



1. Application details

1.1. Permit application details

Permit application No.: 2117/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Water Corporation

1.3. Property details

Property: LOT 50 ON DIAGRAM 67996 (House No. 46 GREENLEES CARABOODA 6033)
LOT 5425 ON PLAN 206216 (House No. 99 KILN CARABOODA 6033)
LOT 8038 ON PLAN 206216 (House No. 115 KILN CARABOODA 6033)
LOT 5426 ON PLAN 206216 (House No. 60 KILN NOWERGUP 6032)
LOT 5466 ON PLAN 206216 (House No. 116 KILN NOWERGUP 6032)
LOT 106 ON PLAN 14371 (House No. 149 MCLENNAN NOWERGUP 6032)
LOT 106 ON PLAN 14371 (House No. 149 MCLENNAN NOWERGUP 6032)
LOT 106 ON PLAN 14371 (House No. 149 MCLENNAN NOWERGUP 6032)
LOT 106 ON PLAN 14371 (House No. 149 MCLENNAN NOWERGUP 6032)
ROAD RESERVE (NOWERGUP 6032)
LOT 107 ON PLAN 14371 (House No. 59 GODEL NOWERGUP 6032)
LOT 10 ON DIAGRAM 65558 (House No. 465 GIBBS NOWERGUP 6032)
LOT 10 ON DIAGRAM 65558 (House No. 465 GIBBS NOWERGUP 6032)
LOT 181 ON PLAN 27522 (House No. 38 KAROBORUP NOWERGUP 6032)
LOT 181 ON PLAN 27522 (House No. 38 KAROBORUP NOWERGUP 6032)
LOT 6278 ON PLAN 207588 (House No. 2632 WANNEROO NOWERGUP 6032)
LOT 6278 ON PLAN 207588 (House No. 2632 WANNEROO NOWERGUP 6032)
ROAD RESERVE (CARABOODA 6033)
ROAD RESERVE (CARABOODA 6033)
ROAD RESERVE (CARABOODA 6033)
ROAD RESERVE (CARABOODA 6033)
LOT 102 ON PLAN 15760 (House No. 80 ROMEO ALKIMOS 6038)
LOT 3 ON PLAN 9383 (House No. 77 ROMEO ALKIMOS 6038)
City Of Wanneroo

Local Government Area:
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
9.4		Mechanical Removal	Building or Structure

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Beard Vegetation Associations:</p> <ul style="list-style-type: none"> - 949: Low woodland; banksia. - 998: Medium woodland; tuart. <p>(Shepherd 2006).</p> <p>Heddl Vegetation Complexes:</p> <ul style="list-style-type: none"> - Cottesloe Central and South: Mosaic of woodland of E.gomphocephala and open forest of 	<p>The proposal is to clear a maximum of 9.4ha of native vegetation within a linear area approximately 5km long and 25 metres wide (total area 12.8ha), for the purpose of constructing an underground inlet/outlet pipeline from the proposed Carabooda storage/reservoir tank, to service the developing north-west corridor of the Perth Metropolitan Region (GHD, 2007). The applied area is required for Stage 1</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994)</p>	<p>The vegetation description was determined by information provided in the Clearing Application and Landscape Plan (GHD 2007) and from aerial imagery.</p> <p>An overall rating of 'Good' has been applied as the vegetation ranges in condition from Completely degraded to Pristine or nearly so (GHD 2007).</p>

E.gomphocephala -
E.marginata - *C.calophylla*;
closed heath on limestone
outcrops.

- Herdsman Complex:
Sedgelands and fringing
woodland of *E.rudis*-
Melaleuca species
(Heddle et al. 1980).

of the project, with Stage 2
proposed in 2012/13 (GHD
2007).

Eight vegetation
communities have been
identified across the project
area. These vegetation
communities are described
below (from the western
extent of the applied area
to the eastern extent).
Inferred Floristic
Community Types are
included with the
vegetation community
name.

