**Title of Proposal** - Oakford Village, Shire of Serpentine-Jarrahdale WA

# Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

### 1.1 Project Industry Type

Residential Development

### 1.2 Provide a detailed description of the proposed action, including all proposed activities.

Humich Nominees Pty Ltd (Humich Nominees) is proposing to redevelop Lots 196, 197, 212, and 698 Nicholson Road, Oakford (183 ha) (proposed action area) as an urban village (Figure 1).

The proposed action area is currently zoned Rural both under the MRS and the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2 (TPS) and is located within the Jandakot District Structure Plan and Oakford Rural Economic Living Area Planning Framework. The proposed action area is located within the Peel Harvey Catchment.

The proposed action area is currently utilised for cattle grazing and is predominantly cleared. The environmental values of the proposed action area are considered to be very limited due to the degraded condition of vegetation and wetlands present. Previous environmental investigations have indicated that there are environmental aspects within the proposed action area which may require further management including, groundwater, surface water and wetlands.

The change in land use from Rural to Urban provides a stimulus for implementing measures to reduce nutrient inputs from the proposed action area into the Peel Harvey catchment. The implementation of a range of management measures for nutrients, groundwater and urban water will ensure that the change in land use from Rural to Urban will not have a significant impact on the environment and will lead to a reduction in nutrient export within the Peel Harvey catchment with correct implementation.

To facilitate urban development within the proposed action area, the following activities will be required:
* bulk earthworks- fill to achieve required separation to maximum groundwater levels
* treatment of stormwater through Sensitive Urban Water Design principles
* civil and infrastructure - lot and Public Open Space construction and installation of services (gas, water, sewerage)
* removal of no more than 52 black cockatoo habitat trees and up to 0.6 ha of very poor quality foraging habitat (over the total 183 ha area).

**1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.**

| Area | Point | Latitude | Longitude |
|---|---|---|---|
| Oakford Village | 1 | -32.210679081262 | 115.91517604491 |
| Oakford Village | 2 | -32.210697236187 | 115.91517604491 |
| Oakford Village | 3 | -32.208990631339 | 115.91663516661 |
| Oakford Village | 4 | -32.207610799752 | 115.91775096556 |
| Oakford Village | 5 | -32.207138747298 | 115.91826594969 |
| Oakford Village | 6 | -32.206521444239 | 115.91912425658 |
| Oakford Village | 7 | -32.206013073868 | 115.92028297087 |
| Oakford Village | 8 | -32.204996324603 | 115.92260039946 |
| Oakford Village | 9 | -32.204415319921 | 115.92453158995 |
| Oakford Village | 10 | -32.204415319921 | 115.92599071165 |
| Oakford Village | 11 | -32.20543207568 | 115.93521751067 |
| Oakford Village | 12 | -32.206013073868 | 115.93500293395 |
| Oakford Village | 13 | -32.206630380377 | 115.93491710326 |
| Oakford Village | 14 | -32.206920876108 | 115.9349600186 |
| Oakford Village | 15 | -32.207501864787 | 115.9349600186 |
| Oakford Village | 16 | -32.207864980827 | 115.93478835722 |
| Oakford Village | 17 | -32.208409652169 | 115.93453086516 |
| Oakford Village | 18 | -32.208663831012 | 115.93414462706 |
| Oakford Village | 19 | -32.209262964324 | 115.93367255827 |
| Oakford Village | 20 | -32.211732076998 | 115.93375838896 |
| Oakford Village | 21 | -32.211913626755 | 115.93362964293 |
| Oakford Village | 22 | -32.211949936663 | 115.93320048949 |
| Oakford Village | 23 | -32.211768386979 | 115.93298591277 |
| Oakford Village | 24 | -32.211695767004 | 115.93277133604 |
| Oakford Village | 25 | -32.211768386979 | 115.93238509795 |
| Oakford Village | 26 | -32.211877316833 | 115.9319559445 |
| Oakford Village | 27 | -32.211949936663 | 115.93152679106 |
| Oakford Village | 28 | -32.211913626755 | 115.931269299 |
| Oakford Village | 29 | -32.211732076998 | 115.93075431487 |
| Oakford Village | 30 | -32.211768386979 | 115.93023933073 |
| Oakford Village | 31 | -32.212167795806 | 115.92963851592 |
| Oakford Village | 32 | -32.212930298696 | 115.92955268523 |
| Oakford Village | 33 | -32.21372910439 | 115.92920936247 |
| Oakford Village | 34 | -32.214346358529 | 115.92878020903 |
| Oakford Village | 35 | -32.215435620319 | 115.92753566405 |
| Oakford Village | 36 | -32.215435620319 | 115.9241882672 |
| Oakford Village | 37 | -32.216198095808 | 115.9241882672 |
| Oakford Village | 38 | -32.216198095808 | 115.92148460051 |
| Oakford Village | 39 | -32.217868257871 | 115.92152751585 |
| Oakford Village | 40 | -32.217214719848 | 115.91929591795 |
| Oakford Village | 41 | -32.214455285295 | 115.91504729887 |

| Area | Point | Latitude | Longitude |
|---|---|---|---|
| Oakford Village | 42 | -32.210679081262 | 115.91517604491 |

**1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).**

The proposed action area is located within the Shire of Serpentine-Jarrahdale, approximately 30 km south of the Perth CBD. The proposed action area is bound by Thomas Road to the north and Abernethy Road to the south, with the Birrega Main Drain to the east and rural land to the West. Nicholson Road traverses the site from the north to south (Figure 1).

