern Corridor (17.8%) zones. However, when the maximum number of Western Ringtail Possum observed in any zone was compared with the size of the area, Armstrong Reserve had the highest density (6 possums/ha). Density ratios were similar for Marri Reserve (2.7:1) and the Northern Corridor (3.3:1), but these were much larger than the Western Bushland (0.7:1) and Residential Areas (0.8:1) (ATA Environmental, 2007).

Given the relatively high density of Western Ringtail Possum (3.3/ha) and low density of dreys (0.43/ha) within the Northern Corridor, this area appears to provide the highest habitat value for supporting Western Ringtail Possum in Old Dunsborough (ATA Environmental, 2007).

The surveys of the site and Old Dunsborough confirmed the presence of Western Ringtail Possum with records of occurrence appearing to coincide with remnant patches of habitat. However, Western Ringtail Possum was also recorded at locations with as few as eight to ten retained trees and at locations of streetscape plantings (ATA Environmental, 2007).

The Level 2 targeted Western Ringtail Possum survey report for the site and Old Dunsborough (ATA Environmental, 2007) is included as **Appendix 6**.

6.12.2.2 Monitoring Program

While the 2007 survey (ATA Environmental, 2007) provided extensive data on the occurrence of Western Ringtail Possum in the Old Dunsborough area generally and reconfirmed Western Ringtail Possum presence on-site, there was no reason to believe resurveying the Old Dunsborough survey area with the same methodology, where presence and the location of each sighting was reported, would result in any additional information (Dr Paul de Tores, pers. comm). An alternative was therefore proposed whereby estimates of Western Ringtail Possum population size will be derived for the site and for an area of similar habitat (yet to be identified) where vegetation clearing will not occur during the period of the proposed long-term study.

In consultation with staff from the DEC Science Division, the University of Western Australia (UWA) and Ecoscape, a monitoring program has been prepared to:

(i) Derive a quantitative estimate of the Western Ringtail Possum population size within the site; and

(ii) Assess the immediate and long-term effects, from the proposed development, on the Western Ringtail Possum population within the site.

The monitoring program acknowledges that some Western Ringtail Possum will likely be displaced by the proposed development should it proceed. Where these displaced possums have been left *in situ* at other development sites within south-west Western Australia, the fate of the displaced possums is unknown. Where possums have been translocated from development sites, the translocation outcomes have been varied. Self-sustaining Western Ringtail Possum populations appear to have become established at some sites, at others there has been a high level of mortality attributed to predation by cats (*Felis catus*) and south-west carpet pythons (*Morelia spilota imbricata*) (Dr Paul de Tores, pers. comm.).

During the Level 2 fauna survey (Ecoscape, 2012) the population size (abundance) and density of Western Ringtail Possum was estimated using Distance Sampling methodology as described by Buckland *et al*. (2004). Distance Sampling is based on data collected from repeated spotlight counts of individual possums detected from nocturnal line transect surveys. The methodology was previously used to estimate the population size of Western Ringtail Possum at an iconic conservation reserve, Locke Nature Reserve, Busselton wherein the reported estimates indicated the population was approximately twice that reported from *ad hoc* survey techniques (de Tores and Elscot, 2010). Distance Sampling therefore enables quantitative assessment of population size, i.e. robust and reliable estimates with all assumptions clearly stated, assessment of whether these assumptions are met and the derived estimates provided with confidence intervals and estimates of variance. The methodology acknowledges imperfect detection (i.e. the estimates are derived in the knowledge that not all animals will be detected during the survey) and incorporates a model selection approach to enable competing models to be compared to determine which model (or set of variables with the potential to influence detection and/or abundance) best describe the data.

A series of semi-permanent transects were established within the habitat to be retained within the site and temporary transects were established within habitat contained within the proposed development footprint (**Figure 10**). An estimate of the Western Ringtail Possum population size and density was derived during the targeted survey undertaken in 2012, pre commencement of any proposed site works. The program DISTANCE was used to analyse the data and provide estimates of density of Western Ringtail Possum on-site. Density estimates were derived using DISTANCE Sampling protocols and the Line Transect option of the software DISTANCE 4.0 (Thomas *et al.,* 2002).

Table 14 (over the page) identifies that a total of nine Western Ringtail Possum were observed while spotlighting along the line transects (Ecoscape, 2012). The density of Western Ringtail Possum per hectare was estimated with the Distance Program (Thomas *et al.,* 2010), using the factors of transect length, perpendicular distance to sighting from line and number of individuals observed at that point on the line. Based on analysis of the line transect data, the population of Western Ringtail Possum inhabiting the site was estimated as 29.5 (estimated density of 8.3981 Western Ringtail Possum/ha) with rather broad confidence intervals (12.0 – 72.2) due to the low number of independent sightings. The density estimate does not differ significantly from those obtained using similar methodology, but more intensive surveys at sites to the east of Dunsborough (de Tores and Elscot, 2010).

The Distance Program also calculated the Effective Strip Width to be approximately 7.94 m, within which there was a 91.6% probability of observing a Western Ringtail Possum.

TABLE 14
WESTERN RINGTAIL POSSUM SIGHTINGS AND DISTANCE TO SIGHTINGS ALONG LINE TRANSECTS

Line Transect No.	Line Transect Length (m)	Distance to Sighting Line (m)	No. WRP Observed At Point on Line
1	100	2.57	1
2	100	5.13	1
2	100	6.43	2
3	100	8.66	2
3	100	1	1
4	150	0.68	1
5	75	3.46	1

Source: Ecoscape (2012)

The number of dreys recorded on-site (14) is the same as reported by ATA Environmental (2007) in the targeted survey conducted in March 2007 when the estimated on-site density of Western Ringtail Possum was 6/ha based on the number of individuals directly observed rather than a line transect. The density was considered by ATA Environmental to be a possible underestimate (refer to **Section 6.12.1**). Based on the discussion in de Tores and Elscot (2010), the ATA Environmental estimate does not differ significantly from that obtained in this study and thus no trend of population increase or decrease can be inferred over recent years.

6.12.3 Identifying On-site Western Ringtail Possum Habitat

The Background Paper to *EPBC Act Policy Statement 3.10 – Significant impact guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan coastal Plain* (DEWHA, 2009a) identifies the site as being located in Area 3 – Supporting habitat. Supporting habitat includes vegetation patches that:

- buffer key local populations from threats, as well as providing foraging, breeding and dispersal opportunities; and
- provide the opportunity for immigration source and emigration destination to allow for natural fluctuations in the species' fecundity (DEWHA, 2009a).

During the Level 2 fauna assessment, the following site investigations were undertaken to determine the extent of the habitat found on-site and the impact that clearing the proposed development footprint would have on existing habitat:

1. Undertaking a feature tree survey (using breast height diameter as a guide to classify trees) to determine the exact location of all *Agonis flexuosa* (Peppermint) tree to the east of the drainage reserve (Lot 258) the area in which a development footprint was proposed to be constructed.

2. Working out the proportion of any proposed development footprint containing Western Ringtail Possum habitat.
3. Working out the area of understorey within any proposed development footprint that will be cleared.

Figure 10 shows the location of the mapped significant trees and habitat.

A total of 294 Peppermint trees were recorded in the area to the east of the Lot 258 drainage reserve. Of these, 174 Peppermint trees occur within the proposed development footprint which also contains approximately 9020 m^2 of Western Ringtail Possum habitat understorey (**Figure 10**).

6.13 Regional Significance of the Site

Guidance Statement No. 10 *Level of Assessment for Proposals Affecting Natural Areas within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region* (Environmental Protection Authority, 2006) addresses the environmental assessment of proposals, planning schemes and scheme amendments involving the clearing of, or other significant impacts upon, natural areas within the System 6 Region and Swan Coastal Plain portion of the System 1 Region.

During the development of the ESD, the EPA requested that the regional conservation significance of the site be determined using the six criteria defined in the EPA's Guidance Statement No. 10, and that this determination include consideration of flora, vegetation, fauna, wetland and ecological linkage values.

Table 15 (over the page) presents an assessment of the site's environmental characteristics against the six criteria identified within Guidance Statement No. 10, namely:

(i) Representation of Ecological Communities
(ii) Diversity
(iii) Rarity
(iv) Maintaining Ecological Processes or Natural Systems
(v) Scientific or Evolutionary Importance
(vi) General Criteria for Protection of Wetland, Streamline, and Estuarine Fringing vegetation and Coastal Vegetation

Except for criteria (v) 'Scientific or Evolutionary Importance,' the assessment has identified that the site meets five of the six criteria for regionally significant vegetation as defined by the criteria.

TABLE 15
REGIONAL SIGNIFICANCE OF ARMSTRONG RESERVE

REGIONALLY SIGNIFICANT NATURAL AREAS (SYSTEM 6/1 AREA) [1]

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
REPRESENTATION OF ECOLOGICAL COMMUNITIES ***A number of areas selected to represent the range of ecological communities and the places in which these communities merge***	
Scope: Regional representation will be primarily based upon the target of achieving: - Comprehensive and adequate representation of each floristic community type within each vegetation (in uplands and vegetated wetlands) - Comprehensive and adequate representation of each natural wetland group and wetland type within each group.	
Inclusion guidelines: - Areas which are good examples of each floristic community type, selected to be representative of the vegetation of a geomorphic unit. - Areas contributing to at least 30% of each vegetation complex in at least 10 separate areas. In the defined constrained area this may be modified to at least 10%. - Best available examples of each natural wetland group and wetland types within each group. - Areas identified as being of national or international significance through treaty/convention/policy.	No TECs (either State or Commonwealth) were recorded from on-site. Priority 1 Ecological Community *"Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area" (Webb *et al.* 2009) identified on-site. NOTE: Regional representation of the very best examples of FCTs and Vegetation Complexes implies condition data is available for these at a regional scale and this information is readily not. In lieu of regional data being available which may enable some of the exclusion guidelines to be applied, the following assessment has been made based on Ecoscape (2010) spring flora and vegetation survey report. The EA Griffin & Associates' analysis concluded that the vegetation on the site does not match the Gibson *et al.* (1994) Floristic Community Types well. While the data had some similarity with several FCTs it was concluded that the three Dunsborough reserves may contain vegetation that was not sampled in the Gibson *et al.* (1994) survey and as such may represent a potentially new FCT based on statistical analysis. Vegetation found on-site is in a predominantly excellent condition in a widely cleared area. The site is representative of the Abba Complex that has 6% (3198 ha) of its original

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
	extent remaining on the Swan Coastal Plain of which 0.1% is in secure reserves and is therefore considered to be 'Endangered'. At the Beard Vegetation Association level, vegetation associated 973 has nearly 40% of its original extent remaining while approximately 29% of vegetation association 1000 remains. On the basis of EPA benchmarks for percentage retention of vegetation complexes, the vegetation is considered to be regionally significant. The site is not recognised as having national significance through listing on the Register of the National Estate. The site is not recognised as having international significance through listing as a Ramsar site.
Exclusion guidelines: - Vegetation which does not satisfy the definition of bushland (unless it is the best example of its type with particular reference to fauna habitat). - Areas which are not the best available examples of particular ecological communities (floristic community type/vegetation complexes/threatened ecological communities) because there are more appropriate (bigger, better condition, richer/more diverse) areas elsewhere.	**Not applicable**
DIVERSITY ***Areas with a high diversity of landforms, flor and/or fauna species or communities in close association***	
Scope: The conservation of important areas, by virtue of their richness, diversity or complexity for their physical or biological attributes at the community, species or genetic level. This will be primarily based on areas supporting: - A wide variety of landform units; - A wide variety of flora and/or fauna species; - Unusual concentrations of subspecies or varieties occurring together; - A wide representation of floristic community types in close proximity; - Species-rich examples of communities of their type; a wide variety of plant associations, assemblages or communities.	