- Tuart open woodland to
woodland (FCT 28):
Recorded adjacent to the
Butler subdivision area and
in good condition with
evidence of weed invasion.
This vegetation community
covers an area of ~0.1ha
within the applied area;

- Banksia low woodland
(FCT 24 and 28): Recorded
within remnant vegetation
within and adjacent to
Neerabup National Park,
and in very good to
excellent condition. This
vegetation community
covers an area of ~6.3ha
within the applied area;

- Road
verge/Rehabilitated/Planted
(FCT not determined):
Recorded along Romeo
and McLennon Roads, and
in a completely degraded
condition. This vegetation
community covers an area
of ~4.5ha within the applied
area;

- Jarrah woodland (FCT
28): Recorded within
private property and
proposed road reserve, and
in good condition. This
vegetation community
covers an area of ~6.2ha
within the applied area;

- Dryandra heath (FCT 30c
and 26b): One isolated
record within private
property, and in very good
condition. This vegetation
community covers an area
of ~0.2ha within the applied
area;

- Mixed limestone mallees
and shrubs (FCT 26b):
Recorded within private
property and on the
reservoir site, and in an
excellent condition. This
vegetation community
covers an area of ~0.8ha
within the applied area;

- *Melaleuca huegelii* and
Melaleuca systema
shrubland (FCT 26a):
Recorded in two isolated
locations on limestone
peaks at the reservoir site,
and in Pristine or nearly so
condition. This vegetation

community does not occur within the applied area; and

- Cleared/weed dominated (FCT not determined): Recorded within the reservoir site and adjacent private property, and in a completely degraded condition. This vegetation community covers an area of ~0.9ha within the applied area (GHD 2007).

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is at variance to this Principle

The area of vegetation under application comprises eight vegetation communities ranging in condition from completely degraded to excellent (GHD 2007).

A flora and vegetation survey of the proposed pipeline route identified *Jacksonia sericea* (Priority 4) as a common component of the understorey within low *Banksia* woodland, Tuart open woodland, Jarrah open forest and mixed limestone mallees and shrublands vegetation communities (GHD 2007). Whilst common within the application area, this species has a limited distribution in the Swan Coastal Plain. The flora survey also identified specimens of *Stylidium juncea* within the survey area. These specimens are located within the poorly known northern extremity of the species' range. In addition, the area under application is within close proximity (~20m) to the inferred boundary of an inferred Threatened Ecological Community (TEC) and may comprise an integration of species from this community and the mapped Mixed limestone mallees and shrubs vegetation community.

Overall the flora and vegetation survey of the Stage 1 study area recorded a total of 280 taxa from 66 families, and was determined to comprise high floral species diversity (GHD 2007).

The presence of a high floral diversity and range of vegetation communities and conditions is considered likely to result in a variety of habitats suitable for supporting local indigenous fauna, including amphibians in the low lying wetland areas, reptiles within the limestone outcrops and more open vegetation, and birds and mammals within the areas of dense overstorey and understorey (GHD 2007).

Given the high floral diversity, diversity of vegetation communities within the applied area and likely high diversity of fauna species due to the variety of habitats available, the area of vegetation under application is considered to comprise a high level of biological diversity.

An offset condition on a permit is considered to mitigate the proposal's impact on biodiversity.

Methodology

References:

- GHD (2007)
- GHD (2007a)

GIS Databases:

- Geomorphic Wetlands (Mgt Categories), Swan Coastal Plain
- Hydrography, linear
- Swan Coastal Plain North 20cm Orthomosaic - DLI06

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal may be at variance to this Principle

The area of vegetation under application comprises eight vegetation communities ranging in condition from completely degraded to excellent (GHD 2007).

Four fauna species of conservation significance have been recorded within the local area (5km radius):

- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Endangered),
- Carpet Python (*Morelia spilota imbricata*) (Schedule 4),
- Western Brush Wallaby (*Macropus irma*) (Priority 4); and
- Quenda (*Isodon obesulus fusciventer*) (Priority 5).

Opportunistic field fauna surveys within the survey area recorded a total of 31 birds, 4 mammals and 3 reptile species (GHD 2007a). Whilst this is considered to be a poor return for the amount of time spent in the field (240 hours) and area covered, the survey did not include any trapping and only recorded species from visual and aural observations (GHD 2007a), and is therefore not considered to be representative of the fauna diversity present within the application area.

The vegetation under application comprises a diverse range of habitats suitable for a suite of fauna species from amphibians to reptiles, to bird and mammals. In particular, the field fauna survey identified rich avian fauna diversity, with eight bird species considered to be regionally significant due to reductions in distribution of population size on the Swan Coastal Plain, within the survey area (GHD 2007a).

The vegetation under application is considered to provide feeding habitat for conservation significant fauna, including the Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) and Quenda (*Isodon obesulus fusciventer*). Carnaby's Cockatoos are known to feed on *Corymbia calophylla*, *Eucalyptus marginata* and *Eucalyptus gomphocephala* (Birds Australia WA 2006), with the Northern Region of the Swan Coastal Plain considered to be an important area throughout the season for this species (Shah 2006). Quenda are also under threat from urban development and are known to inhabit areas of dense vegetation cover, particularly around watercourses and wetlands (GHD 2007). Given the presence of suitable habitat and proximity of the area to wetlands and watercourses it is likely that Quenda utilise and inhabit parts of the vegetation under application.