Regionally the proposed action area is located near the following:

* Bush forever Sites No. 347 and 348

* Jandakot Regional Park

* Birrega Main Drain which discharges to the Serpentine Main Drain (Figure 2).

**1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?**

The proposed action area comprises an area of approximately 183 ha.

**1.7 Is the proposed action a street address or lot?**

Lot

**1.7.2 Describe the lot number and title.**Lot 196 & 698 Thomas Rd, Oakford; Lot 197 & 213 Nicholson Rd, Oakford

**1.8 Primary Jurisdiction.**

Western Australia

**1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?**

No

**1.10 Is the proposed action subject to local government planning approval?**

Yes

**1.10.1 Is there a local government area and council contact for the proposal?**

No

**1.11 Provide an estimated start and estimated end date for the proposed action.**

Start date 12/2018

End date 12/2024

**1.12 Provide details of the context, planning framework and State and/or Local government requirements.**

The proposed action area is currently zoned Rural under both the Metropolitan Regional Scheme (MRS) and the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2 (TPS). The following provides an overview of the planning history relevant to the proposed action area:

* initially identified as an option for the development of the Oakford Rural Village in the Shire of Serpentine-Jarrahdale Rural Strategy (1994)

* WAPC's draft Jandakot Structure Plan (2001) identified the area at the intersection of Thomas Road and Nicholson Road as a 'rural village', the proposed action area was identified as being subject to 'severe servicing constraints and potential environmental impacts'

* a wider area, including the Oakford Rural Village, was identified as part of a 'Rural Economic Living Area' (RELA), in the final Jandakot Structure Plan (2007) – no constraints or environmental impacts associated with the proposed action area, suggesting there was sufficient confidence that these issues could be managed

* RELA was further developed as part of the Shire's Local Planning Policy 51 (LPP 51) (2011) - the Department of Planning (DoP) response to the policy identified only servicing constraints

* a planning report to support an amendment to the MRS (rezone from 'Rural' to 'Urban') and the Shire of Serpentine-Jarrahdale TPS (rezone from 'Rural' to 'Urban Development' was prepared by Landvision (for Kargotich Industries Pty Ltd) in 2011).

The Oakford Village development is currently the subject of a MRS Amendment, lodged in 2012, to rezone 174 ha from Rural to Urban. The lodgement of the MRS amendment received strong support and encouragement from the Shire and WAPC; however, the application was held in abeyance by the DoP pending the completion of the Strategic Environmental Assessment and the Regional Planning Framework for Perth and Peel. The draft Perth and Peel @3.5 million (Green Growth Plan) (PPGGP) and draft planning frameworks for four sub-regions were released in 2015. The proposed action area is located within the South

Metropolitan Peel Region. Despite its recognition as an area of urban development as part of the Shire's strategic vision, the proposed action area has not been identified as an area of 'Urban Expansion' in the South Metropolitan Peel sub-regional Planning Framework (SRFP). In response to the draft PPGGP, Harley Dykstra (2015) prepared a submission to include the proposed action area within the urban precinct as urban expansion as it aligns with the principles that support the draft SRPF.

**1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.**

The Department of Planning, Lands and Heritage (DPLH) Aboriginal Inquiry System (2017) was searched and no registered and other heritage site are recorded within and adjacent to the proposed action area. Due to preliminary database results and that the project is still progressing the Draft Structure Plan Concept, Indigenous stakeholder consultation with local groups has not been undertaken.

**1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.**

The Oakford Development is currently the subject of a MRS amendment, lodged in 2012, to rezone 174 ha from Rural to Urban. The lodgement of the MRS amendment received strong support and encouragement from the Shire and WAPC; however, the application was held in abeyance by the DoP pending the completion of the Strategic Environmental Assessment and the Regional Planning Framework for Perth and Peel.

**1.15 Is this action part of a staged development (or a component of a larger project)?**

Yes

**1.15.1 Provide information about the larger action and details of any interdependency between the stages/components and the larger action.**

The proposed action area is part of the Oakford Village District Structure Concept Plan which extends covering the total area of Lot 698. The proposed action area is not dependant of the progression of the southern phase of the project, as this area is subject to further planning progression.

**1.16 Is the proposed action related to other actions or proposals in the region?**

No

# Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

### 2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

### 2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

### 2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

Yes

#### 2.3.1 Impact table

| Wetlands | Impact |
|---|---|
| Peel-Yalgorup System | The proposed action area is located 30-40km upstream within the Upper Serpentine River sub-catchment of the Peel Harvey Catchment (PHC), which is a Ramsar listed site. The Water Corporation Birrega Main Drain, abuts the Eastern boundary of the proposed action area. |

| Wetlands | Impact |
| --- | --- |
| | This main drain serves an upstream catchment extending north and east to the Wungong Brook with the drain ultimately discharging into the Serpentine River and Peel Inlet (GHD, 2014:i). Nutrient concentrations in the Birrega Main Drain currently exceed targets set in the Peel Harvey Water Quality Improvement Plan (WQIP) (GHD, 2014). This catchment has been exposed to agricultural fertiliser use which contributed to high phosphorus export and inflows into the catchment. The predicted nutrient inputs from the proposed redevelopment of the proposed action area have been determined through UNDO modelling. The model results have indicated that the nutrient inputs comply with the recommended Department of Water (Kelsey et al. 2011) (now Department of Water and Environmental Regulation- DWER) input targets for the Serpentine catchment (kg/ha/yr) and provide a significant reduction from current loads under existing rural landuses. |

