



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

<b>Purpose Permit number:</b>	CPS 10149/1
<b>Permit Holder:</b>	City of Belmont
<b>Duration of Permit:</b>	From 14 July 2023 to 14 July 2028

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

### **PART I – CLEARING AUTHORISED**

#### **1. Clearing authorised (purpose)**

The permit holder is authorised to clear *native vegetation* for the purpose of clearing *Typha*.

#### **2. Land on which clearing is to be done**

Lot 33 on Diagram 49255, Belmont  
Lot 100 on Diagram 37352, Belmont

#### **3. Clearing authorised**

The permit holder must not clear more than 0.15 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

### **PART II – MANAGEMENT CONDITIONS**

#### **4. Avoid, minimise, and reduce impacts and extent of clearing**

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- avoid the clearing of *native vegetation*;
- minimise the amount of *native vegetation* to be cleared; and
- reduce the impact of clearing on any environmental value.

## 5. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

## 6. Erosion management

The permit holder must conduct clearing authorised under this permit when the basin within area cross-hatched yellow in Figure 1 of Schedule 1 is dry.

## 7. Directional clearing

The permit holder must:

- (a) conduct clearing authorised under this permit in one direction towards adjacent *native vegetation*; and
- (b) allow a reasonable time for fauna present within the area being cleared to move into adjacent *native vegetation* ahead of the clearing activity.

## 8. Fauna Management

- (a) Prior to undertaking any clearing authorised under this permit, the permit holder must inspect the area authorised to be cleared under this permit prior to works commencing and for the duration of clearing for any native fauna that may be present.
- (b) Where fauna have been identified under condition 8(a), works must cease until the fauna have escaped into adjacent habitat ahead of the clearing activity or translocated into *native vegetation*.

## **PART III - RECORD KEEPING AND REPORTING**

### 9. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

**Table 1: Records that must be kept**

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ol style="list-style-type: none"><li>(a) the species composition, structure, and density of the cleared area;</li><li>(b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020),</li></ol>

No.	Relevant matter	Specifications
		<p>expressing the geographical coordinates in Eastings and Northings</p> <p>(c) the date that the area was cleared</p> <p>(d) the size of the area cleared (in hectares);</p> <p>(e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4</p> <p>(f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5</p> <p>(g) actions taken to mitigate erosion risk in accordance with condition 6 of this permit</p> <p>(h) actions taken to mitigate fauna impacts in accordance with condition 7 of this permit; and</p> <p>(i) fauna management actions undertaken in accordance with condition 8.</p>

## 10. Reporting

The permit holder must provide to the *CEO* the records required under condition 9 of this permit when requested by the *CEO*.

## DEFINITIONS

In this permit, the terms in Table have the meanings defined.


**Table 2: Definitions**

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 2.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
fill	means material used to increase the ground level, or to fill a depression.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
Typha	means one or more of the following plant species: (a) <i>Typha domingensis</i> ; or

Term	Definition
	(b) <i>Typha orientalis</i> .
weeds	means any plant – (c) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (d) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (e) not indigenous to the area concerned.

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**END OF CONDITIONS**


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Juraj Galba  
 A/MANAGER  
 NATIVE VEGETATION REGULATION

*Officer delegated under Section 20  
 of the Environmental Protection Act 1986*

20 June 2023

# Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

## CPS 10149/1



**Figure 1:** Map of the boundary of the area within which clearing may occur.



# Clearing Permit Decision Report

## 1 Application details and outcome

### 1.1. Permit application details

Permit number:	CPS 10149/1
Permit type:	Purpose permit
Applicant name:	City of Belmont
Application received:	13 April 2023
Application area:	0.15 hectares of native vegetation
Purpose of clearing:	Clearing of <i>Typha</i> species
Method of clearing:	Mechanical
Property:	Lot 33 on Diagram 49255, Belmont Lot 100 on Diagram 37352, Belmont
Location (LGA area/s):	City of Belmont
Localities (suburb/s):	Belmont

### 1.2. Description of clearing activities

The area to be cleared is 0.15 hectares of native vegetation within a clearing footprint of 0.26 hectares contained within a single area (see Figure 1, Section 1.5). The application is to selectively clear *Typha* species within a basin to reduce flooding and allow for proper drainage through the basin. The clearing will involve mechanical shallow excavation or scraping with slashing of *Typha* sp.