In addition, the vegetation under application is located within part of a contiguous vegetation corridor which links the Neerabup Nature Reserve and National Park to the Gnangara-Moore River State Forest (Department of Environment 2004, CALM 2004), and the clearing of vegetation to a width of 25m across a 5km length is considered likely to increase habitat fragmentation within the local area. Therefore the vegetation under application is considered to comprise vegetation located within a locally significant ecological linkage and to provide connectivity to facilitate the movement of fauna between nearby wetlands and conservation areas.

Given the diversity of habitats present within the area under application, relatively large area proposed to be cleared (9.4ha) within a locally significant ecological linkage between conservation areas, likely impacts of habitat fragmentation and potential utilisation of the area under application for foraging and habitat by Carnaby's Black Cockatoo and Quenda, the vegetation under application may comprise the whole or part of significant habitat for local indigenous fauna.

A fauna management condition will be imposed for habitat trees.

- Methodology** **References:**
- Birds Australia WA (2006)
 - CALM (2004)
 - Department of Environment (2004)
 - GHD (2007)
 - GHD (2007a)
 - Shah (2006)
- GIS Databases:**
- SAC Bio Dataset 23/01/2008
 - Geomorphic Wetlands (Mgt Categories), Swan Coastal Plain
 - Hydrography, linear
 - Swan Coastal Plain North 20cm Orthomosaic - DLI06

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

- Comments** **Proposal is not likely to be at variance to this Principle**
- There is one Declared Rare Flora (DRF) species known to occur within a 5km radius of the vegetation under vegetation, being *Eucalyptus argutifolia*. The closest known population of this species is located 2.3km from the area under application.

No DRF were identified during a flora and vegetation survey undertaken in 2005 (GHD 2007a). Therefore the proposed clearing is not considered likely to be at variance to this Principle.

- Methodology** **Reference:**
- GHD (2007a)
- GIS Database:**
- SAC Bio Datasets 11/04/2008

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

- Comments** **Proposal may be at variance to this Principle**
- There are several known occurrences of Threatened Ecological Communities (TEC) within the local area (5km radius), including twenty recorded occurrences of the Endangered Floristic Community Type (FCT) 26a, known as 'Melaleuca huegelii-Melaleuca systema shrublands of limestone ridges' (Gibson et al, 1994), and one mapped occurrence of the Critically Endangered 'Aquatic Root Mat Community of Caves of the Swan Coastal Plain'. The closest recorded occurrence of a TEC is FCT 26a, located ~1.6km from the area under application, with the recorded occurrence of the Root Mat Community being ~ 5.1kms from the area under application.

Flora and vegetation surveys undertaken in 2005 and 2006 within the Stage 1 proposal survey area identified eight vegetation communities within the area of vegetation under application (GHD 2007a). Subsequent comparisons of these vegetation communities with Gibson et al. (1994) Floristic Community Types (FCT) identified one vegetation community as closely resembling the Threatened Ecological Community, FCT 26a.

The Clearing Application and Landscape Plan (GHD 2007) states that the inferred FCT 26a located within the project survey area will not be impacted by the reservoir or pipeline. However, the proposal is located within the 50m buffer to this inferred TEC. Given the close proximity to the proposed works (approximately 20m), the proposed clearing may impact on the inferred TEC due to the removal of buffering vegetation and increased disturbance to the surrounding area.

Therefore, whilst the vegetation community has only been inferred as FCT 26a at this stage and is yet to be confirmed as a TEC, the vegetation adjacent to this community may be considered necessary for the maintenance of a threatened ecological community.

- Methodology** **References:**
- GHD (2007)
 - GHD (2007a)
 - Gibson et al. (1994)
- GIS Databases:**
- SAC Bio Datasets 23/01/2008
 - Swan Coastal Plain North 20cm Orthomosaic - DLI06

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is not likely to be at variance to this Principle

The vegetation under application is associated with Beard Vegetation Associations 949 (~7.5ha) and 998 (~16ha) which have approximately 57.0% and 41.5% pre-European vegetation extent remaining respectively (Shepherd 2006). The vegetation under application is also associated with Heddle Vegetation Complex Cottesloe Central and South (~14.9ha) and Herdsman Complex (~4.1ha) which have 41.4% and 34.6% pre-European vegetation extent remaining respectively (EPA 2006).