### 2.3.2 Do you consider this impact to be significant?

No

### 2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

### 2.4.1 Impact table

| Species | Impact |
| --- | --- |
| Calyptorhynchus banksii (Forest Red-tailed Black-Cockatoo-FRTBC) | Species/habitat may occur within the area. GHD (2011) reported that large trees such as Corymbia calophylla and Eucalyptus rudis occurred within the proposed action area. Strategen (2017) completed a black cockatoo habitat tree survey in accordance with SEWPaC (now DotEE) (2012) guidelines. The survey assessed whether there were potential |

| Species | Impact |
|---|---|
| | breeding or roosting trees with a diameter at breast height (DBH) greater than 500 mm within the proposed action area. There were 52 potential black cockatoo habitat trees located within the proposed action area of which 96% were Flooded Gum and 2% Marri. No hollows considered suitable for black cockatoo breeding/nesting were observed in any of the trees. There is approximately 0.6 ha of Very Poor Quality black cockatoo foraging habitat within the Proposed action area. |
| Calyptorhynchus baudinii (Baudin's Black-Cockatoo, Long-billed Black-Cockatoo) | Species/habitat may occur within the vicinity of the proposed action area. |
| Calyptorhynchus latirostris (Carnaby's Black-Cockatoo, Short-billed Black- Cockatoo- CBC) | Species/habitat may occur within the area. GHD (2011) reported that large trees such as Corymbia calophylla and Eucalyptus rudis occurred within the proposed action area. The following species are utilised for CBC: * Corymbia calophylla (Marri)- feeding, nesting and roosting (high). * Eucalyptus rudis (Flooded Gum)- roosting (low). Strategen (2017) completed a black cockatoo habitat tree survey in accordance with SEWPaC (now DotEE) (2012) guidelines. The survey assessed whether there were potential breeding or roosting trees with a diameter at breast height (DBH) greater than 500 mm within the proposed action area. There were 52 potential black cockatoo habitat trees located within the proposed action area of which 96% were Flood Gum and 2% Marri. No hollows considered suitable for Black Cockatoo breeding/nesting were observed in any of the trees. There is approximately 0.6ha of Very Poor Quality black cockatoo foraging habitat within the proposed action area. Based on the WAPC (2011) MRS Potential habitat for CBC mapping there are no known/recorded roosting sites within or adjacent to the proposed action area. |

**2.4.2 Do you consider this impact to be significant?**

No

**2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?**

No

**2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?**

No

**2.7 Is the proposed action to be taken on or near Commonwealth land?**

No

**2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?**

No

**2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?**

No

**2.10 Is the proposed action a nuclear action?**

No

**2.11 Is the proposed action to be taken by the Commonwealth agency?**

No

**2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?**

No

**2.13 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?**

No

# Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

**3.1 Describe the flora and fauna relevant to the project area.**

**Flora**

Based on historical aerial photography (Landgate, 2017) the proposed action area has been extensively cleared for grazing/agricultural activities since 1965 and consists of open paddocks with remnant isolated trees (i.e. Corymbia calophylla and Eucalyptus rudis) and common weed species i.e. Wild oats (Avena fatua and A. ludoviciana).

A search of Nature Map (Department of Biodiversity Conservation and Attractions- DBCA) Database and the EPBC Protection Matters Database search (2017) of the proposed action area and buffer indicated that there are several species of significance located within the vicinity of the proposed action area. These species and habitat requirement include the following:

* Caladenia huegelii (Grand Spider Orchid): Habitat- mixed woodland of jarrah and banksia, marri, scattered sheoak with (dense) undergrowth, deep grey-white sand usually associated with the Bassendean sand-dune system (DEC, 2009). Suitable habitat is not present on the proposed action area and this species is unlikely to be present within proposed action area

* Diuris purdiei (Purdie's Donkey Orchid): Habitat- This species commonly grows on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath with scattered emergent Melaleuca preissiana, Eucalyptus calophylla, E. marginata and Nuytsia floribunda (DEE, 2008). Suitable habitat is not present on the proposed action area and this species is unlikely to be present within proposed action area

* Drakaea elastica (Glossy-leaved Hammer Orchid): Habitat- grows on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps, typically in banksia woodland or spearwood thicket vegetation (DEC, 2009a). Suitable habitat is not present on the proposed action area and this species is unlikely to be present within proposed action area

* Synaphea sp. Serpentine: Habitat- Loamy soils in low lying areas that are occasionally inundated. Suitable habitat is not present on the proposed action area and this species is unlikely to be present within proposed action area.

The DBCA threatened, priority and ecological community database was also searched (December 2017). There are currently no threatened or priority species recorded within the proposed action area. Diuris purdiei (Purdie's Donkey Orchid) was recorded within Bush

Forever Site 347 which is in the vicinity of proposed action area in 2004 (Figure 4).