### 1.3. Decision on application

Decision:	Granted
Decision date:	19 June 2023
Decision area:	0.15 hectares of native vegetation, as depicted in Section 1.5, below.

### 1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 14 days. No submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3.3 of this report).

The Delegated Officer also took into consideration that the purpose of the clearing is to remove *Typha* sp., an invasive native species capable of aggressive invasions that can transform ecosystems and clog drainage channels unless it is actively managed (Western Australian Herbarium 1998-), to increase water drainage in the area and reduce flooding. It is not expected that the removal of *Typha* sp. to maintain the basin will result in significant impacts to environmental values in the application area. Given the previously disturbed nature of the basin where *Typha* is

required to be removed, it is considered unlikely that any flora of conservation significance would be located in or adjacent to the basin.

The department's assessment has identified that the proposed clearing will result in:

- the loss of native vegetation that may provide suitable habitat for the blue billed duck (*Oxyura australis*)
- impacts to vegetation in an area that has been extensively cleared; and
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to appreciable land degradation or significant impacts to the blue billed duck. The applicant has suitably demonstrated avoidance and minimisation measures.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- clear only *Typha* sp.
- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds
- scheduling works when the application area is dry to minimise soil erosion and the amount of native fauna that may be using the basin at the time of clearing
- undertake slow, progressive one directional clearing to allow fauna to move into adjacent habitat ahead of the clearing activity; and
- pre-clearing site inspections prior to works commencing and ongoing during works for any fauna that may be present. If found and are not able to escape to adjacent habitat, the City of Belmont is to cease works until the identified fauna has been translocated.