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
This criterion will commonly support other criteria for selection of representative areas.	
Inclusion guidelines: - Areas with high flora diversity at the community, species or genetic level. - Areas with a high diversity of plant associations, assemblages or communities relative to the area. - Areas with a high diversity of faunal assemblages.	A Level 2 Fauna Survey (Ecoscape, 2012 [3]) including trapping recorded 21 vertebrate species: 2 amphibia, 1 mammal, 2 reptiles and 16 bird species – mostly wide-ranging species. One species recorded was conservation significant – Western Ringtail Possum (State and Commonwealth listings). Ecoscape[3] identified that fauna species may be described as regionally conservation significant if they are listed under the EPBC Act, *Wildlife Conservation Act* or Bush Forever list of threatened species:. A species may be of local significance to a site if there are known records (e.g. DEC database, NatureMap, Protected Matters Search Tool or from other surveys) from within 10 km of the site. Based on these criteria, the site would be of local significance for the following species: - Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) - Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) - Australasian Bittern (*Botaurus poiciloptilus*) - Peregrine Falcon (*Falco peregrinus*) - Western Ringtail Possum (*Pseudocheirus occidentalis*) - Southern Brown Bandicoot (*Isoodon obesulus fusciventer*) - Western Brush Wallaby (*Macropus irma*) - Western Quoll (*Dasyurus geoffroi*) Only the Western Ringtail Possum has been recorded on-site[3]. The site comprising 4.3 ha represents a moderate diversity with a total of 178 species recorded in the 2009 survey of the site[2]. This included 135 native and 13 introduced species. In terms of conservation significant flora species, 20 individual *Eucalyptus rudis* subsp. *cratyantha* (Priority 4) individuals were located on-site. No Declared Rare Flora or

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
	other Priority Listed Flora species have been recorded during any of the Armstrong Reserve surveys, which have been undertaken in 2006, 2007 and 2008 (Coffey Environments, 2008) or during the Ecoscape survey in 2009. Priority 4 species are described as being rare but not currently threatened (Department of Environment and Conservation, 2010). *Eucalyptus rudis* subsp. *cratyantha* is known from the Serpentine River, south to Wilyabrup (Western Australian Herbarium and Department of Environment and Conservation, 2010) and therefore could not be considered regionally significant. Webb (2008a) listed a number of species considered to be of conservation significance, largely due to their occurrence on Armstrong Reserve being extensions of their previous known range, including onto the Swan Coastal Plain, and their occurrence being at the extremity of their range. Of those whose identity were confirmed during the Ecoscape survey[2], *Leucopogon hirsutus* was the first record from the SCP (its usual distribution is in the Jarrah Forest and Warren bioregions), and *Orthrosanthus laxus* is reported to be poorly collected on the SCP (Webb, 2008a; Webb *et al*., 2009), despite it appearing to have a wide distribution on FloraBase (Western Australian Herbarium & Department of Environment and Conservation, 2010) including the SCP. *Cryptostylis ovata* and *Ottelia ovalifolia* were not recorded by Ecoscape or Coffey Environments, and were presumed to have been identified by the DEC. These species' significance is in *Cryptostylis ovata* being poorly recorded on the SCP, and *Ottelia ovalifolia* not previously being recorded from the SCP south of Bunbury (Webb, 2008a). All of these species have a wide distribution and are not considered to be threatened. Webb *et al.* (2009) include a list of species considered to be significant taxa on the Busselton Plain. None of the included species that were recorded from Armstrong Reserve have conservation significance (i.e. none are DRF or Priority Listed Flora) but have other forms of significance. They include: - *Baumea rubiginosa*, whose only extant population on the SCP is believed to be on Armstrong Reserve

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
	- *Lomandra pauciflora*, that is usually found in the Jarrah and Karri forests and has only few populations on the SCP - *Anigozanthos flavidus*, listed as a wetland species but has no additional reason for listing as a significant taxa in Webb *et al.*(2009) - *Orthrosanthus laxus*, poorly collected on the SCP (see above) - *Caladenia brownii*, usually found in Karri forest - *Amphibromus nervosus*, described as indicative of claypans on the Pinjarra Plain - *Acacia divergens*, described as a wetland species with disjunct populations on the SCP - *Daviesia divaricata*, known from disjunct populations on the SCP - *Kennedia coccinea*, described as uncommon on the SCP. The inclusion of the above listed species are, in some cases, due their usual occurrence being on landforms other than is generally included on the SCP. This is considered to be in response to the underlying geology, which is unique due to the closeness of the coast and the Leeuwin Naturaliste Ridge. However the species inclusion in lists of significant taxa is a matter of opinion in regard to what is considered as being significant, nor can 'significant taxa' be definitive unless there has been a considerable number of surveys in the region that can determine local rarity or commonality, which has not occurred in the Dunsborough area (Ecoscape, 2012[2]). No Threatened flora species on either the State or Commonwealth listings were recorded during site surveying[2]. The Statement of Botanical Survey Limitations was included in Ecoscape[2] cites an estimated 93% of the flora species from site were identified to species level.
RARITY ***Areas containing rare or threatened communities or species, or species of restricted distribution***	
Scope: This criterion applies to aspects of the environment which are rare or relatively rare, and can encompass any environmental, biological or ecological feature or phenomenon whic can be regarded as outstanding because it is one of the few of its type.	

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
Inclusion guidelines: - Threatened ecological communities. - Habitats of rare, uncommon or restricted flora and/or fauna species and/or species outside of or at the limit of their normal range. - Areas supporting rare, uncommon or restricted communities and/or communities outside of or at the limit of their normal range.	No TECs under Federal or State legislation were recorded within the site. No Threatened Flora species were recorded within the site. One Priority plant species (*Eucalyptus rudis* subsp. *cratyantha*) and nine species of other significance identified by Webb *et al* (2009) have been recorded within Armstrong Reserve. Twenty individual *Eucalyptus rudis* subsp. *cratyantha* (Priority 4) individuals were located on Armstrong Reserve. No Declared Rare Flora or other Priority Listed Flora species have been recorded during any of the Armstrong Reserve surveys, which have been undertaken in 2006, 2007 and 2008 (Coffey Environments, 2008) or during the Ecoscape survey in 2009. Priority 4 species are described as being rare but not currently threatened (Department of Environment and Conservation, 2010). *Eucalyptus rudis* subsp. *cratyantha* is known from the Serpentine River, south to Wilyabrup (Western Australian Herbarium and Department of Environment and Conservation, 2010) and therefore could not be considered regionally significant.· Twenty flora species not recorded in the Swan Coastal Plain (SCP) dataset (Gibson *et al.* 1994) were found on-site. Range extensions (*Webb et.al*. (2009) lists a number of species recorded in Armstrong reserve considered to be significant due to their occurrence being extensions of their previous known range, including onto the Swan Coastal Plain, and their occurrence being at the extremity of their range). The Abba Vegetation Complex is found on-site - only 6% remaining and 0.1% in secure tenure. A vegetation type found on-site: nominated PEC "*Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area" (Webb *et al.* 2009) has not been described elsewhere. Habitat of the conservation significant *P. occidentalis* and potential Baudin's Black Cockatoo was recorded on-site. The species are listed on State and Commonwealth lists of conservation significant species.

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
Exclusion guidelines: - Habitats of species or communities whose significance (as described above) is not established. - Areas which, in supporting outlying species or communities, are replicated by better examples elsewhere.	Habitat of the Western Ringtail Possum was on-site. The EPBC Act Policy Statement 3.10 "*Significant Impact Guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan Coastal Plain, Western Australia*" (DEWHA, 2009) identifies three key Western Ringtail Possum habitat areas (Area 1 – Core habitat; Area 2 – Primary Corridors; Area 3 – Supporting habitat). The site is located in Area 3 – Supporting habitat. Better examples of Western Ringtail Possum habitat are therefore to be found in the Busselton to Ludlow area.
MAINTAINING ECOLOGICAL PROCESSES OR NATURAL SYSTEMS ***Maintenance of ecological processes or natural systems at a regional or national scale***	
Scope: This criterion applies to areas which are important in the maintenance of existing process or natural systems. This criterion would normally be used in conjunction with other criteria for the selection of representative areas.	
Inclusion guidelines: - Large areas in natural condition with natural processes intact or largely so. - Fauna habitats providing specific requirements for feeding/breeding/nursery functions. - Substantive wildlife corridors connecting bushland areas. - Habitats for significant populations of migratory birds.	Natural processes are largely intact particularly where the vegetation within the site is in a Very Good to Excellent condition. The site provides an ecological linkage connecting with other bushland remnants such as Marri Reserve located to the west. The design of the proposed development has been adjusted to ensure that a linkage, particularly for Western Ringtail Possum is maintained enable movement to continue to occur between the site and the adjacent Marri Reserve. The site is not recognised as being of national or international significance for any migratory bird species.
Exclusion guidelines: - Areas which are replicated by other areas supporting significant populations or in better condition. - Areas not recognised as being of national or international significance for migratory birds.	**Not applicable**

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
SCIENTIFIC OR EVOLUTIONARY IMPORTANCE ***Areas containing evidence of evolutionary processes either as fossilised material or as relict species and areas containing unusual or important geomorphological or geological sites. Areas of recognised scientific and educational interest as reference sites or as examples of the important environmental processes at work***	
Scope: This criterion applies generally to areas which contain evidence of past ecological or biological processes, and unusual or important geomorphological or geological sites and to areas which have recognised value as research sites, type localities or to sites having reference or benchmark value. This criterion will usually support other criteria for selection of representative areas.	
Inclusion guidelines: - Areas with unusual or important geomorphological or geological sites. - Areas with remains of flora and fauna now extinct (fossil sites). - Areas with primitive or relict flora or fauna surviving from earlier times. - Area with fossil or other records of identifiable past climates or environments. - Long-term scientific/educational monitoring sites or study areas.	**Not applicable**
Exclusion guidelines: - Areas in which the evidence of past processes is not clearly established. - Areas which are replicated by places with clearer evidence of the above or in better condition. - Areas not identified as important geomorphological sites. - Areas not identified as important geological sites.	**Not applicable**
GENERAL CRITERIA FOR PROTECTION OF WETLAND, STREAMLINE, AND ESTUARINE FRINGING VEGETATION AND COASTAL VEGETATION ***Conservation Category Wetland areas including fringing vegetation and associated upland vegetation; coastal vegetation within the accepted coastal management zone***	
Scope: This criterion applies to Conservation management category wetlands, their vegetation (including fringing vegetation) and associated upland vegetation; streamline/riverine/estuarine fringing vegetation; and to coastal vegetation within the accepted coastal management zone.	
Inclusion guidelines: - Conservation Category Wetlands and their native vegetation (including fringing vegetation) and associated upland vegetation. - Streamline/riverine (channel wetlands) and estuarine fringing native vegetation.	In 2008, the DEC (South West Regional Office) mapped an area of the site as a wetland describing the vegetation as consisting entirely of *Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area, which subsequently has been listed nominated as a