Based on the above, the proposed action is not expected to impact threatened flora species.

**Fauna**

A search of Nature Map (Department of Biodiversity Conservation and Attractions- DBCA) Database and the EPBC Protection Matters Database search (2017) of the proposed action area and buffer indicated that there are several species of significance located within the vicinity of the proposed action area. These species and habitat requirement include the following:

* Calidris ferruginea (Curlew Sandpiper): Habitat-curlew sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. Suitable habitat is not present on the proposed action area and this species is unlikely to be present within proposed action area

* FRTBC and CBC Habitat- 52 habitat trees on proposed action area, of which two are Marri. No hollows considered suitable for black cockatoo breeding/nesting were observed in any of the trees. The Flooded Gums within the proposed action area branched at the main trunk between 1 to 3 m which dramatically decreases the future suitability for potential breeding. There was FRTBC foraging evidence at Marri. The DBH of the potential habitat trees were:

- Forty eight (48) trees- A Class (DBH 500-1,000mm)

- Four (4) trees- B class (DBH>1,000mm)

- 0.6 ha foraging habitat (Very Poor Quality)

* Rostratula australis (Australian Painted Snipe) Habitat inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (Melaleuca) (DEE, 2017). Suitable habitat is not present in the proposed action area and this species is unlikely to be present within proposed action area

* Leioproctus douglasiellus (short tongue bee) and Neopasiphae simplicior (a native bee) Habitat: the species has been associated with the following plant species Goodenia pulchella, Velleia trinervis, Lobelia tenuior which are present within Bush Forever Site 342 (EnviroWorks Consulting, 2013) and Angianthus preissianus (DoEE, no date), which is located 6.5km north of the proposed action area. Due the cleared/grazed nature of the proposed action area it is unlikely that the herb species are present within the proposed action area and hence the associated bee species.

Based on the above, the proposed action has the potential to impact habitat trees and foraging habitat for two species of black cockatoo, FRTBC and CBC.

## 3.2 Describe the hydrology relevant to the project area (including water flows).

### Groundwater

GHD (2014) reports that the depth to groundwater varies across the proposed action area from close to the natural ground at low lying areas within the eastern and southern section of the proposed action area to depths approximately 5mbgl in the north-west section of the proposed action area (Figure 5). GHD (2014) has completed pre-development groundwater monitoring (incorporating 14 monitoring bores on proposed action area -BH1 to BH14) which support DWER regional groundwater levels, with groundwater levels ranging from 21.5 mAHD to 24 m AHD with the depth to groundwater varying from 0.5 mbgl to 6 mbgl (Figure 5).

Groundwater quality was also recorded during the predevelopment monitoring program. Total Nitrogen (TN) ranged from 0.83 mg/L to 150 mg/L (average 5.2 mg/L) and Total Phosphorus (TP) ranged from 0.06 mg/L to 6.3 mg/L within the Proposed action area. These investigations indicate that there are high nutrient levels on the proposed action area which is from long-term fertiliser application associated with agricultural activities.

### Surface water

There are several small agricultural dams within the proposed action area. The Water Corporation Birrega Main Drain, abuts the Eastern boundary of the proposed action area. This main drain serves an upstream catchment extending north and east to the Wungong Brook with the drain ultimately discharging into the Serpentine River and Peel Inlet (GHD, 2014:i).

A significant portion of the proposed action area is mapped as a Multiple Use Wetland (MUW) (UFI 15616). There are no wetlands of environmental significance within or adjacent to the proposed action area. The closest Ramsar wetland is Forrestdale Lake which is approximately 4.3km north of the proposed action area.

GHD (2014) completed surface water monitoring (between 2008 and 2009) from two sample locations within the Birrega Main Drain and one located at the inflow into the Birrega Main Drain on Abernethy Road (GHD, 2014). In general, nutrient concentration in the Birrega Main Drain exceed targets set in the Peel Harvey Water Quality Improvement Plan (WQIP) (GHD, 2014). This catchment has been exposed to agricultural fertiliser use which contributed to high phosphorus export and inflows into the catchment.

### Peel Harvey Catchment - Nutrient input and export (UNDO Modelling)

Since the 1970's, the deterioration of water quality in receiving water ways within the Peel Harvey Catchment (PHC) due to nutrient loads (inputs) has been a matter of concern. Stormwater runoff is a significant contributor to nutrient export into estuaries, wetlands and lakes on the Swan Coastal Plain (DoW 2016).

The Water Quality Improvement Plan for the Rivers and Estuary of the Peel-Harvey System - Phosphorus Management (EPA 2008, WQIP) was developed by the Environmental Protection Authority (EPA) to address issues of algal blooms in the Peel-Harvey System. The WQIP (EPA

2008) set a water quality target mean concentration of 0.1 mg/L total phosphorus (P) in the Serpentine River. The total P load for the PHC of 75 tonnes/yr used in the draft Perth and Peel Green Growth Plan for 3.5 Million (Department of Premier and Cabinet 2015) is based on the WQIP (EPA 2008).