1.5. Site map

CPS 10149/1

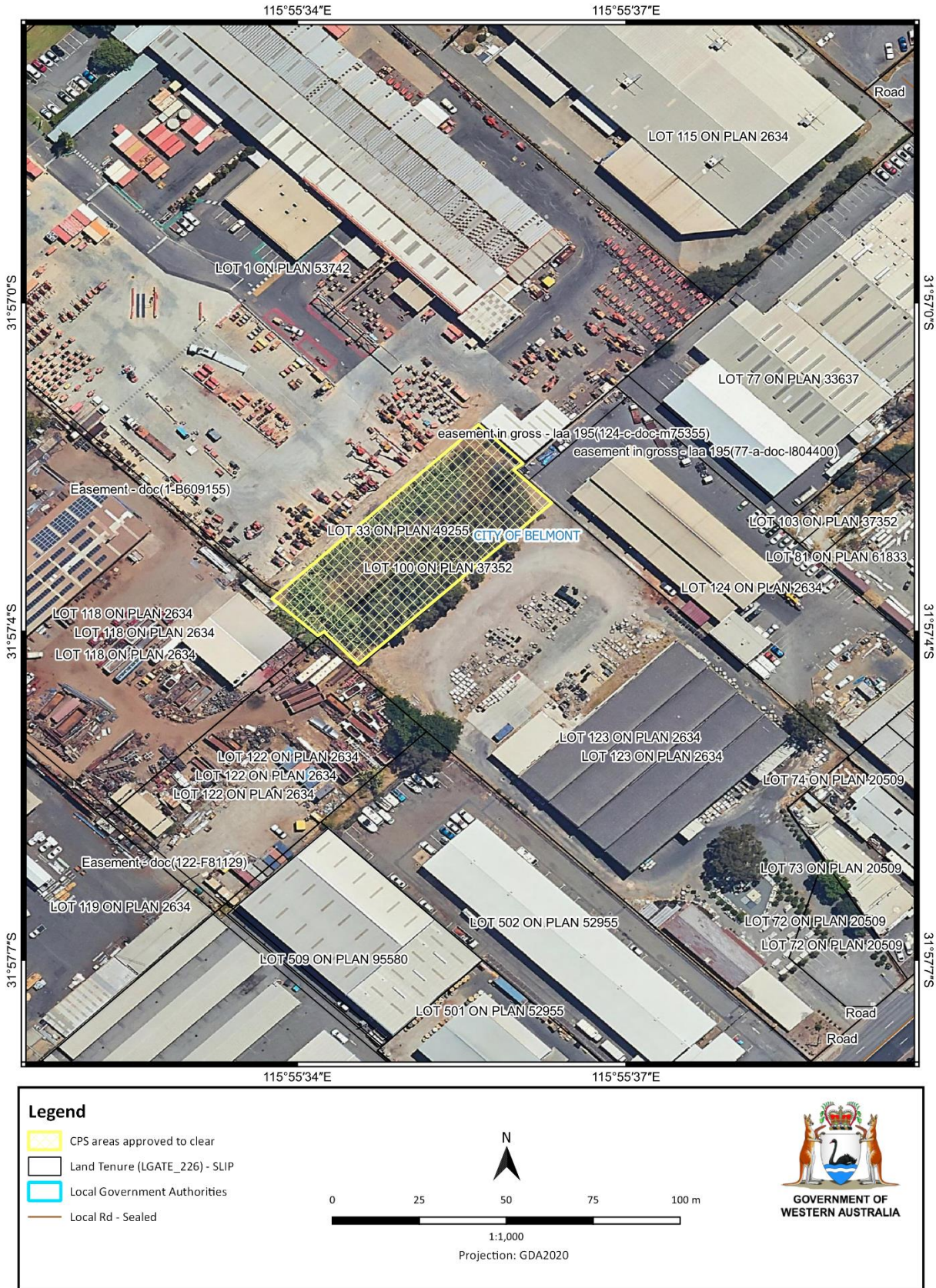


Figure 1 Map of the application area

The area crosshatched yellow indicate the area authorised to be cleared under the granted clearing permit.



## 2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity; and
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act); and
- *Soil and Land Conservation Act 1945* (WA).

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013); and
- *Procedure: Native vegetation clearing permits* (DWER, October 2019).

## 3 Detailed assessment of application

### 3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant, demonstrating that only Typha would be cleared. In addition, City of Belmont has committed to engaging suitably qualified arborists to establish tree protection zones around the mature Eucalyptus trees along the bank of the basin to restrict machinery access and minimise the extent of root disturbance.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

### 3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix E) identified that the impacts of the proposed clearing present a risk to biological values flora, fauna and significant remnant vegetation and land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

#### 3.2.1. Biological values (Flora) - Clearing Principles (a, c)

##### Assessment

According to available datasets, none of the 102 conservation significant flora recorded in the local area have been found within the application area. Noting the site characteristics, the application area may provide habitat for the species which tend to occupy wetland habitats. However, given the disturbed nature of the proposed clearing areas and dominance of Typha, it is unlikely that flora species of conservation significance or Threatened or Priority ecological communities occur within the application area.

Typha is capable of aggressive invasions that can transform ecosystems unless it is actively managed (Western Australian Herbarium 1998-). Without management, Typha can develop quickly into a monoculture and cover an entire water body. The proposed clearing is to reduce the rate of spread of Typha. Dense stands of Typha will be controlled by mechanical shallow excavation or scraping with slashing of Typha. The City will engage an arborist to establish a tree protection zone for all mature trees in, and adjacent to, the application area.

##### Conclusion

Based on the above assessment, the proposed clearing is unlikely to result in a significant loss in biodiversity or impact to conservation significant flora. Suitable habitat for species listed in Appendix B.3 is unlikely to be significantly impacted by the proposed clearing.

### 3.2.2. Biological values (Fauna) - Clearing Principles (b)

#### Assessment

According to available datasets, none of the 62 conservation significant fauna recorded in the local area have been found within the application area. The application area may provide suitable habitat for 13 conservation significant fauna which tend to occupy wetland habitats.