ENVIRONMENTAL PROTECTION AUTHORITY (2006b) Criteria	ARMSTRONG RESERVE, DUNSBOROUGH
- Coastal vegetation and natural landform units within the accepted coastal management zone. These areas may also be included in regionally significant natural areas that go beyond the coastal zone. - Streamline/riverine (channel wetlands), estuarine and coastal areas that are part of a regional linked (or potentially linked) sequence of communities.	Priority 1 Ecological Community (Webb, 2008a). The plant community contained within the wetland is thought to be dependent upon seasonal freshwater subsoil moisture for survival and that this water is delivered to the community by subsurface flow from the groundwater seepage feature found within Marri Reserve to the west of the site. It is important to note, that a dominant physical feature of the site is an area set aside for drainage purposes on Lot 258 (R40445) bisecting the central portion of the site. This area connects a naturally occurring drainage line whose origin is to the west of Cape Naturaliste Road and flows through Marri and Armstrong Reserves where it connects with underground stormwater pipe network located within the Gifford Road road reserve. Much of the drainage line as it appears on site has been historically engineered to ensure that its stormwater capacity is maintained to prevent flooding to surrounding residential areas. The DEC's wetland mapping (2008) includes this reserve.
Exclusion guidelines: - Significantly altered wetlands, such as Resource Enhancement and Multiple Use management category wetlands. At times, altered wetlands may be considered to be regionally significant natural areas under other criteria. - Cleared or developed coastlines.	No wetlands are mapped as occurring on-site according to either the Wetland Atlas mapping of Hill *et al*. (1996), the DEC's *Swan Coastal Plains Wetlands Geomorphic dataset* as depicted on the *WA Atlas* (https://www2.landgate.wa.gov.au/bmvf/app/waatlas/), or as being nationally or internationally significant.

Source: [1] **Environmental Protection Authority (2006b)**
[2] **Ecoscape (2010)**
[3] **Ecoscape (2012)**

7. IDENTIFICATION OF ENVIRONMENTAL FACTORS, IMPACTS AND MANAGEMENT

The EPA has determined that the following environmental issues/factors are relevant to the proposal to develop an aged care facility at Armstrong Reserve, Dunsborough:

Biophysical Environment
- Vegetation and Flora
- Specially Protected (Threatened) Fauna

Pollution Management
- Soil Quality

The application of each of these environmental issues/factors to the proposal to develop a portion of Armstrong Reserve for the purpose of constructing an aged care facility is dealt with in **Sections 7.1 – 7.3**.

7.1 Flora and Vegetation

7.1.1 Area of Assessment

The area of assessment includes the whole site as shown in **Figure 2**.

7.1.2 Environmental Objective

The EPA's objective for flora and vegetation is *"to maintain the abundance, diversity, geographic distribution and productivity of flora at the species and ecosystem levels through the avoidance or management of adverse impacts and through improvement in knowledge."* (Office of the Environmental Protection Authority, 2010b)

7.1.3 Relevant Legislation, Policy and Guidelines

- *Environmental Protection Act 1986*
- *Wildlife Conservation Act 1950*
- *Environment Protection and Biodiversity Conservation Act 1999*
- Environmental Protection Authority (2004a) *Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessments in Western Australia.*
- Environmental Protection Authority (2006b) *Guidance Statement No. 10 - Level of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*
- Environmental Protection Authority (2008b) *Guidance Statement No. 19 - Environmental Offsets - Biodiversity.*

7.1.4 Potential Impacts

The proposed development footprint comprises approximately 1.28 ha and has been sited to minimise the amount of vegetation to be cleared, particularly the nominated PEC. The proposed development will result in the clearing of 9020 m^2 of vegetation and retention of 2.83

ha of vegetation across the remainder of the site. The proposed retention represents 75% of the 3.73 ha of vegetation that occurs on-site.

The vegetation to be cleared includes 4352 m^2 of the nominated PEC and 4667 m^2 of dryland vegetation. The area of nominated PEC to be cleared represents 13% of the total area of the nominated PEC on the site which means that 87% of the nominated PEC on the site will be retained.

The total area of clearing represents 9020 m^2 or 0.01% of the 3198 ha of the Abba Vegetation Complex remaining.

The proposed development will potentially impact on two of the 20 Priority 4 *Eucalyptus rudis* subsp. *cratyantha* trees that occur on-site.

An existing drainage channel occurs in the dampland vegetation. Development of the site could potentially alter the hydrology of the area of vegetation to be retained, adversely impacting on the nominated PEC.

The area of retained vegetation may be impacted by the 'edge effect'. In general terms, the longer the edge, the larger the area within the retained vegetation that is likely to be subject to disturbance as a result in the change of land use. The proposed development includes internal roadways and parking areas along the northern and eastern boundaries abutting the native vegetation, and proposed landscaping will comprise native species endemic to the area. Known edge effects include invasion of natural vegetation by weeds due to disturbance and improving access to pest animals such as foxes and feral cats that tend to move and harbour along roads and tracks. Given that the native vegetation found within Armstrong Reserve is predominantly in a very good to excellent condition with a dense understorey despite being in the middle of Old Dunsborough, this would indicate that the vegetation has a high level of resilience. Edge effects from the proposed development are not expected to increase due to the vegetation structure and future management.

Observations made during the Level 2 Flora and Vegetation Survey (**Appendix 3**) suggest that *Phytophthora cinnamomi* dieback may be present on-site, and it has been inferred that this has either spread passively from earlier infestations in Marri Reserve or with soil and garden waste introduced from nearby properties. While it was noted that many characteristic species of the site are dieback resistant (e.g. *Agonis flexuosa, Corymbia calophylla, Eucalyptus rudis, Meleleuca preissiana* and *Viminaria juncea* (Groves *et al*., 2009a) several characteristic subdominant species are considered to be susceptible to the disease including *Allocasuarina fraseriana, Banksia attentuata, B. littoralis, Eucalyptus marginata, Jacksonia furcellata* and *Xanthorrhoea* spp. (Groves *et al*., 2009b), and that these will eventually become unhealthy and usually die, permanently altering the vegetation structure and species composition in the area (Ecoscape, 2010).

7.1.5 Management Measures

The Proponent has liaised with the City of Busselton with respect to the long-term management options available for the remaining 70% of the site located outside of the proposed development footprint. During this process, the City has advised the Proponent that it would be willing to retain the vesting of the remainder of the site and manage it as

Conservation POS (P. Malavisi pers. comm. 6 August 2012). The planning process that will be entered into should State and Commonwealth environmental approvals be granted, will involve the rezoning followed by subdivision/amalgamation of the affected lots. Currently Lot 257 is identified as 'Recreation' under the City of Busselton's TPS No. 20. The City of Busselton has indicated that with respect to the area of Lot 257 that is outside of the proposed development footprint, the City will recommend to the Department of Lands that the legal use be changed from 'Recreation' to 'Landscape Protection' (P. Malavisi pers. comm.). The area subject to 'Landscape Protection' will be managed in perpetuity by the City of Busselton. Furthermore, the City has advised that it has no objection to the amalgamation of the lots south of Lot 258 and that this process will be dealt with by the Department of Lands. The proposed development footprint will continue to be identified on the Scheme map as 'Recreation' until such time that the City has an omnibus amendment which will then likely change the identification in the Scheme to 'Special Purpose Zone – Aged Persons' (P. Malavisi, pers. comm. 6 August 2012).

To assist the City manage the reserve for conservation purposes, the Proponent commits to preparing an Environmental (Vegetation and Fauna) Management Plan (EMP) for the site in consultation with and to the satisfaction of the DEC, DSEWPaC and the City of Busselton. The Proponent will be responsible for implementing the EMP for a period of three (3) years after which the City of Busselton will then take over the responsibility for implementation.

The principal objectives of the EMP will be to:

1. Protect the conservation values within the remainder of the site that is outside of the proposed development footprint to be set aside as Conservation POS vested in the City of Busselton; and

2. Conserve and enhance the natural habitat of the Western Ringtail Possum wherever practicable outside of the building footprint associated with the proposed development footprint.

The EMP will include but not be limited to:

- Identification and protection of Black Cockatoo and Western Ringtail Possum habitat and significant trees that are identified following the detailed engineering/architectural design phase can be retained within the proposed development footprint;
- Identification and protection of Black Cockatoo and Western Ringtail Possum habitat and significant trees that are to be retained outside of the proposed development footprint;
- Clearing protocols to protect Black Cockatoo and Western Ringtail Possums both prior to and during clearing and construction activities;
- A Western Ringtail Possum monitoring program to assess:
  - Derive a quantitative estimate of the population size within the site; and
  - Assess the immediate and long-term effects from the proposed development on the population within the site
- Weed eradication program;
- Detailed planting/landscaping plan for the proposed development footprint;
- Revegetating degraded areas within the site with appropriate indigenous flora;
- Soil and plant source material hygiene;
- Controlling pedestrian and vehicle access to the site;

- Water conservation principles;
- Education program including signage, pamphlets and other means, to engage the facility's residential community about the function of the Western Ringtail Possum and its habitat requirements;
- Responsibilities for implementation;
- Monitoring criteria to determine the success of the revegetation and weed eradication program;
- Progress and compliance reporting; and
- Timing and implementation schedule that specific management measures will occur on-site.

A Fire Management Plan (FMP) has been prepared by FirePlan WA (2012)in consultation with and to the satisfaction of the City of Busselton, FESA and the DEC.

The principal objectives of the FMP are to:

1. Manage the potential impacts of a bush fire on the proposed development site.

2. To reduce the threat to residents in the event of a fire within or near the proposed development by providing a hazard separation zone between remnant bushland and the proposed development.

The bushfire protection requirements, as per the *Planning for Bushfire Protection Guidelines* (Western Australian Planning Commission and the Fire and Emergency Services Authority, 2010), are contained within the proposed development footprint, as identified on **Figure 12**, and do not encroach upon any area that is proposed to be retained in permanent conservation.

The FMP incorporates fire management methods such as:

- Strategic firebreak system;
- Dwelling construction and setbacks;
- Building protection zone;
- Hazard separation zone;
- Hazard reduction; and
- Provision of adequate water for fire fighting purposes.

The FMP is included as **Appendix 7**.

To prevent the further spread of *Phytophthora cinnamomi* dieback, a Dieback Management Plan will be prepared and implemented to the specifications of the DEC Guidelines (Department of Conservation and Land Management, 2004).

To avoid any changes to the natural hydrology within the area of vegetation to be retained outside of the proposed development footprint, the Proponent will prepare and implement a Drainage Management Plan to the satisfaction of the City of Busselton.

7.1.6 Predicted Outcome

A total of 9020 m^2 of native vegetation will be cleared for the proposed development including 4352 m^2 of the nominated PEC "*Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area". Approximately 87% of the nominated PEC will be retained on the site and will be managed for conservation by the City of Busselton in accordance with an approved Environmental (Vegetation and Fauna) Management Plan. This is an improvement on the current unmanaged situation for the vegetation on the site.

At the vegetation complex level the proposed clearing of 9020 m^2 represents a very small percentage (0.01%) reduction in the amount of Abba Vegetation Complex remaining but will slightly increase the amount of this vegetation complex in a reserve managed for its conservation values.

The EPA's environmental objective for Flora and Vegetation will be achieved through restricting clearing to within the proposed development footprint and managing potentially adverse construction impacts through the implementation of a comprehensive EMP.