Following the preparation of the WQIP, the Department of Water (DoW) undertook hydrological and nutrient modelling of the Peel-Harvey in 2011. Based on the outcomes of the modelling, the following advice was provided regarding nutrient input and output targets for the catchment (including the proposed action area):

1. Average nutrient input rates over all the 'developed area' of the catchment need to be less than 45 kg/ha/year for Nitrogen (N) and less than 6.5 kg/ha/year for P.

2. If the output targets are taken to be the EPA load target for P and the ANZECC total nitrogen (concentration guideline value (1.2 mg/L) for N, then for the estuary catchments (not including the Upper Murray), the P output target is 70 tonnes or 0.37 kg/ha/yr and the N output target is 454 tonnes or 2.4 kg/ha/yr (DoW 2011).

The current land use on the proposed action area, cattle grazing (agricultural activities), is associated with estimated nutrient inputs of 86.4 kg/ha/yr of N and 12.7 kg/ha/yr of P (DoW 2011).

It is difficult to prevent the nutrient pollution of waterways by stormwater, as the runoff is mostly from diffuse sources such as gardens and public open space (POS). In 2016, DoW (now Department of Water and Environmental Regulation [DWER] and referred to a such throughout) identified a gap in this area and developed Urban Nutrient Decision Outcomes (UNDO) to assess nutrient inputs and exports from urban development on the Swan Coastal Plain by modelling the effectiveness of nutrient stripping devices such as biofilters, swales and living streams (DoW 2016). The DWER model provides estimates of the nutrient outputs of a development that can be assessed against catchment targets for water quality and/or nutrient loads (DoW 2016). The tool can be used to design developments and stormwater management systems to meet nutrient targets (DoW 2016).

UNDO determines nutrient inputs and export based on:

* the size of each land use type

* the type of drainage system in use (e.g. infiltration on proposed action area, presence of subsoil drainage)

* the nutrient stripping devices proposed to remove nutrients from stormwater and groundwater.

In order to assess the potential impacts of the proposed action on water quality, Strategen completed modelling using the DWER UNDO tool.

The outcomes of the model are discussed in Section 4.

**3.3 Describe the soil and vegetation characteristics relevant to the project area.**

Regional environmental geology mapping indicates that the proposed action area comprises of a thin horizon of Bassendean Sand overlying the Guildford Formation and consists of the following soil units (Jordan, 1983):

* Sc: Clayey Sand

* S8: Sand

* S10: Sand

* Cs: Sandy Clay.

GHD (2014) report that two geotechnical investigations (Parsons Brinckerhoff (2007) and GHD (2008) confirmed consistency with region mapped of the proposed action area consisting primarily of Bassendean Sand overlying sandy/clay.

Historical aerial photography indicates that the proposed action area has been extensively cleared with isolated flooded gum and marri trees since the mid-1960s. Regional vegetation association mapping (Beard, 1990) indicates that that proposed action area was mapped between two associations:

1. 1001- Medium very sparse woodland; jarrah, with low woodland; banksia and casuarina.

2. 968 - Medium woodland; jarrah, marri and wandoo.

Heddle (1980) maps the proposed action area as occurring within the Bassendean Complex - Central and South (Figure 7).

**3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.**

Historical land uses (agricultural practices - grazing) have resulted in a highly modified environment and there are no outstanding natural features or unique values relevant to the proposed action area.

**3.5 Describe the status of native vegetation relevant to the project area.**

A preliminary vegetation and flora survey was undertaken by GHD (2011) which recorded 13 native species and 17 exotic (introduced species) within the proposed action area. The proposed action area is in Degraded condition and mainly consists of pasture grasses and remnant isolated trees.

**3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.**

Topography on the proposed action area generally falls from west to east toward Birrega Main Drain and ranges from 27 mAHD to 17 mAHD.

**3.7 Describe the current condition of the environment relevant to the project area.**

Based on GHD Assessments (2011 and 2015) and site inspection by Strategen (2017), the proposed action area is in a degraded condition due to historical and current land use activities. These uses have resulted in land degradation through clearing of vegetation, grazing, weed encroachment and fertiliser application.

**3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.**

Not applicable.

**3.9 Describe any Indigenous heritage values relevant to the project area.**

The Department of Planning Lands and Heritage (DPLH) Aboriginal Inquiry System (2017) was searched and no registered and other heritage site are recorded within and adjacent to the proposed action area.

**3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.**

Freehold.

**3.11 Describe any existing or any proposed uses relevant to the project area.**

The proposed action area is currently used for cattle grazing. The Oakford Village District Structure Plan, as per MRS and TPS amendment documentation (Land Vision, 2011) (Figure 8) proposes the following design features:

* landscape buffers

* residential (urban) clusters in rural surrounds

* local activity centre

* showroom/commercial/service hub

* district sporting facility

* Birrega Main Drain (multiple use (ecological) drainage corridor).

# Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

**4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.**

Two MNES have been identified that have the potential to be impacted by the proposed action:

1. Threatened species and communities (black cockatoo).

2. Ramsar wetland (Peel Harvey).

The measures that will be undertaken to avoid and/or reduce impacts on these MNES are discussed below.

**Black Cockatoos**

Site works required for the development may require the removal of black cockatoo habitat trees and foraging habitat across the proposed action area. If viable (subject to fill requirements and earthworks), significant habitat trees will be retained within the POS and/or rural hinterland areas (refer to Figure 8).