The application area may provide habitat for the following 10 migratory species. However, given the disturbed nature of the proposed clearing areas and dominance of *Typha*, the application area unlikely provides significant habitat for these species:

- the common sandpiper (*Actitis hypoleucos*)
- sharp-tailed sandpiper (*Calidris acuminata*)
- pectoral sandpiper (*Calidris melanotos*)
- red-necked stint (*Calidris ruficollis*)
- long-toed stint (*Calidris subminuta*)
- eastern osprey (*Pandion cristatus*)
- crested tern (*Thalasseus bergii*)
- wood sandpiper (*Tringa glareola*)
- common greenshank (*Tringa nebularia*); and
- marsh sandpiper (*Tringa stagnatilis*).

The Australasian bittern (*Botaurus poiciloptilus*) is an endangered species with seven records in the local area dating back to 1979. This species, favours permanent freshwater wetlands with tall, dense vegetation, particularly *Eleocharis* spp (Spike rushes) and *Typha* (Department of Biodiversity, Conservation and Attractions (DBCA), 2018). The species is known to breed in Spring-Summer, with egg laying known to occur in September to December (DBCA, 2021). Since the 1980s the species has been known only from the southern Perth metropolitan area near Forrestdale Lake, James Swamp and Thomsons Lake, although it may visit areas outside of its current range (DBCA, 2018). Noting the above, the proposed clearing is unlikely to significantly impact the Australasian bittern.

The Australian little bittern (*Ixobrychus dubius*) is a Priority 4 species with one record 3.36 kilometres from the application area. This species has similar habitat requirements to the Australasian bittern mainly where tall rushes, reeds, *Typha*, shrub thickets or other dense cover is inundated by at least 30 centimetres of water. It can be found in extensive swamps, but often inhabits small patches of dense wetland vegetation such as *Typha* along drains or in small urban lakes (Bird life Australia, 2020b). Little bittern can occur as a migrant in south-west Australia from late August to early April, breeding in the north of the state in winter (Bird life Australia, 2020b). Little bittern may visit wetlands on the Swan Coastal Plain (DBCA, 2021). There is a possibility of the species occurring within the application area. However, noting the small extent of the proposed clearing, it is unlikely to have significant impacts on the Australian little bittern.

The Priority 4 blue billed duck (*Oxyura australis*) has 390 records in the local area with the closest approximately 630 metres from the application area. This species can breed from August to March, mostly between October to January (DBCA, 2021). Breeding habitat is typically secluded densely vegetated situations, with the nest constructed in *Typha* beds or other vegetation, in permanent water. Nests are usually constructed from dead *Typha* leaves and sometimes thinly lined with down (Birdlife Australia, 2020a). Noting the small extent of the proposed clearing and that better quality breeding habitat are likely to occur within the local area, the proposed clearing is unlikely to have significant impacts on the blue billed duck.

#### Conclusion

Based on the above assessment, stands of *Typha* may provide breeding habitat and a source of nest building material for Blue billed duck. There is a low probability that Australasian bittern and Australian little bittern may temporarily use the application area as foraging habitat. It is considered that the impacts of the proposed clearing can be managed by conducting slow directional clearing. Scheduling works when the asset is dry will also decrease the likelihood of fauna being present at the time of clearing.

#### Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit.

- undertake slow, progressive one directional clearing to allow fauna to move into adjacent habitat ahead of the clearing activity
- schedule works when the clearing area is dry; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

### **3.2.3. Significant remnant vegetation - Clearing Principles (e)**

#### Assessment

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The Environmental Protection Authority (EPA) recommends a minimum ten per cent representation threshold for ecological communities in constrained areas 'where there is a reasonable expectation that development will be able to proceed' (EPA, 2008).

The application area is in a degraded condition and located within the Perth Metropolitan Region Scheme boundary, which the EPA recognises to be a constrained area.

The mapped vegetation Bassendean complex, central and south retains more than ten per cent of their pre-European extent remaining at 26.87 per cent. The local area retains less than ten per cent of its pre-European native vegetation cover at 7.28 per cent and is considered to be extensively cleared. However, considering the targeted nature of Typha removal, the proposed clearing is unlikely to further degrade remnants of native vegetation in an area that has been extensively cleared.

#### Conclusion

Although located within an area which has been extensively cleared, for the reasons set out above, the application area is not considered to be significant as a remnant of native vegetation.