7.1.7 Environmental Management Commitment

The implementation of the proposal may result in clearing of up to 4352 m^2 of vegetation comprising a nominated PEC and proposes that this be compensated for by the provision of an 'offset package' as discussed in **Section 8.**

The proponent will prepare and implement an Environmental (Vegetation and Fauna) Management Plan to guide the long-term management of the area of vegetation to be retained on-site in Conservation POS.

The proponent will prepare and implement a Drainage Management Plan to protect the area of vegetation to be retained from any adverse changes in hydrology.

The EPA's environmental objective for Flora and Vegetation will be achieved through minimising the proposed development footprint and managing potentially adverse construction impacts through the implementation of a comprehensive EMP.

7.2 Specially Protected (Threatened) Fauna

7.2.1 Area of Assessment

The area of assessment includes the whole site as shown in **Figure 2**.

7.2.2 Environmental Objective

The EPA's objective for Specially Protected (Threatened) Fauna is *"to maintain the abundance, diversity, geographic distribution and productivity of fauna at the species and ecosystem levels through the avoidance or management of adverse impacts and through improvement in knowledge."* (Office of the Environmental Protection Authority, 2010b)

7.2.3 Relevant Legislation, Policy and Guidelines

- *Environmental Protection Act 1986*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Wildlife Conservation Act 1950*
- Environmental Protection Authority (2002) Position Statement No. 3 – *Terrestrial Biological Surveys as an Element of Biological Protection.*
- Environmental Protection Authority (2004b) Guidance Statement No. 56 – *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia.*
- Environmental Protection Authority (2006b) Guidance Statement No. 10 – *Level of Assessment for Proposals Affecting Natural Areas within the System 6 and Swan Coastal Plain Portion of the System 1 Region.*
- Environmental Protection Authority (2008a) Guidance Statement No. 19 – *Environmental Offsets – Biodiversity.*

7.2.4 Potential Impacts

The proposed development footprint is identified as being located within the Area 3 – Supporting Habitat (DEWHA, 2009a) and will require the removal of 9020 m^2 of Western Ringtail Possum habitat including 174 significant (*Agonis flexuosa* - Peppermint) trees.

Habitat loss and fragmentation through clearing of native vegetation are the major threats facing many Western Ringtail Possum populations (de Tores *et al.,* 2004). Loss of canopy connectivity, which is used by individual Western Ringtail Possum at the local level to access habitat patches, and loss of habitat corridors, which allow populations to remain connected to the landscape, can also have serious impacts on Western Ringtail Possum populations particularly in modified landscapes (DEWHA, 2009a).

Fragmentation of habitat linkages may cause Western Ringtail Possum individuals to descend to the ground more frequently thereby increasing their risk from ground predators such as foxes and cats (de Tores *et al.,* 2004). The proposed development design does not fragment existing habitat linkages, maintaining a linkage for Western Ringtail Possum to move between Armstrong Reserve and surrounding habitat areas.

Physical injury or fatality to fauna may occur during the vegetation clearing process and construction activities.

To determine whether the removal of potential habitat will have a significant impact on Black Cockatoo species, an evaluation of the *Draft referral guidelines for three threatened black cockatoo species* (DSEWPaC, 2011) has been undertaken as shown in **Table 16** (over the page).

TABLE 16
ASSESSMENT AGAINST THE DRAFT REFERRAL GUIDELINES (2011)

SIGNIFICANT IMPACT CRITERIA	BLACK COCKATOO HABITAT
Clearing of any known nesting tree	No evidence of past or present breeding or nesting was recorded from the site.
Clearing of any part or degradation of breeding habitat	11 potential nesting habitat trees were mapped on-site as part of a Western Ringtail Possum habitat survey. One suitable potential nesting hollow, identified as being suitable for Carnaby's Black Cockatoo (hollow 7), will be retained on-site. No evidence of past or present breeding or nesting was recorded from the site.
Clearing of more than 1 ha of quality foraging habitat	Approximately 9020m^2 of native vegetation, mainly *Agonis flexuosa,* is proposed to be cleared from within the development footprint. Approximately 2.41 ha of the site will remain uncleared and be protected through rezoning to 'Landscape Protection' within the relevant Town Planning Scheme.
Creating a gap of greater than 4 km between patches of habitat (breeding, foraging, or roosting)	The proposed development footprint is located directly opposite Marri Reserve, a C class reserve which comprises 9.3 ha of more extensive and better quality Black Cockatoo habitat.
Clearing or degradation of a known roosting site	No evidence of roosting activity by Black Cockatoos has been observed on-site.

The likely impact on potential Black Cockatoo within the proposed development footprint is therefore considered to be very limited.

7.2.5 Management Measures

Clearing of 9020m^2 of native vegetation from within the proposed development footprint will avoid any unnecessary clearing of significant trees wherever practicable but will be contingent upon final engineering and architectural design detail. Details of any potential Western Ringtail Possum or Black Cockatoo habitat trees to be retained within the proposed development footprint will be included within the EMP.

The area of vegetation to be retained outside of the proposed development footprint will be protected and managed as a Conservation POS and rezoned as 'Landscape Protection'. Discussions with the City of Busselton indicate that the City is willing to retain the vesting of the reserve and manage it for conservation and drainage purposes.

To assist the City manage the reserve for conservation purposes, the Proponent commits to preparing an Environmental (Vegetation and Fauna) Management Plan (EMP) for the site in consultation with and to the satisfaction of the DEC, DSEWPaC and the City of Busselton. The Proponent will be responsible for implementing the EMP for a period of three (3) years after which the City of Busselton will then take over the responsibility for implementation.

The principal objectives of the EMP will be to:

1. Protect the conservation values within the remainder of the site that is outside of the proposed development footprint to be set aside as Conservation POS vested in the City of Busselton; and

2. Conserve and enhance the natural habitat of the Western Ringtail Possum wherever practicable outside of the building footprint associated with the proposed development footprint.

The EMP will include but not be limited to:

- Identification and protection of potential Black Cockatoo and Western Ringtail Possum habitat and significant trees that are identified following the detailed engineering/architectural design phase can be retained within the proposed development footprint;
- Identification and protection of potential Black Cockatoo and Western Ringtail Possum habitat and significant trees that are to be retained outside of the proposed development footprint;
- Clearing protocols to protect Black Cockatoos and Western Ringtail Possums prior to and during clearing and construction activities;
- A Western Ringtail Possum monitoring program to assess:
  - Derive a quantitative estimate of the population size within the site; and
  - Assess the immediate and long-term effects from the proposed development on the population within the site
- Weed eradication program;
- Detailed planting/landscaping plan for the proposed development footprint;
- Revegetating degraded areas within the site with appropriate indigenous flora;
- Soil and plant source material hygiene;
- Controlling pedestrian and vehicle access to the site;
- Water conservation principles;
- Education program including signage, pamphlets and other means, to engage the residential community about the function of the Western Ringtail Possum and its habitat requirements;
- Responsibilities for implementation;
- Monitoring criteria to determine the success of the revegetation and weed eradication program;
- Progress and compliance reporting; and
- Timing and implementation schedule that specific management measures will occur on-site.

Management measures designed to protect *in situ* Western Ringtail Possum and existing vegetation that is to be retained both inside and outside of the proposed development footprint in the Western Ringtail Possum habitat will include, but not be limited to:

i) GPS coordinates of all trees identified to be retained will be recorded and mapped;
ii) The site surveyor clearly marking all vegetation that is to be retained with high visibility flagging tape/star pickets prior to commencement of clearing. Tape/star pickets will remain *in situ* for the duration of the clearing works so that these areas are visible to the civil works contractor; and
iii) Prior to the commencement of clearing the fauna specialist will accompany the clearing contractor on a site walkover to identify areas of vegetation marked for clearing and retention and to agree on a process and timetable for clearing each of the lots.

iv) All clearing will be undertaken in keeping with the clearing protocols recommended in the DEC's *Procedures to Minimise Risk to* Western Ringtail Possum*s during Vegetation Clearing and Building Demolition* (2009) document (refer to **Appendix 9**). The primary objective of these guidelines is to ensure that clearing is undertaken in a manner that avoids Western Ringtail Possum mortalities and allows any resident Western Ringtail Possum to voluntarily relocate/mobilise to areas of suitable habitat that are not being cleared (both within and adjacent to the proposed development area).

v) Stockpile practices: to minimise any accidental injury or death of Western Ringtail Possum personnel involved in the removal or disposal of stockpiles will be made aware of and be prepared for the potential presence of Western Ringtail Possum. If vegetation is to be stockpiled on-site, then it is preferable to place it in cleared areas as far as possible from retained remnant vegetation.

vi) If buildings are to be cleared then prior to clearing works commencing, then the roof and ceilings on the old building to be demolished, should be removed 5-7 days prior to demolition to allow adequate time for dispersal of any *in situ* Western Ringtail Possum.

vii) Site workers will be advised through a site induction program about the potential presence of Western Ringtail Possum and to minimise potential injuries to Western Ringtail Possum during construction works. The DEC's Blackwood District Office will be immediately notified should any Western Ringtail Possum be inadvertently injured during construction works.

A Revegetation and Rehabilitation Plan (RRP) will be developed in consultation with the City of Busselton and DSEWPaC and implemented for the offset site (Reserve 31645, Caves Road Dunsborough) proposed for revegetation and rehabilitation. The Proponent will be responsible for the implementation of the approved RRP for a period of three (3) years after which the City of Busselton will then take over the responsibility for implementation.

The RRP will include but not be limited to:

- Site details (including maps and coordinates);
- Revegetation principles:
  - Methodology
  - Weed control
  - Soil preparation
  - Pest management
  - Planting schedule
  - Species Selection
- Revegetation details;
- Responsibilities for implementation;
- Monitoring criteria to determine the success of the revegetation program;
- Progress and compliance reporting; and
- Timing and implementation schedule that specific management measures will occur at the offset site.

7.2.6 Predicted Outcome

Approximately 9020 m^2 of Western Ringtail Possum habitat will be cleared within the proposed development footprint. Conservation value habitat comprising approximately 2.83 ha located

outside of the proposed development footprint will be retained, protected and enhanced in a reserve managed for its conservation values.

Conservation value habitat located on-site outside of the proposed development footprint will be retained, protected and enhanced through the implementation of an Environmental (Vegetation and Fauna) Management Plan.

No fauna species of conservation significance will cease to exist neither will their conservation status be adversely affected as a result of the implementation of the proposal.

It is highly unlikely that the implementation of the proposal will have an adverse impact on fauna of conservation significance at a regional scale and those of a local scale are considered to be acceptable with rehabilitation of disturbed areas and the potential for environmental benefits from proposed offsets.

At a local scale the availability of Western Ringtail Possum habitat over the short-term will decrease, however this will be compensated for by the potential for environmental benefits from proposed offsets including the rehabilitation of City of Busselton's Reserve 31645 with the planting of 1.8 ha of understorey vegetation and 700 native Peppermint trees. Reserve 31645 is a C class reserve zoned 'Recreation' located on Caves Road, Dunsborough and abuts the southern boundary of Peron Reserve a known Western Ringtail Possum habitat area. The rehabilitation of Reserve 31645 will result in infill of a fragmented habitat in this part of Dunsborough.