To assist in minimising the potential impact on black cockatoos, a Construction Environmental Management Plan with management measures will be developed and implemented during the clearing processes:

* providing measures to avoid and mitigate impacts on black cockatoo habitat following commencement of the action (during construction)

* identifying performance indicators that measure the effectiveness of avoidance and mitigation measures

* identifying the monitoring, reporting and contingency measures that will be undertaken if performance targets are not met

* identifying timeframes for the implementation of avoidance and mitigation measures

* describing of the roles and responsibilities of personnel associated with implementing avoidance and mitigation measures.

**Ramsar Wetland- Peel Harvey catchment**

In accordance with the requirements stipulated within the DWMS (GHD, 2015) finished surface levels will be at least 1.2 m above the maximum groundwater level. Therefore, where the predicted maximum groundwater levels are at or within 1.2 m of the finished surface level, adequate separation from groundwater will be required and incorporated through importation of clean fill or the provision of sub surface drainage. If appropriate, high P retention soils or other measures will be adopted to minimise nutrient export.

The modelled (UNDO) nutrient input for the re-development within the proposed action area is 39 kg/ha/yr N and 5.5 kg/ha/yr P. This is below the input target for the Serpentine sub-catchment of 40 kg/ha/yr N and 6.5 kg/ha/yr. These inputs are less than half the inputs for the current land use of cattle grazing (86.4 kg/ha/yr N and 12.7 kg/ha/yr P).

The net nutrient export from the UNDO model was:

* 1.71 kg/ha/yr N

* 0.23 kg/ha/yr P.

This is below the export targets of:

* 2.4 kg/ha/yr N

* 0.37 kg/ha/yr P (DoW 2011).

The change in land use from agricultural/grazing activities to urban will therefore significantly reduce the nutrient loads inputs from the proposed action area to the Peel Harvey Catchment. The proposed action will therefore result in a positive outcome for the Peel-Yalgorup System.

**4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.**

The environmental outcomes associated with the proposal on MNES within the proposed action area, include the following:

**Black Cockatoo**

* removal of limited number of potential habitat trees (mainly flooded gum) for CBC and FRCT. No suitable hollows were observed in the trees recorded on the proposed action area

* removal of 0.6 ha of foraging habitat.

**Peel Yalogorup Ramsar site - Nutrients**

The UNDO modelling indicates that the proposed urban re-development (Figure 8) will result in:

* more than 50% decrease in nutrient inputs on the proposed action area

* the proposed action area will achieve the nutrient input targets for the Serpentine sub-catchment (which is not currently the case)

* the proposed action area will meet the proposed export targets for the Serpentine sub-catchment (Strategen, 2017).

# Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

### 5.1.1 World Heritage Properties

No

### 5.1.2 National Heritage Places

No

### 5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

### 5.1.4 Listed threatened species or any threatened ecological community

No

### 5.1.5 Listed migratory species

No

### 5.1.6 Commonwealth marine environment

No

### 5.1.7 Protection of the environment from actions involving Commonwealth land

No

### 5.1.8 Great Barrier Reef Marine Park

No

### 5.1.9 A water resource, in relation to coal/gas/mining

No

### 5.1.10 Protection of the environment from nuclear actions

No

### 5.1.11 Protection of the environment from Commonwealth actions

No

### 5.1.12 Commonwealth Heritage places overseas

No

### 5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

**Black cockatoo habitat**

The proposed action may impact upon potential foraging habitat of two black cockatoo species (FRTBC and CBC). As such, there are two relevant Commonwealth policy documents which provide guidance to evaluate the significance of impacts on black cockatoo species. These are:

1. DSEWPaC (2012) EPBC Act 1999: Referral Guidelines for three threatened black-cockatoo species.

2. DEWHA (2009) Matters of National Environmental Significance, Significant Impact Guidelines 1.1.

An assessment of potential impacts to black cockatoo species against the significant impact criteria is provided below.

Will the action lead to a long-term decrease in the size of a population?

The proposed action will not lead to a long-term decrease in the size of a population. The proposed action will result in the removal of approximately 0.6 ha of potential foraging habitat and up to 52 potential breeding trees for black cockatoos. The proposed clearing will not lead to a long-term decrease in the size of black cockatoo populations due to:

* the residual presence of large areas of vegetation within the locality and region (i.e. Bush Forever No. 347 - located north of Thomas road along the proposed action area north western cadastral boundary, Bush Forever 348 - located 1 km south west of the proposed action area, Bush Forever Site 65 - located 3 km east of the proposed action area

* the nature of black cockatoo populations, which are highly mobile with extensive ranges on the Swan Coastal Plain

* there are no known breeding trees or trees with suitable hollows within the proposed action

area.

Will the action reduce the area of occupancy of the species?

The proposed action will not reduce the area of occupancy of the species. The potential black cockatoo foraging habitat present on the proposed action area is very poor quality. The proposed action area is located in close proximity to a number of existing reserves containing potential Black-Cockatoo habitat, including Jandakot Regional Park (20m) and Wungong Regional Park (8km). As such, the proposed action will not reduce the area of occupancy of the species.

Will the action fragment an existing population into two or more populations?

The proposed action area consists of a cleared and highly modified environment within a rural/agricultural setting is not known to provide roosting or breeding habitat for black cockatoos and does not provide important foraging habitat for black cockatoos due the foraging quality.