The State Government is committed to the National Objectives and Targets for Biodiversity Conservation which includes a target that prevents a clearance of ecological communities with an extent below 30% of that present pre-European settlement (Commonwealth of Australia 2001). Of the mapped complexes associated within the area under application, none are below the State Government's biodiversity conservation target of 30%. In addition, the EPA (2006) recognises the Perth Metropolitan Region as a 'constrained area', providing for the reduction of vegetation complexes to a minimum of 10% of the Pre-European extent.

Whilst the area of vegetation under application is relatively large (9.4ha) and located within a region subject to growing clearing pressures as a result of urban expansion and semi-rural development, given that the vegetation communities are above both the State Government's 30% biodiversity target and the 10% minimum level recommended by the EPA (2006), the proposed clearing is considered not likely to be at variance to this Principle.

	Pre-European (ha)	Current extent (ha)	Remaining (%)	In secure tenure (%)
IBRA Bioregions				
Swan Coastal Plain**	1,501,456	571,758	38.1	
City of Wanneroo*	68,070	34,057	50.0	
Beard Vegetation Associations**				
- 949	218,204	124,461	57.0	49.3
- 998	51,017	21,178	41.5	35.2
Heddle Vegetation Complexes***				
- Cottesloe Central & South	44,995	18,474	41.4	8.8
- Herdsman Complex	8,309	2,875	34.6	11.5

* (Del Marco et al. 2004)

** (Shepherd 2006)

*** (EPA 2006)

- Methodology** **References:**
- Commonwealth of Australia (2001)
 - Del Marco et al. (2004)
 - EPA (2006)
 - GHD (2007)

- GHD (2007a)
- Shepherd et al. (2001)
- Shepherd (2006)
- GIS Databases:
 - Heddl Vegetation Complexes
 - Interim Biogeographic Regionalisation of Australia
 - Local Government Authorities
 - Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal may be at variance to this Principle

A mapped Resource Enhancement Wetland (REW)(UFI 8020), is located within the area under application. In addition, Carabooda Lake (REW) and Nowergup Lake (Conservation Category Wetland-CCW) are located within close proximity to the application area, being 120m north and 405m south of the applied area respectively. Both of these wetlands are protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy Approval Order 1992 (Government of Western Australia, 1992).

A minimum wetland buffer of 50m is recommended to all proposed developments or activities to protect wetland values and functions (Water and Rivers Commission, 2001). Given the distance to Carabooda Lake (120m) and Nowergup Lake (405m) the vegetation under application is not considered to be growing in association with this wetland, or be located within the recommended buffer area.

The area under application comprises a mapped Resource Enhancement Wetland. The vegetation community mapped within the REW area is considered to be in a completely degraded condition and has been described as 'Road verge/Rehabilitated/Planted' (GHD 2007a). However, native species have been recorded within this area, with aerial imaging showing a sparse overstorey.

Whilst there is a mapped REW within the application area, given the minimal vegetation present, the vegetation under application may be considered to be growing in, or in association with, an environment associated with a wetland.

Methodology

References:

- GHD (2007a)
- Government of Western Australia (1992)
- Water and River Commission (2001)
- GIS Databases:
 - EPP, Lakes
 - Geomorphic Wetlands (Mgt Categories), Swan Coastal Plain
 - Hydrography, linear
 - Swan Coastal Plain North 20cm Orthomosaic - DLI06
 - Topographic Contours, Metropolitan Area

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal may be at variance to this Principle

The area of vegetation under application is located within the Quindalup and Spearwood Dune Systems (GHD 2007). Soils within these dune systems are characterised by white to pale yellow sands derived from Tamala limestone and light grey quartz Bassendean sands respectively (Government of Western Australia 2000). These soils are known to have a high risk of wind erosion, high permeability and low nutrient retention capacity (Phosphorus Retention Index).

Notwithstanding, the proposal is to clear 9.4ha of native vegetation over a linear area ~5km long and 25m wide. Therefore whilst the geology of the site increases the risk of land degradation occurring post clearing, given the linear nature of the vegetation under application the proposed clearing is not considered likely to lead to appreciable land degradation.

Small, localised areas of water and wind erosion may result from the proposed clearing. However if managed, are considered unlikely to result in appreciable land degradation.