No evidence of roosting, nesting or foraging by Black Cockatoos was observed within the proposed development footprint and it is anticipated therefore that there will be no significant impact upon either Black Cockatoo habitat or populations as a result of clearing the proposed development footprint.

The EPA's environmental objective for Specially Protected (Threatened) Fauna will be achieved through restricting clearing to within the proposed development footprint and managing potentially adverse construction impacts through the implementation of a comprehensive EMP.

7.2.7 Environmental Management Commitment

The Proponent acknowledges that implementation of the proposal may result in clearing of up to 9020 m^2 of vegetation comprising Western Ringtail Possum habitat and proposes that this be compensated for by the provision of an 'offset package' as discussed in **section 8.**

The Proponent will prepare and implement an Environmental (Vegetation and Fauna) Management Plan to guide the long-term management of the area of vegetation to be retained on-site in Conservation POS.

The Proponent will prepare and implement a Revegetation and Rehabilitation Plan to guide the proposed revegetation, rehabilitation and long-term management of the offset site located at Reserve 31645 Caves Road, Dunsborough.

The Proponent will prepare and implement a Drainage Management Plan to protect the area of vegetation to be retained from any adverse changes in hydrology.

7.3 Soil Quality

7.3.1 Area of Assessment

The area of assessment includes Lots 111, 115, 116 and 117 Naturaliste Terrace, Dunsborough

7.3.2 Environmental Objective

The EPA's objective for Soil Quality is *"to ensure the rehabilitation achieves an acceptable standard compatible with the intended land use, and consistent with appropriate criteria."* (Office of the Environmental Protection Authority, 2010b)

7.3.3 Relevant Legislation, Policy and Guidelines

- *Environmental Protection Act 1986*
- *Contaminated Sites Act 2003*
- DEC Contaminated Sites Management Series, specifically DEP (2001) *Reporting of Site Assessments*
- DEC (2011) Acid Sulfate Soils Guideline Series – *Treatment and management of soils and water in acid sulfate soils landscapes*

7.3.4 Potential Impacts

The nature of the contaminants likely to be found in soils found on-site is such that the predominant exposure pathways of concern are through inhalation and ingestion. For exposure to occur, a complete pathway must exist between the source of contamination and the receptor (i.e. the person or ecosystem components potentially affected by the contamination).

Several areas of environmental concern (AECs) were identified during the PSI that if left *in situ* could impact on the well-being of prospective residents of the proposed development

7.3.5 Management Measures

Through discussions with their contaminated sites environmental consultant (Coffey Environments) it is anticipated that as a minimum the following proposed sampling and analysis will be undertaken on-site as described below. Instead of a formal sampling and analysis plan (SAP), the sampling and analysis strategy described below will fulfil the SAP intent unless otherwise recommended by the Contaminated Sites Auditor (to be appointed).

The proposed DSI, to be conducted in accordance with the DEC Contaminated Sites Management Series (Department of Environment and Conservation, 2010), will establish the nature and extent of contamination and include an assessment of potential risks to human health and ecological receptors and provide a strategy for remediation and validation.

The DSI scope of works will broadly comprise the following elements:

- Undertake a Stage 2 DSI of the site in accordance with the DEC guidelines.

- Prepare a Stage 2 DSI Report in accordance with the DEC Contaminated Site Management Guidelines and specifically the guideline '*Reporting of Known or Suspected Contaminated Sites'* (2006), detailing the potential ecological and human health risk and the requirements for further intrusive (sampling) investigations.

7.3.5.1 Field Investigation

The proposed field investigation program is summarised as follows:

- For **AEC 1** (concrete ramp), it is proposed that two soil bores will be installed on a targeted (judgemental) basis in the centre of the ramp. Soil bores will be extended to a minimum of 1.0 m below ground level (mBGL) or deeper subject to the depth of the natural soil.
- For **AEC 2** (large grey shed), it is proposed that five soil bores will be installed on a systematic (grid) basis and extend down to a minimum of 1.0 mBGL or deeper subject to the depth of the natural soil. Since AEC2 has an estimated footprint of ~300m2, the proposed number of soil bores is consistent with the minimum sampling densities outlined in DEC (2001) *Development of Sampling and Analysis Programs.*
- For **AEC3** (sheen observed on surface water), it is proposed to collect surface water and sediment samples on a targeted (judgemental) basis including a minimum of one pair of surface water/sediment samples along the upstream site boundary, one surface water/sediment sample pair midway through the site and one surface water/sediment sample pair along the downstream site boundary. Specific sample locations will be biased towards areas where there is field evidence of potential impact. Note, the collection of surface water samples is subject to there being sample volume available on the day of the fieldwork.
- Soil samples will be collected from the top 0.1 mBGL (below the concrete base), and nominally at 0.5 m intervals until natural soil or groundwater is intersection or to a minimum depth of 1 mBGL. Additional soil samples will be collected for each distinct change in lithology.
- Sediment grab samples will be collected at the interface with the sediment sample depth limited to that required to obtain a satisfactory sample.
- Selected soil samples from each soil bore and all surface water samples will be submitted for laboratory analysis. Samples will be submitted under chain of custody procedures to a NATA accredited analytical laboratory and tested for a suite of analytes.
- Soil bores and sediment grab samples will be logged using the Unified Soil Classification System (USCS) and an electronic geological log will be produced using gINT software.
- Surface water samples will also be submitted under chain of custody procedures to a NATA accredited analytical laboratory and tested for a suite of analytes.

7.3.5.2 Laboratory Analytical Suites (Soil)

Proposed analytical schedules take into account those COPCs identified in the PSI and professional judgement. Proposed analysis is as follows:

AEC1 (four samples, two from each soil bore in the centre of the ramp)
- Total recoverable hydrocarbons (TRH)
- Benzene, toluene, ethylbenzene and xylenes (BTEX)
- Metals (eight priority metals)

- Polyaromatic hyddrocarbons (PAHs)/Phenols
- Volatile Halogenated Compounds (VHCs)
- Metal leachate analysis (eight priority metals pH 7) (to assist in waste classification if required)

AEC2 (10 samples, two from each soil bore, except where stated otherwise)
- TRH
- BTEX
- Metals (eight priority metals)
- Polychlorinated biphenyls (PCBs)
- Organochlorine pesticides (OCPs)/organophosphate pesticides (OPPs)
- Metal leachate analysis (pH 7) (to assist in waste classification if required)
- VHCs (two samples only or approximately 20%, based on field evidence)
- Herbicides (two samples only or approximately 20%, based on field evidence)

7.3.5.3 Laboratory Analytical Suites (Surface Water and Sediment)

Proposed analytical schedules take into account those COPCs identified in the PSI and professional judgement. Proposed analysis is as follows:

AEC3 (three samples, one surface water and one sediment sample from each location)
- TRH
- BTEX
- Metals (eight priority metals)
- PAHs/Phenols
- OCPs/OPPs and herbicides
- Anion/Cation screen (surface water sample only)
- VHCs

7.3.5.4 DSI Report

A detailed interpretative report will be produced in conformance with the elements recommended in DEP (2001) *Reporting on Site Assessments* and submitted to the Contaminated Sites Auditor for review.

7.3.5.5 Remediation and Validation Management

In the event that sampling and analysis indicates that remediation is required to be undertaken, remedial options will be considered in accordance with the EPA's Guidance Statement for Remediation Hierarchy for Contaminated Land (Environmental Protection Authority, 2000) in consultation with a Contaminated Site's Auditor and the DEC's Contaminated Sites Branch. A Remediation and Validation Management Plan will be prepared upon the advice of the Site Auditor and the DEC.

7.3.6 Predicted Outcome

Based on the inferred extent and probably sources of contamination, and the remediation and validation that is proposed be implemented, it is considered that the proposed rehabilitation

will achieve an acceptable standard compatible with the intended land use, and consistent with appropriate criteria.

The EPA's environmental objective for Soil Quality will be achieved through managing the implementation of a DSI and remediation and validation management plan should this be required.

7.3.7 Environmental Management Commitments

Should the DSI identify areas of contaminated soil in excess of EIL criteria, a Site Remediation and Validation Plan will be prepared and implemented by the Proponent in consultation with the Contaminated Sites Auditor and in accordance with relevant DEC Guidelines for the remediation of contaminated land (Department of Environment and Conservation, 2010b).

Upon conclusion of remediation works, a detailed remediation assessment report will be prepared by the Proponent's environmental consultant and reviewed by the Auditor, prior to being submitted to the DEC's Contaminated Sites Branch. The report will provide detailed information on:

- the remediation strategy implemented;
- the results of validation and stockpile sampling; and
- details of the management of all contaminated material.

8. ENVIRONMENTAL OFFSET STRATEGY

8.1 Introduction

'Environmental offsets' are broadly understood to mean measures (actions) taken by developers to compensate for the adverse impacts of their developments on the environment (DSEWPaC, 2011). Both the Western Australian EPA and the DSEWPaC recognise the need for the provision of environmental offsets by Proponents should studies indicate that a development will result in the loss of a significant element.

Offsets can be categorised into 'direct' and 'indirect' offsets. Direct offsets provide on-ground protection and improved conservation outcomes and involve the following attributes (DSEWPaC, 2011):

- the acquisition of land for enduring protection through inclusion in the conservation estate
- maintenance or improvement of that land through positive conservation actions targeted towards the protected matter.

These actions may include protecting existing good or better quality habitat, rehabilitation of existing vegetation in poor condition or revegetation of environmentally degraded land.

Indirect offsets are a range of other measures that improve our knowledge, understanding and management of environmental values leading to improved conservation outcomes for the impacted protect matter (DSEWPaC, 2011), and may include:

- implementing priority actions outlined in the relevant recovery plan;
- enhancing habitat quality or reducing threats to the protected matter on a site that is not part of the direct offset, for example by removing invasive species; and
- contributing to relevant research or education programs.

The EPA's Guidance Statement 19: *Environmental Offsets – Biodiversity* (2008a) addresses environmental offsets for development and planning projects outlining the EPA's expectations in developing or reviewing options for environmental offsets associated with development proposals subject to environmental impact assessment, such as is the case with the proposed development of Armstrong Reserve.

The draft *EPBC Act Environmental Offsets Policy* (2011) outlines the Australian Government's proposed framework on the use of environmental offsets under the EPBC Act 1999 including when they can be required, how they are determined and the framework under which they operate. The draft Environmental Offsets Policy has four key aims, which are to:

1. Ensure the efficient, effective, transport, proportionate, scientifically robust and reasonable use of offsets under the EPBC Act.
2. Provide proponents, the community and other jurisdictions with greater certainty and guidance on how offsets are determined and applied under the EPBC Act.
3. Deliver improved environmental outcomes by consistently applying offsets policy.
4. Explain the Government's position on a range of issues include:
   - When it is appropriate to consider offsets as part of a project.

- The appropriate nature and scale of offsets.
- The use of market-based instruments for the delivery of offsets.

In order to mitigate residual impacts on key environmental assets (Western Ringtail Possum habitat and a nominated PEC) that are likely to result from the proposal to develop a 1.28 ha portion of Armstrong Reserve, the Proponent is committed to providing appropriate offsets that will enable long-term environmental benefits to be afforded to these assets.