Will the action adversely affect habitat critical to the survival of a species?

The proposed action area contains very poor quality potential foraging habitat for black cockatoos. However, there are no known breeding or roosting sites within the proposed action area. As such, the action will not adversely affect habitat critical to the survival of the species.

Will the action disrupt the breeding cycle of a population?

While there will be removal of potential habitat trees (mainly flood gum) for CBC and FRCT, no trees contained suitable hollows. On this basis, the proposed action will not disrupt the breeding cycle of a population.

Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?

No, the proposed action area is highly degraded and when surveyed in 2011 there were 17 exotic (introduced species) weed species recorded, of which two where declared pests in WA i.e. Moraea flaccida and Solanum linnaeanum. Weed species will be treated and managed as part of the redevelopment of the proposed action area.

Will the action introduce disease that may cause the species to decline?

A dieback survey has not been completed for the proposed action area, however, due to the cleared nature of the proposed action area and a lack of indicator species, the interpretation of potential dieback infestation would be negligible. It is unlikely that the redevelopment of the proposed action area will involve any actions that may cause the introduction of new diseases that would affect to black cockatoos and cause their decline.

Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat

to the extent that the species is likely to decline?

The loss of very poor quality habitat as a result of the proposed action represents only a very small portion of the potential habitat available in the vicinity of the proposed clearing. Black-cockatoos are highly mobile species; therefore, the proposed action will not present a barrier to movement across the region to better quality associated with the Jandakot Regional Park which is adjacent to the proposed action area.

Will the action interfere with the recovery of the species?

The proposed action will not interfere with the recovery of black cockatoo species as suitable black cockatoo habitat is retained in a number of existing reserve, Jandakot Regional Park and other Bush Forever sites located in proximity to the proposed action area, including Bush Forever Site 348 - located 1 km south west of the proposed action area and Bush Forever Site 65- located 3 km east of the proposed action area.

**Ramsar- Peel Yalgorup**

As presented within the outcomes of the UNDO model, the proposed urban redevelopment will result in the following outcomes:

* more than 50% decrease in nutrient inputs within the proposed action area

* the proposed action area will achieve the nutrient input targets for the Serpentine sub-catchment (which is not currently the case)

* the proposed action area will achieve the proposed export targets for the Serpentine sub-catchment.

It can therefore be concluded that there will be significantly less nutrient export loads from the proposed action area when redeveloped in accordance with the district structure plan providing a positive environmental benefit to the Peel-Yalgorup Ramsar site (Figure 8).

# Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

**6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.**

The person taking the action is a developer. Humich has never been prosecuted or experienced any type of regulatory issues. When designing they endeavour to incorporate sustainability measures into their procedures.

**6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.**

None.

**6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?**

No

**6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?**

No

# Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

### 7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

| Reference Source | Reliability | Uncertainties |
|---|---|---|
| Beard JS 1990, Plant Life of Western Australia. Kangaroo Press, Kenthurst, New South Wales. | Reliable. | Nil. |
| Department of Environment and Conservation, 2009. Grand Spider Orchid (Caladenia huegelii) Recovery Plan. Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra. | Reliable. | Nil. |
| Department of Environment and Conservation, 2009a. Glossy-leafed Hammer Orchid (Drakaea elastica) Recovery Plan. Department of Environment and Conservation, Western Australia. | Reliable. | Nil. |
| Department of Environment and Energy, 2008. Approved Conservation Advice for Diuris purdiei (Purdie's Donkey-orchid. | Reliable. | Nil. |
| Department of Environment and Energy, 2017. Rostratula australis — Australian Painted Snipe. Species Profile and Threats Database [online] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=77037. | Reliable. | Nil. |
| Department of Environment and Energy, no date. Neopasiphae simplicior (a short-tongued | Reliable. | Nil. |

| Reference Source | Reliability | Uncertainties |
|---|---|---|
| bee). Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendments to the list of Threatened Species under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). | | |
| Department of Water (DoW) 2011, Hydrological and Nutrient Modelling of the Peel-Harvey Catchment, DoW Perth. | Reliable. | Nil. |
| Department of Water (DoW) 2016, Urban Nutrient Decision Outcomes (UNDO) Tool User Guide, Department of Water, Perth. | Reliable. | Nil. |
| EnviroWorks, 2013. Public Environmental Review: Keane Road Strategic Link. Prepared for the City of Armadale, Perth. | Reliable. | Nil. |
| Environmental Protection Authority (EPA) 2008, Water Quality Improvement Plan for the Rivers and Estuary of the Peel-Harvey System - Phosphorus Management, EPA, Perth. | Reliable. | Nil. |
| Jordan, 1986. Armadale part sheets 2033I and 2133 IV. Perth Metropolitan Region, Environmental Geology Series, Geological Survey of Western Australia. | Reliable. | Nil. |
| Heddle EM, Loneragan OW & Havel JJ 1980, Darling System, Vegetation Complexes, Forest Department, Perth. | Reliable. | Nil. |
| Kelsey, P, Hall, J, Kretschmer, P, Quinton, B & Shakya D, 2011, Hydrological and nutrient modelling of the Peel-Harvey catchment, Water Science Technical Series, Report no. | Reliable. | Draft. |