Methodology

References:

- GHD (2007)
- Government of Western Australia (2000)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is at variance to this Principle

There are several conservation areas within the local area, with the area under application comprising a portion of Bush Forever Site 383 (known as Neerabup National Park, Lake Nowergup Nature Reserve and Adjacent Bushland, Neerabup) (Government of Western Australia 2000), and the Neerabup National Park abutting the area under application within the western extent. These areas are listed on the Register of National Estate for their natural values.

Bush Forever (Government of Western Australia 2000) identified these natural areas as providing a contiguous or largely contiguous corridor of bushland to wetland areas, with the vegetation under application located within an important local ecological linkage between the Neerabup Nature Reserve and National Park to the Gngangara-Moore River State Forest (Department of Environment 2004, CALM 2004). Furthermore, 'the linkage between Neerabup National Park and Nature Reserve and the Gngangara-Moore River State Forest is currently at the minimum possible width to maintain its functionality' (Department of Environment 2004).

Given the location of the proposal within a local ecological linkage and the proposed clearing of 25m of vegetation over a length of 5km, it is considered that the removal of the vegetation is likely to have a significant detrimental impact on the values of the Bush Forever areas. In particular, fragmentation of remnant vegetation within the eastern portion of the vegetation under application is also considered likely to impact on the linkage values within these remnant areas, as well as the larger linkage between the Neerabup Nature Reserve and National Park to the Gngangara-Moore River State Forest.

Extensive clearing and proposed residential and rural developments within the local area has had a significant impact on remnant vegetation within the local area, and any further clearing in the local area will increase fragmentation of vegetation and may contribute to the isolation of Bush Forever sites, affecting their long term viability (CALM 2004). Given this and the direct loss and fragmentation of vegetation within the Neerabup National Park and Bush Forever Site 383 resulting from the proposed clearing, the proposal is considered to be at variance to this Principle.

An offset condition on a permit is considered likely to mitigate the proposal's impact on local conservation areas.

Methodology References:
- CALM (2004)
- Department of Environment (2004)
- Government of Western Australia (2000)
GIS Databases:
- Bushforever
- CALM Managed Lands and Waters
- Register of National Estate
- Swan Coastal Plain North 20cm Orthomosaic - DLI06

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal may be at variance to this Principle

A Resource Enhancement Wetland (REW) is mapped within the applied area. Carabooda Lake (REW) and the Conservation Category Wetland (CCW), Nowergup Lake, are also located within close proximity to the application area, being 120m north and 405m south of the applied area respectively. Both of these wetlands are protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy Approval Order 1992 (Government of Western Australia 1992).

The area under application is not located within a Priority Drinking Water Source Area (PDWSA) and there is a low to high salinity risk.

The vegetation under application is located within the Quindalup and Spearwood Dune Systems (GHD 2007). Soils within these dune systems are characterised by white to pale yellow sands derived from Tamala limestone and light grey quartz Bassendean sands respectively (Government of Western Australia 2000). These soils are known to have a high permeability and low nutrient holding capacity (Phosphorus Retention Index).

Whilst it is recognised that the area of vegetation under application within the mapped Resource Enhancement wetland is sparsely vegetated, the proposed clearing is considered likely to cause the deterioration in surface water quality of this mapped wetland. In addition, runoff comprising mobilised nutrients following the clearing may impact on the nearby Carabooda and Nowergup Lakes given the topography of the landscape and likely surface and underground water flow in these directions. Therefore, the proposed clearing may be at variance to this Principle.

Methodology References:

- GHD (2007)
- GHD (2007a)
- Government of Western Australia (1992)
- Government of Western Australia (2000)
- GIS Databases:
 - EPP, Areas
 - EPP, Lakes
 - Geomorphic Wetlands (Mgt Categories), Swan Coastal Plain
 - Groundwater Contours, Minimum
 - Public Drinking Water Source Areas (PDWSAs)
 - Swan Coastal Plain North 20cm Orthomosaic - DLI06
 - Topographic Contours, Metropolitan Area

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The vegetation under application is located within the Quindalup and Spearwood Dune Systems (GHD 2007). Soils within these dune systems are characterised by white to pale yellow sands derived from Tamala limestone and light grey quartz Bassendean sands respectively (Government of Western Australia 2000). These soils are known to have a high permeability due to the porous nature of the sands.

The proposal is to clear 9.4ha over a linear area of ~ 5km long and 25m wide. Given the highly porous nature of the sands the proposed clearing is not considered likely to cause, or exacerbate, the incidence or intensity of flooding.