The Environmental Offset Strategy has been prepared in consultation with the OEPA and the following EPA guidelines:

- Environmental Protection Authority (2006a) *Environmental Offsets* Position Statement No. 9.
- Environmental Protection Authority (2008a) Guidance Statement No. 19 – *Environmental Offsets – Biodiversity.*
- Department of Sustainability Environment, Water, Population and Communities (2011) *EPBC Act Environmental Offsets Policy Consultation Draft*.

In order to minimise the impact on the vegetation found on-site, the size of the proposed development footprint has been significantly scaled back from what was originally proposed in the EPBC referral submitted to DSEWPaC in 2007 that showed 100% of the site being developed (**Figure 5a**). Following consultation with the DEC's Blackwood District Office in 2010 regarding whether a TEC potentially occurred within the northern area of Lot 257, the Proponent proposed further reduction of the area of the proposed development footprint to 2.16 ha or 50% of the site (**Figure 5b**).

Through the preparation of the ESD and ongoing liaison with the OEPA and the DEC, the Proponent was advised that the proposed development footprint be focussed on utilising the existing cleared areas on Lots 111, 115-117 and 257 as the basis for the footprint. In keeping with this advice, the Proponent has further reduced the scale of the proposed development footprint so that it now comprises approximately 1.28 ha or 30% of the site (**Figure 2**).

The proposed development footprint, as shown on **Figure 6,** has been reduced to what the Proponent considers is the minimum feasible size permitting the construction of an aged care facility that can include all of the elements that the local Dunsborough community has indicated are required be provided for the community. The proposed development footprint is of a sufficient size that the proposed development will be able to include an adult day centre and associated community meeting rooms and a number of independent living (retirement) units whose construction will be vital in enabling the long-term funding of the facility.

8.2 Western Ringtail Possum Habitat

While approximately 4332 m^2 of the 1.28 ha proposed development footprint has been historically cleared, 9020 m^2 of vegetation will need to be cleared for the proposed development to be constructed. The 9020 m^2 comprises Western Ringtail Possum habitat.

8.2.1 Offset Ratios

With respect to Western Ringtail Possum habitat, the DSEWPaC's definition of remnant habitat patches relates to the entire habitat patch. Correspondence provided by the DSEWPaC to the Proponent during the preparation of the ESD advised that while each project is assessed on a case by case basis with respect to indicative outcomes, that as a guide the following criteria apply to the amount of remnant habitat within the project area would need to be achieved for a proposed action affecting Western Ringtail Possum habitat within the Bunbury to Dunsborough region to be considered acceptable:

- If project clears between 0% and 20% of the remnant habitat onsite, proponents must, in addition to retaining 80% of the habitat, procure a 1:1 onsite mitigation or offset for the area that has been cleared. This onsite mitigation and/or offset must be protected in perpetuity and must be located within one of the important areas.
- If project clears between 20% and 50% of the remnant habitat onsite, proponents must, in addition to retaining between 50% and 80% of the habitat, procure a 2:1 onsite mitigation or offset for the area that has been cleared. This onsite mitigation and/or offset must be protected in perpetuity and must be located within one of the important areas.
- If project clears between 50% and 75% of the remnant habitat onsite, proponents must, in addition to retaining between 25% and 50% of the habitat, procure a 3:1 onsite mitigation or offset for the area that has been cleared. This onsite mitigation and/or offset must be protected in perpetuity and must be located within one of the important areas.
- If project clears more that 75% of the remnant habitat onsite, it is strongly recommended that the proponent consider re-design of the project as it is likely that the Department would consider recommending to the Minister that the project not be approved.

In addition, DSEWPaC has advised that while meeting the above outcomes involving replanting or protection of existing habitat, the following amount of replanting of understorey and Peppermint trees should be achieved:

- 1:1 for all understorey that is removed
- 1:1 for any Peppermint trees cleared that are between 10 – 50 mm DBH
- 5:1 for any Peppermint trees cleared that are between 51 – 1000 mm DBH
- 10:1 for any Peppermint trees cleared that are >1001 mm DBH

During the Level 2 Fauna Survey, a Western Ringtail Possum habitat tree survey on the portion of the site to the east of the drainage reserve (i.e. Lot 258) was carried out in order to identify the number of trees and quantity of habitat suitable for Western Ringtail Possum. The locations of Peppermint trees (*Agonis flexuosa*) were recorded using a DGPS (0.5-1 m accuracy) and diameter at breast height (DBH) was measured using a DBH tape measure and recorded (Ecoscape, 2012).

As a result of the survey the following findings with respect to Western Ringtail Possum habitat were determined:

1. The entire 9020 m^2 that is proposed to be cleared from within the proposed development footprint has been identified as Western Ringtail Possum habitat (Ecoscape, 2012).

2. A total of 294 Peppermint trees were recorded east of the drainage reserve of which 174 Peppermint trees were found to be occurring within the proposed development footprint (**Figure 10**).

The number of Peppermint trees within each DBH size class and the subsequent number of trees to offset are summarised in **Table 17.**

TABLE 17
WESTERN RINGTAIL POSSUM HABITAT OFFSET REQUIREMENTS

UNDERSTOREY HABITAT			
Area of Understorey Impacted	**Area of Habitat Impacted**	**Offset Ratio**	**Area to Offset (ha)**
9020 m^2	9020 m^2	2:1	1.8
SIGNIFICANT TREE HABITAT			
DBH Size (mm)	**Number of Trees**	**Offset Ratio**	**Number to Offset**
10-50	45	1:1	45
51-1000	127	5:1	635
>1001	2	10:1	20
Total	**174**		**700**

8.2.2 Offset Strategy

With respect to Western Ringtail Possum habitat, the Environmental Offset Strategy is proposed to include the following:

A. Rehabilitation of an Off-site Location

The Proponent is committed to implementing a program of Peppermint tree and understorey plantings at an off-site location comprising approximately 1.8 ha ensuring that the number of Peppermint tree planted matches the offset number (i.e. 700) as a minimum. The plantings will be installed on 'secure' land in an area where it is considered the rehabilitation will maximise linkage opportunities for Western Ringtail Possum between known habitat areas.

The Proponent has liaised with the City of Busselton in order to identify City Reserves within the Dunsborough area that would be suitable and available for potential rehabilitation with 1.8 ha of understorey vegetation and 700 Native Peppermint trees that are required to be offset. The City has identified Reserve 31645 as an area suitable for planting of Western Ringtail Possum habitat (Will Oldfield, Environmental Planning Coordinator, 8 June 2012, pers. comm.) Information pertaining to Reserve 31645 is shown in **Appendix 8**. Reserve 31645 is a C class reserve zoned for 'Recreation' located on Caves Road Dunsborough abutting the southern boundary of Person Reserve, a

known Western Ringtail Possum habitat area. The site is located in an area identified as 'Supporting Habitat' on Figure 1 of the EPBC Act Policy Statement 3.10: Significant impact guidelines for the vulnerable western ringtail possum *(Pseudocheirus occidentalis)* in the southern Swan Coastal Plain, Western Australia (DEWHA, 2008). The goal in this area is to improve habitat quality and connectivity on the plains and to the hinterland thus increasing opportunities for foraging, breeding and dispersal.

The site was identified by the City of Busselton as a reserve suitable for planting with Western Ringtail Possum habitat due to its connectivity with Peron Reserve. The site is located within the 'Western Ringtail Possum Habitat Protection Zone' identified in the City of Busselton's Proposed Scheme Amendment 146 to the Shire of Busselton TPS No. 3 that provides for the identification of areas on the scheme map and a new Clause 34 which details incentive and control provisions in relation to Western Ringtail Possum habitat protection. The proposed scheme amendment is an integral part of the City of Busselton's approach to the protection and enhancement of valuable Western Ringtail Possum habitat within the City ensuring that the long-term habitat benefits are maximised (City of Busselton, 2012). The revegetation of the offset site will result in an area of infill in a fragmented habitat area.

The City has advised that it is not pursuing changing the zoning status of the reserve as it requires the reserve to be available to provide amenity for the community and will therefore remain a C class reserve zoned 'Recreation' (Will Oldfield, pers. comm. 8 June 2012).

B. Revegetation and Rehabilitation Management Plan

A Revegetation and Rehabilitation Plan (RRP) will be developed in consultation with the DEC, City of Busselton and DSEWPaC and implemented for the offset site (Reserve 31645, Caves Road Dunsborough) proposed for revegetation and rehabilitation. The Proponent will be responsible for the implementation of the approved EMP for a period of three (3) years after which the City of Busselton will then take over the responsibility for implementation.

The RRP will include but not be limited to:

- Site details (including maps and coordinates);
- Revegetation principles:
  - Methodology
  - Weed control
  - Soil preparation
  - Pest management
  - Planting schedule
  - Species Selection
- Revegetation details;
- Responsibilities for implementation;
- Monitoring criteria to determine the success of the revegetation and weed eradication program;
- Progress and compliance reporting; and
- Timing and implementation schedule that specific management measures will occur at the offset site.

C. Assessment of the Immediate and Long-term Effects of Development

Western Ringtail Possum monitoring currently being undertaken by the majority of environmental consultants generally includes a targeted search for Western Ringtail Possum using spotlighting for individuals at night and actively searching for dreys, tree hollows and scats during the day and recording these with GPS.

In consultation with staff from the DEC Science Division, the University of Western Australia (UWA) and Ecoscape, a Western Ringtail Possum monitoring program has been prepared to:

1) Derive a quantitative estimate of the Western Ringtail Possum population size within Armstrong Reserve; and
2) Assess the immediate and long-term effects, from the development on the Western Ringtail Possum population within the reserve.

Distance sampling surveys (discussed in **Section 6.12.2**) within the retained vegetation found on-site will be repeated twice annually for three years following commencement of vegetation clearing and building demolition for the proposed development. The surveys will use the series of semi-permanent transects established during the Level 2 Fauna Survey as shown as **Figure 9**. The monitoring program requirements will be contained within the EMP.

8.3 Nominated PEC

Approximately 4352 m^2 of the 9020 m^2 of native vegetation within the proposed development footprint that is required to be cleared for the proposed development to be constructed comprises the nominated PEC as mapped by the DEC (**Figure 8**).

Priority 1 Ecological Communities are "Poorly-known ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 ha occurrences or a total area of ≤ 100ha) (Department of Environment and Conservation, 2010a).

8.3.1 Offset Ratios

Table 18 identifies the extent of vegetation and nominated PEC found within the site and the proposed development footprint and the relative proportions.

TABLE 18
AREA AND PROPORTION OF PROPOSED DEVELOPMENT FOOTPRINT CONTAINING NOMINATED PRIORITY ECOLOGICAL COMMUNITY (PEC)

Area of vegetation found on-site	**37361 m^2**
Area of PEC found on-site (based on DEC mapping)	**32197 m^2**
Area of proposed development footprint	**12874 m^2**
Area of vegetation impacted by proposed development footprint	**9020 m^2**
Proportion of site vegetation proposed to be cleared	**24%**
Area of PEC impacted by proposed development footprint	**4352 m^2**
Proportion of site's PEC proposed to be cleared	**13%**

Through discussions with the OEPA, the Proponent understands that there are currently no adopted offset ratios stipulated by the EPA for PECs. Given that the nominated PEC found on-site is thought to only occur in the Dunsborough-Eagle Bay area ("*Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area"), providing direct offsets on a better than like for like basis for mitigating residual impacts would therefore be difficult.

8.3.2 Offset Strategy

The Proponent has actively sought to minimise the impact of the proposed development on the site's vegetation and in particular on the PEC by reducing the proposed development footprint from what was initially 100% of the site (as identified in the EPBC referral), to the current proposal which is approximately 30% of the site.