| Reference Source | Reliability | Uncertainties |
|---|---|---|
| 33, Department of Water, Western Australia. | | |
| Department of the Premier and Cabinet, 2015. Perth and Peel Green Growth Plan for 3.5 Million. | Reliable. | Nil. |
| Harley Dykstra, 2015. Draft South Metropolitan Peel Sub-Regional Planning Framework + Perth & Peel@3.5million. Submission Regarding Lots 196, 197, 213 & 698 Nicholson Rd, Oakford. | Reliable. | Nil. |
| GHD, 2011 Report for Oakford Village: Preliminary Environmental Review. Prepared for Kargotich Industries. | Reliable. | Nil. |
| GHD, 2014. Oakford Village; District Water Management Strategy. Prepared for Kargotich Industries. | Reliable. | Draft. |
| Landgate, 2017. Online aerial photography [online] https://www0.landgate.wa.gov.au/maps-and-imagery/imagery/aerial-photography/aerial. | Reliable. | Nil. |
| Landvision, 2011. Oakford Village Planning Report – Proposed MRS and TPS Amendment. Prepared for Kargotech Industries Pty Ltd. | Reliable. | Nil. |
| Strategen, 2017. Oakford Village: Nutrient Modelling. | Reliable. | Draft. |
| WAPC, 2011. Metropolitan Region Scheme (MRS) - potential habitat for the Carnaby's Black Cockatoo which may require further assessment. | Reliable. | Potentially out-dated (from 2010). |

# Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

**8.1 Select the relevant alternatives related to your proposed action.**

**8.27 Do you have another alternative?**

# Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

**9.0 Is the person proposing to take the action an Organisation or an Individual?**

Organisation

**9.2 Organisation**

**9.2.1 Job Title**

Manager

**9.2.2 First Name**

Randal

**9.2.3 Last Name**

Humich

**9.2.4 E-mail**

admin@humich.com.au

**9.2.5 Postal Address**

PO Box 212
South Fremantle WA 6162
Australia

**9.2.6 ABN/ACN**

ABN

57202640173 - K.J HUMICH & HUMICH NOMINEES PTY. LTD.

**9.2.7 Organisation Telephone**

(08) 9335 5430

**9.2.8 Organisation E-mail**

admin@humich.com.au

**9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:**

Not applicable

**Small Business Declaration**

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date: .....

**9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations**

No

**9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made**

**Person proposing the action - Declaration**

I, Ronda Humich, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:..... Date: 13/2/18

I, Ronda Humich, the person proposing the action, consent to the designation of Humich Nominees P/L as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:..... Date: 13/2/18

**9.3 Is the Proposed Designated Proponent an Organisation or Individual?**

Organisation

**9.5 Organisation**

**9.5.1 Job Title**

Manager

**9.5.2 First Name**

Randal

**9.5.3 Last Name**

Humich

**9.5.4 E-mail**

admin@humich.com.au

**9.5.5 Postal Address**

PO Box 212
South Fremantle WA 6162
Australia

**9.5.6 ABN/ACN**

ABN

57202640173 - K.J HUMICH & HUMICH NOMINEES PTY. LTD.

**9.5.7 Organisation Telephone**

(08) 9335 5430

**9.5.8 Organisation E-mail**

admin@humich.com.au

**Proposed designated proponent - Declaration**

I, Humich Nominees P/L, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature:..... Date: 7/2/2018

**9.6 Is the Referring Party an Organisation or Individual?**

Organisation

**9.8 Organisation**

**9.8.1 Job Title**

Chief Executive Officer and Managing Partner

**9.8.2 First Name**

Darren

**9.8.3 Last Name**

Walsh

**9.8.4 E-mail**

d.walsh@strategen.com.au

**9.8.5 Postal Address**

PO Box 243
Subiaco WA 6904
Australia

**9.8.6 ABN/ACN**

ABN

32056190419 - STRATEGEN ENVIRONMENTAL CONSULTANTS PTY LTD

**9.8.7 Organisation Telephone**

08 9380 3100

**9.8.8 Organisation E-mail**

info@strategen.com.au

**Referring Party - Declaration**

I, DARREN WARSH, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature:..... Date: 12/2/17.

## Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. epbc_database_search.pdf
2. figure_1_site_location.pdf
3. figure_2_site_regional_context.pdf
4. figure_3_black_cockatoo_habitat.pdf
5. figure_4_threatened_priority_and_ecological_communities.pdf
6. figure_5_hydrology.pdf
7. figure_6_drainage_catchments_and_undo_modelling.pdf
8. figure_7_regional_vegetation_mapping.pdf
9. figure_8_oakford_village_district_structure_plan.pdf
10. ghd_2014_dwms_part_1_of_8.pdf
11. ghd_2014_dwms_part_2_of_8.pdf
12. ghd_2014_dwms_part_3_of_8.pdf
13. ghd_2014_dwms_part_4_of_8.pdf
14. ghd_2014_dwms_part_5_of_8.pdf
15. ghd_2014_dwms_part_6_of_8.pdf
16. ghd_2014_dwms_part_7_of_8.pdf
17. ghd_2014_dwms_part_8_of_8.pdf
18. jdap_report.pdf
19. naturemap_database_search.pdf
20. undo_model_report_reduced.pdf