- Methodology References:**
- GHD (2007)
 - Government of Western Australia (2000)

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

A portion of the vegetation under application is located within Bush Forever Site 383. Bush Forever Site 383 is listed on the Register of National Estate and is therefore subject to protection under the Commonwealth Environment Protection Biodiversity Conservation Act 1999. Under the EPBC Act 1999, 'a person must not take an action that has, will have or is likely to have a significant impact on any of the matters of national significance without approval from the Australian Government Environment Minister' (Department of the Environment and Water Resources 2007).

A submission from the Bush Forever office (2008) advises that the Bush Forever site that will be impacted by the proposed clearing is part of an area listed for Government Lands and Public Infrastructure, and as such essential public infrastructure is supported with a mitigation package for any clearing works. The Bush Forever office recommends an offset package of 2:1 in accordance with EPA Position Statement No. 9, where 'like for like or better' is recommended, and that all construction is done in an environmentally sensitive manner with minimum disturbance to the natural vegetation and temporary fencing for the duration of the works.

The Water Corporation is currently undertaking compulsory acquisition of private properties within the project area. Whilst this process has not been finalised, the Water Corporation has legal access to these properties under the Water Corporation Act 1995.

There are no Aboriginal Sites of Significance mapped within the area of vegetation under application.

- Methodology There is no RIWI Act Licence, EP Act Licence or Works Approval required for this development.**
- References:**
- Bush Forever (2008)
 - Department of the Environment and Water Resources (2007)
- GIS Databases:**
- Aboriginal Sites of Significance
 - Bushforever

4. Assessor's comments

Comment

The assessable criteria have been addressed and the clearing as proposed is at variance to Principles (a) and (h), and may be at variance to Principles (b), (d), (f), (g) and (i).

5. References

- Birds Australia WA (2006). Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia. Carnaby's Black-Cockatoo Recovery Project (<http://www.hotgecko.com/carnabys/Carnabys.htm>). Accessed on Friday, 13 July 2007.
- Bush Forever (2008) Direct Interest submission in relation to clearing permit application CPS 2117/1 (TRIM Ref. DOC46823).
- CALM (2004) Land clearing proposal advice to the Commissioner of Soil and Land Conservation in relation to Lot 5426 Kiln Rd, Nowergup. Prepared by the Inter Departmental Committee. Department of Conservation and Land Management (CALM), Western Australia (TRIM Ref. DOC43665).
- Commonwealth of Australia (2001) National Targets and Objectives for Biodiversity Conservation 2001-2005, AGPS, Canberra.
- Del Marco, A., Miles, C., Taylor, R., Clarke, K. and Savage, K. (2004) Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region - Edition 1. Western Australian Local Government Association, West Perth.
- Department of Environment (2004) Land clearing proposal advice to the Commissioner of Soil and Land Conservation in relation to Lot 5426 Kiln Rd, Nowergup. Prepared by the Inter Departmental Committee. Department of Environment, Western Australia (TRIM Ref. DOC43665).
- Department of the Environment and Water Resources (2007) Environment Protection and Biodiversity Conservation Act 1999: A Guide to the EPBC Act. October 2007. Department of the Environment and Water Resources, Canberra.
- EPA (2006) Guidance for the Assessment of Environmental Factors -level of assessment of proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of the System 1 Region. Report by the EPA under the Environmental Protection Act 1986. No 10 WA.
- GHD (2007) Water Corporation Carabooda 60ML Tank and DN 1200 Inlet/Outlet Main, Clearing Application and Landscaping Plan. August 2007. GHD, Western Australia.
- GHD (2007a) Water Corporation Carabooda Reservoir and Stage 1 Outlet Flora and Fauna Assessment, March 2006. GHD, Western Australia.
- Gibson N., Keighery B., Keighery G., Burbidge A. and Lyons M. (1994). A Floristic Survey of the Southern Swan Coastal Plain. Western Australian Department of Conservation and Land Management and the Western Australian Conservation Council.
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- Government of Western Australia (2000) Bush Forever Volumes 1 and 2. Western Australian Planning Commission, Perth WA.
- Heddl, E. M., Loneragan, O. W., and Havel, J. J. (1980) Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
- Hopkins, A.J.M., Beeston, G.R. and Harvey J.M. (2001) A database on the vegetation of Western Australia. Stage 1. CALMScience after J. S. Beard, late 1960's to early 1980's Vegetation Survey of Western Australia, UWA Press.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
- Shah, B. (2006) Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.
- Shepherd, D.P. (2006). Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Water and Rivers Commission (2001). Position Statement: Wetlands, Water and Rivers Commission, Perth.

6. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DEC)