The Proponent has liaised with the City of Busselton with respect to the long-term management options available for the remaining 70% of the site located outside of the proposed development footprint. During this process, the City has advised the Proponent that it would be willing to retain the vesting of the remainder of the site and manage it as Conservation POS (P. Malavisi pers. comm.). The planning process that will be entered into should State and Commonwealth environmental approvals be granted, will involve the rezoning followed by subdivision/amalgamation of the affected lots. Currently Lot 257 is identified as 'Recreation' under the City of Busselton's TPS No. 20. The City of Busselton has indicated that with respect to the area of Lot 257 that is outside of the proposed development footprint, the City will recommend to the Department of Lands that the legal use be changed from 'Recreation' to 'Landscape Protection' (P. Malavisi pers. comm.). Furthermore, the City has advised that it has no objection to the amalgamation of the lots south of Lot 258 and that this process will be dealt with by the Department of Lands. The proposed development footprint will continue to be identified on the Scheme map as 'Recreation' until such time that the City has an omnibus amendment which will then likely change the identification in the Scheme to 'Special Purpose Zone – Aged Persons' (P. Malavisi, pers. comm.).

The Proponent proposes that the following indirect or support offsets be provided to ensure the objectives of the strategy are met:

A. Preparing and implementing an Environmental (Vegetation and Fauna) Management Plan (EMP) for the site to the satisfaction of the DEC, DSEWPaC and the City of Busselton. The Proponent will be responsible for the implementation of the approved EMP for a period of three (3) years after which the City of Busselton will then take over the responsibility for implementation.

The EMP will include, but not be limited to:

- Identification and protection of potential Black Cockatoo and Western Ringtail Possum habitat and significant trees that are identified following the detailed engineering/architectural design phase can be retained within the proposed the development footprint;

- Identification and protection of potential Black Cockatoo and Western Ringtail Possum habitat and significant trees that are to be retained outside of the proposed the development footprint;
- Clearing protocols to protect Black Cockatoo and Western Ringtail Possums both prior to and during clearing and construction activities;
- A Western Ringtail Possum monitoring program to assess:
  a) Derive a quantitative estimate of the population size within the site; and
  b) Assess the immediate and long-term effects from the proposed development on the population within the site.
- Weed eradication program;
- Detailed planting/landscaping plan for the proposed development footprint;
- Revegetating degraded areas within the site with appropriate indigenous flora;
- Soil and plant source material hygiene;
- Controlling pedestrian and vehicle access to the site;
- Water conservation principles;
- Education program including signage, pamphlets and other means, to engage the facility's residential community about the function of the Western Ringtail Possum and its habitat requirements;
- Responsibilities for implementation;
- Monitoring criteria to determine the success of the revegetation and weed eradication program;
- Progress and compliance reporting; and
- Timing and implementation schedule that specific management measures will occur on-site.

B. A Fire Management Plan has been by FirePlan WA (2012) has been prepared in consultation with and to the satisfaction of the City of Busselton, FESA and the DEC.

The bushfire protection requirements, as per the *Planning for Bushfire Protection Guidelines* (Western Australian Planning Commission and the Fire and Emergency Services Authority, 2010), are contained within the proposed development footprint and do not encroach upon any area that is proposed to be retained in permanent conservation (refer to **Figure 12**).

The FMP incorporates fire management methods such as:

- Strategic firebreak system;
- Dwelling construction and setbacks;
- Building protection zone;
- Hazard separation zone;
- Hazard reduction; and
- Provision of adequate water for fire fighting purposes.

C. To avoid any changes to the natural hydrology within the area of vegetation to be retained outside of the proposed development footprint, the proponent will prepare and implement a Drainage Management Plan on-site to the satisfaction of the City of Busselton.

D. To prevent further spread of *Phytophthora cinnamomi* dieback within Armstrong Reserve, a Dieback Management Plan will be prepared and implemented to the specifications of the DEC Guidelines.

9. ENVIRONMENTAL FACTORS AND PRINCIPLES RELEVANT TO THIS PROPOSAL

In August 2009, the Minister for the Environment provided the Proponent with the opportunity to:

(i) Establish the environmental significance of the vegetation on Armstrong Reserve and demonstrate whether the proposal can be managed in an environmentally acceptable manner to protect these flora values;
(ii) Determine the environmental significance of Armstrong Reserve as habitat for the Western Ringtail Possum and demonstrate whether the proposal could be managed in an environmentally acceptable manner to protect the local populations of this species;
(iii) Demonstrate that the proposal can be developed to be consistent with EPA policy, specifically Position Statement No. 2 *Environmental Protection of Native Vegetation in Western Australia*; and Position Statement No. 9 *Environmental Offsets*; and
(iv) Address the EPA's concern about the long-term viability of the remaining bushland on Armstrong Reserve.

A table of relevant environmental factors, their potential environmental impacts, proposed management measures and the predicted environmental outcome as applied to the proposed development are shown on **Table 19**. In addition, **Table 20** examines the principles of environmental protection as applied to the proposed development.

Level 2 fauna, flora and vegetation surveys undertaken on-site were conducted in accordance with key EPA guidance statements. Data obtained during the surveys have been used to establish the environmental significance of the site in terms of vegetation and habitat with a view to establishing appropriate mitigation measures to ensure long-term viability of the remaining bushland located outside of the proposed development footprint.

In order to mitigate residual impacts on key environmental assets (Western Ringtail Possum habitat and a nominated PEC) that are likely to result from the proposal to develop a 1.28 ha portion of the site containing 9020m^2 remnant vegetation, the Proponent is committed to providing appropriate offsets which aim to achieve a no net loss to Western Ringtail Possum habitat and that will increase the ecosystem health condition of the site enabling long-term environmental benefits to be afforded to the site.

The environmental offsets strategy proposed includes:

I. Rehabilitating 1.8 ha an off-site location (City of Busselton Reserve 31645 Caves Road Dunsborough).
J. Preparing and implementing a Revegetation and Rehabilitation Management Plan for the offset site.
K. Assessment of the immediate and long-term effects of development on the Western Ringtail Possum through implementation of a Western Ringtail Possum monitoring program on-site.
L. Preparing and implementing an Environmental (Vegetation and Fauna) Management Plan for the site.
M. Implementing a Fire Management Plan that has been prepared in consultation with and to the satisfaction of the City of Busselton, FESA and the DEC.

N. Preparing and implementing a Drainage Management Plan to the satisfaction of the City of Busselton that is designed to avoid any changes to the natural hydrology of the vegetation that is to be retained on-site.
O. Preparing and implementing a Dieback Management Plan to prevent further spread of *Phytophthora cinnamomi* within the site.
P. Preparing and implementing a Remediation and Validation Management Plan for the proposed development footprint.

With respect to the long-term management options available for the remaining 70% of the site located outside of the proposed development footprint, the City has advised that it would be willing to retain the vesting of the remainder of the site and manage it as Conservation POS (P. Malavisi pers. comm.). The planning process that will be entered into, should State and Commonwealth environmental approvals be granted, will involve the rezoning followed by subdivision/amalgamation of the affected lots. With respect to the area of Lot 257 that is located outside of the proposed development footprint, the City has advised that it will recommend to the Department of Lands that the legal use be changed from 'Recreation' to 'Landscape Protection' (P. Malavisi pers. comm.). Furthermore, the City has advised that it has no objection to the amalgamation of the lots south of Lot 258 and that this process will also be dealt with by the Department of Lands. The proposed development footprint will continue to be identified on the Scheme map as 'Recreation' until such time that the City has an omnibus amendment which will then likely change the identification in the Scheme to 'Special Purpose Zone – Aged Persons' (P. Malavisi, pers. comm.)

Based on the management measures and environmental offsets strategy that are proposed to be implemented by the Proponent, the City of Busselton's long-term management plan for the remainder of the site located outside of the proposed development footprint, it is concluded that the proposal to develop 1.28 ha of Armstrong Reserve can be managed in an environmentally acceptable manner to meet the EPA's and DSEWPaC's environmental objectives and guidelines for Flora and Vegetation, Specially Protected (Threatened) Fauna and Soil Quality.

TABLE 19
SUMMARY OF KEY POTENTIAL IMPACTS OF PROPOSAL, PROPOSED MANAGEMENT MEASURES AND PREDICTED ENVIRONMENTAL OUTCOMES

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
Flora and Vegetation	Site (~4.02 ha)	To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (Environmental Protection Authority, 2044).	Clearing 9020 m^2 of native vegetation and retention of 2.83 ha. The proposed retention represents 77% of the 3.67 ha of native vegetation that occurs on the site. The vegetation to be cleared includes 4352 m^2 of the nominated PEC. The area of nominated PEC to be cleared represents 13%of the total area of nominated PEC (approximately 3.21 ha) on the site which means that 87% of the PEC on the site will be retained. Clearing 9020 m^2 (0.01%) of the 3198 ha of the remaining Abba Vegetation Complex. Alter the hydrology of an existing drainage channel occurring in the dampland vegetation the area of vegetation to be retained, adversely impacting on the nominated PEC. Increase the number of weeds establishing in the retained native vegetation. The Conservation POS may be impacted by the 'edge effect' (e.g. invasion of natural vegetation by weeds due to disturbance and improving access to pest animals such as foxes and feral cats that tend to move and harbour along roads and tracks). Introduce dieback disease into the site.	An Environmental (Vegetation and Fauna) Management Plan (EMP) will be prepared in consultation with and to the satisfaction of the DEC, DSEWPaC and the City of Busselton. The Proponent will be responsible for the implementation of the approved EMP for a period of three (3) years following which the City of Busselton will assume responsibility for implementation. The principal objectives of the EMP will be to: • Protect the conservation values within the area to be set aside as Conservation POS. • Conserve and enhance the natural habitat of the Western Ringtail Possum wherever practicable outside of the building footprint associated with the development area. The EMP will include but not be limited to: • Identification and protection of Western Ringtail Possum habitat and significant trees that are identified following detailed engineering/architectural design phase can be retained within the proposed development footprint; • Identification and protection of Black Cockatoo and Western Ringtail Possum habitat and significant trees that are to be retained outside of the proposed development footprint; • Clearing protocols to protect Black Cockatoo and Western Ringtail Possums both prior to and during clearing and construction activities; • A Western Ringtail Possum monitoring program to assess: - Derive a quantitative estimate of the population size within the site; and - Assess the immediate and long-term effects from the proposed development on the population within the site • Weed eradication program; • Detailed planting/landscaping plan for the proposed development footprint; • Revegetating degraded areas within the site with appropriate indigenous flora; • Soil and plant source material hygiene; • Controlling pedestrian and vehicle access to the site;	Approximately 9020 m^2 of native vegetation will be cleared for the proposed development including 4352 m^2 of the nominated Priority 1 Ecological Community "*Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area". Approximately 87% of the nominated PEC will be retained on the site and will be managed for conservation by the City of Busselton in accordance with a comprehensive Environmental (Vegetation and Fauna) Management Plan. This is an improvement on the current unmanaged situation for the vegetation on the site. At the vegetation complex level the proposed clearing of 9020 m^2 represents a very small percentage (0.01%) reduction in the amount of Abba Vegetation Complex remaining but will slightly increase the amount of this vegetation complex in a reserve managed for its conservation values. The EPA's environmental objective for Flora and Vegetation will be achieved through restricting clearing to within the proposed footprint development and managing potentially adverse construction impacts through the implementation of a comprehensive EMP.

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
				• Water conservation principles; • Education program including signage, pamphlets and other means, to engage the residential community about the function of the Western Ringtail Possum and its habitat requirements; • Responsibilities for implementation; • Monitoring criteria to determine the success of the revegetation and weed eradication program; • Progress and compliance reporting; and • Timing and implementation schedule that specific management measures will occur on-site. A Fire Management Plan (FMP) has been prepared in consultation with and to the satisfaction of the Fire and Emergency Services Authority (FESA), City of Busselton and the DEC. The principal objectives of the FMP are to: • Manage the potential impacts of a bush fire on the proposed development. • To reduce the threat to residents in the event of a fire within or near the proposed development by providing a hazard separation zone between remnant bushland and the proposed development. The bushfire protection requirements, as per the *Planning for Bushfire Protection Guidelines* (Western Australian Planning Commission and the Fire and Emergency Services Authority, 2010) will be contained within the proposed development footprint and not encroach upon the proposed Conservation POS. The FMP incorporates fire management methods such as: • Strategic firebreak system • Dwelling construction and setbacks • Building protection zone • Hazard separation zone • Hazard reduction • Provision of adequate water for fire fighting purposes • Progress and compliance reporting • Timing and implementation schedule. A Drainage Management Plan will be prepared and implemented on-site to protect the area of vegetation to be retained from any adverse changes in hydrology. To prevent further spread of *Phytophthora cinnamomi* dieback in Armstrong Reserve, a Dieback Management Plan	

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
				will be prepared and implemented to the specifications of the DEC Guidelines (Department of Conservation and Land Management, 2004).	
Specially Protected (Threatened) Fauna	Site (~4.02 ha)	To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (Environmental Protection Authority, 2004).	Western Ringtail Possum and potential Black Cockatoo habitat loss and fragmentation through clearing of 9020 m^2 of native vegetation to create the proposed development footprint. Loss of canopy connectivity used by individual Western Ringtail Possum at the local level to access habitat patches, and loss of habitat corridors, which allow populations to remain connected to the landscape. Fragmentation of habitat linkages may cause Western Ringtail Possum individuals to descend to the ground more frequently thereby increasing their risk from ground predators. Physical injury or fatality to fauna may occur during the vegetation clearing process and construction activities.	An Environmental (Vegetation and Fauna) Management Plan (EMP) will be prepared in consultation with and to the satisfaction of the DEC, DSEWPaC and the City of Busselton. The Proponent will be responsible for the implementation of the approved EMP for a period of three (3) years following which the City of Busselton will assume responsibility for implementation. The principal objectives of the EMP will be to: • Protect the conservation values within the area to be set aside as Conservation POS. • Conserve and enhance the natural habitat of the Western Ringtail Possum wherever practicable outside of the building footprint associated with the proposed development area. The EMP will include but not be limited to: • Identification and protection of Western Ringtail Possum habitat and significant trees that are identified following detailed engineering/architectural design phase can be retained within the proposed development footprint; • Identification and protection of Black Cockatoo and Western Ringtail Possum habitat and significant trees that are to be retained outside of the proposed development footprint; • Clearing protocols to protect Black Cockatoo and Western Ringtail Possums both prior to and during clearing and construction activities; • A Western Ringtail Possum monitoring program to assess: - Derive a quantitative estimate of the population size within the site; and - Assess the immediate and long-term effects from the proposed development on the population within the site • Weed eradication program; • Detailed planting/landscaping plan for the proposed development footprint; • Revegetating degraded areas within the site with appropriate indigenous flora; • Soil and plant source material hygiene; • Controlling pedestrian and vehicle access to the site; • Water conservation principles;	Approximately 9020 m^2 of Western Ringtail Possum habitat will be cleared within the proposed development footprint. Conservation value habitat comprising approximately 2.83 ha located outside of the proposed development footprint will be retained, protected and enhanced in a reserve managed for its conservation values. No fauna species of conservation significance will cease to exist neither will their conservation status be adversely affected as a result of the implementation of the proposal. It is highly unlikely that the implementation of the proposal will have an adverse impact on fauna of conservation significance at a regional scale and those of a local scale are considered to be acceptable with rehabilitation of disturbed areas and the potential for environmental benefits from proposed offsets. At a local scale the availability of Western Ringtail Possum habitat over the short-term will decrease, however this will be compensated for by the potential for environmental benefits from proposed offsets including the rehabilitation of City of Busselton's Reserve 31645 with the planting of 1.8 ha of understorey vegetation and 700 native Peppermint trees. Reserve 31645 is a C class reserve zoned 'Recreation' located on Caves Road, Dunsborough and abuts the southern boundary of Peron Reserve a known Western Ringtail Possum habitat area. The rehabilitation of Reserve 31645 will result in infill of a fragmented habitat in this part of Dunsborough. No evidence of roosting, nesting or foraging by Black Cockatoos was observed within the proposed development footprint and it is anticipated therefore that there will be no significant impact upon either Black Cockatoo habitat or populations as a result of clearing the proposed development footprint.

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
				• Education program including signage, pamphlets and other means, to engage the residential community about the function of the Western Ringtail Possum and its habitat requirements; • Responsibilities for implementation; • Monitoring criteria to determine the success of the revegetation and weed eradication program; • Progress and compliance reporting; and • Timing and implementation schedule that specific management measures will occur on-site. A Revegetation and Rehabilitation Plan (RRP) will be developed in consultation with the City of Busselton and DSEWPaC for the offset site (Reserve 31645, Caves Road Dunsborough) proposed for revegetation and rehabilitation. The Proponent will be responsible for the implementation of the approved RRP for a period of three (3) years following which the City of Busselton will assume responsibility for implementation. The RRP will include but not be limited to: • Site details (including maps and coordinates); • Revegetation principles: - Methodology - Weed control - Soil preparation - Pest management - Planting schedule - Species Selection • Revegetation details; • Responsibilities for implementation; • Monitoring criteria to determine the success of the revegetation program; • Progress and compliance reporting; and • Timing and implementation schedule that specific management measures will occur at the offset site.	The EPA's environmental objective for Specially Protected (Threatened) Fauna will be achieved through restricting clearing to within the proposed footprint development and managing potentially adverse construction impacts through the implementation of a comprehensive EMP.
Soil Quality	Lots 111, 115, 116 and 117 Naturaliste Terrace, Dunsborough (~ 3984 m^2)	To ensure that rehabilitation achieves an acceptable standard compatible with the intended land use and consistent with appropriate criteria (Environmental Protection Authority, 2004).	Several areas of AEC have been identified that potentially could result in unacceptable health and environmental impacts. Predominant exposure pathways, through inhalation and ingestion, may impact on the health and well-being of residents.	A Detailed Site Investigation (DSI) will be conducted in accordance with the DEC's Contaminated Sites Management Series in order to assess the contamination status of the site, the associated environmental risks and any requirement for remedial action. The DSI will comprise the following: • Undertaking a Stage 2 DSI of the assessment area including: - EC1 (concrete ramp) – 2 soil bores > 1 mBGL (4	Based on the inferred extent and probably sources of contamination, and the remediation and validation that is proposed be implemented, it is considered that the proposed rehabilitation will achieve an acceptable standard compatible with the intended land use, and consistent with appropriate criteria. The EPA's environmental objective for Soil Quality will be achieved through managing potential contamination impacts through the

ENVIRONMENTAL FACTOR	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS	MANAGEMENT MEASURES	PREDICTED OUTCOME
				samples) - AEC2 (grey shed) – 5 soil bores > 1 mBGL (10 samples) - AEC3 (surface water) – surface and sediments samples (judgemental basis) (3 samples) • Analytical suite will be limited to a selection of common contaminants of concern: eight heavy metals (arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc), Total Petroleum Hydrocarbons (TPH) and organochlorine/ organophosphorous pesticides (OC/OP Pesticides). • Reporting of the results of the DSI. Should the DSI identify areas of contaminated soil in excess of EIL criteria, a Site Remediation and Validation Plan will be prepared in consultation with the DEC and a Contaminated Sites Auditor and implemented in accordance with relevant DEC Guidelines for the remediation of contaminated soils. The site has been identified by the Western Australian Planning Commission (2009) as having a 'Moderate to Low Risk of acid sulfate soils (ASS) occurring within 3m of natural soil surface or deeper'. All assessment and management of ASS will be conducted in accordance with the Acid Sulphate Soil Guideline Series Identification and Investigation of Acid Sulfate Soils (DoE, 2004). If required, an Acid Sulfate Soils Investigation and Management Plan will be prepared and implemented in consultation with the DEC.	implementation of a detailed site investigation and associated remediation and validation management plan should this be required.

TABLE 20
PRINCIPLES OF ENVIRONMENTAL PROTECTION AS APPLIED TO THE PROPOSAL

PRINCIPLE	RELEVANT YES/NO	IF YES, CONSIDERATION
1. The precautionary principle Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decisions should be guided by: (a) Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and (b) An assessment of the risk-weighted consequences of various options.	**YES**	Sufficient knowledge exists to address potential environmental impacts. Specialist studies (e.g. flora, fauna and soil quality) have been undertaken to assess the environment and potential impacts.
2. The principle of intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.	**YES**	The Proponent has incorporated the principles of sustainability into the redesign of the amended development footprint to ensure that approximately 45% of the site is to be retained in perpetuity as a Conservation POS area that is to be managed in the long-term by the City of Busselton.
3. The principle of conservation of biological diversity and ecological integrity Conservation of biological diversity and ecological integrity should be a fundamental consideration.	**YES**	Investigations undertaken for flora (remnant vegetation, TF and TEC) and fauna (priority and scheduled species) have been undertaken in accordance with the EPA's relevant Guidance Statements. The findings will form the basis of an Environmental (Vegetation and Fauna) Management Plan to be prepared for the site as part of the development approvals process. The proposed development footprint comprises 1.28 ha (of which 4332m^2 has been historically cleared) and focuses on utilising Lots 111, 115-117 that contain the Shire Depot, FESA and CWA buildings and a 9994m^2 portion of Lot 257. The remaining 70% of the site will remain vested in the City of Busselton and managed as Conservation POS.
4. Principles relating to improved valuation, pricing and incentive mechanisms • Environmental factors should be included in the valuation of assets and services. • The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement. • The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and ultimate disposal of any waste. • Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems.	**YES**	The initial Concept Plan for the proposed development submitted to both the EPA and the DSEWPaC which showed the proposed development covering 100% of the site has been discarded by the Proponent and subsequent environmental planning has focused on reducing the size of the development footprint in order to preserve as much of the remnant vegetation contained within the site as is practicable and in keeping with sustainability principles.
5. The principle of waste minimisation All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	**YES**	In the event that environmental approval is granted, a number of management plans will be prepared for the proposed development to guide any remediation and validation activities required to be implemented due to the previous use of the site by the City of Busselton as a Shire Depot. This work will be undertaken in accordance with the *Contaminated Sites Act 2003*, EPA Guidance and DEC Guidelines. The preferred management options that are to be implemented during the construction and operation of the proposed development are to avoid, reduce, reuse, recycle and recover waste wherever practicable.

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FIGURES

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FIRE MANAGEMENT PLAN

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APPENDIX 9
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