#### Conditions

It is considered that the impacts outlined above can be managed. To address these impacts, the following management measures will be required as conditions on the clearing permit:

- clearing of only *Typha* sp.
- avoid and minimise clearing, to minimise the direct impacts to native vegetation; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback into adjacent native vegetation.

### **3.2.4. Land and water resources - Clearing Principles (f, g, i, j)**

#### Assessment

The proposed clearing is for the purpose of controlling Typha due to its invasive nature and adverse impacts on wetlands in the absence of management. Given the proposed clearing will target Typha, the proposed clearing is not likely to result in any long-term impact to the ecological values of the riparian vegetation community within the application area.

The soil units mapped within the application area indicated a high risk of wind erosion, water repellence, waterlogging, subsurface acidification and phosphorus export risk. Given the selective clearing and that Typha has been found to assist in neutralising acidity on re-wetting in areas that are prone to acid sulphate soils, the proposed clearing is unlikely to cause an appreciable increase to the existing risks of wind erosion, subsurface acidification, phosphorus export and flooding (DBCA, 2019).

The removal of Typha has the potential to increase sedimentation and turbidity the water within the application area, thereby possibly impacting surface water quality. However, due to the small scale of the clearing, it is not likely to cause long-term deterioration in the quality of surface water. Given the invasiveness of Typha, the proposed clearing may improve drainage of water and reduce the incidence or intensity of flooding.

#### Conclusion

The proposed clearing will not significantly impact the vegetation and is expected to enhance the habitat within the application area through the removal of Typha as the increased water drainage will reduce the risk of flooding. The selective clearing of Typha within the application area is not likely to lead to appreciable land degradation in the form of subsurface acidification, phosphorus export or wind erosion. No management conditions are required in relation to this environmental value.

### 3.3. Relevant planning instruments and other matters

The application area falls within the Perth Groundwater Area, as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). DWER's Water Licencing branch advised that a water licence or permit may be required to undertake the clearing proposed (DWER, 2023). The applicant confirmed that no groundwater would be removed to clear *Typha* sp.

It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

**End**

## Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Applicant provided photographs of the proposed clearing area (City of Belmont, 2023).	Photographs have been displayed in Appendix E.

## Appendix B. Site characteristics

### B.1. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix C.

Characteristic	Details
Local context	<p>The area proposed to be cleared is a 0.26-hectare isolated patch of native vegetation in the intensive land use zone of Western Australia. It occurs within a business zone and provides a drainage basin for the surrounding businesses.</p> <p>Aerial imagery indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 7.28 per cent of the original native vegetation cover.</p>
Ecological linkage	There is no ecological linkages within the application area. Perth regional ecological linkage is mapped approximately 40 metres from the application area.
Conservation areas	The closest conservation area is the Swan River approximately 780 metres away from the application area.
Vegetation description	<p>Photographs supplied by the applicant indicate the vegetation within the proposed clearing area consists of <i>Typha</i> species and mature <i>Eucalyptus</i> sp. Representative photos are available in Appendix E.</p> <p>The application area likely represents a degraded patch of the mapped vegetation type:</p> <ul style="list-style-type: none"> <li>Bassendean Complex – Central and South from Heddle et al. 1980, which is described as vegetation ranges from woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Allocasuarina fraseriana</i> (Sheoak) - Banksia species to low woodland of Melaleuca species, and sedgelands on the moister sites. This area includes the transition of <i>Eucalyptus marginata</i> (Jarrah) to <i>Eucalyptus todtiana</i> (Pricklybark) in the vicinity of Perth.</li> </ul> <p>The mapped vegetation type retains approximately 26.87 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>Photographs supplied by the applicant indicate the vegetation within the proposed clearing area is in a degraded condition (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix D. Representative photos are available in Appendix E.</p>
Climate and landform	<p>The climate is classified as Mediterranean, with dry, hot summers and cool, wet winters</p> <ul style="list-style-type: none"> <li>average rainfall is 759.7 mm per year, with the majority falling between May and August</li> <li>average maximum temperature ranges from 18 degrees in July to 32 degrees in February</li> <li>average minimum temperature ranges from 8.1 degrees in July and August to 17.6 in February (BOM 2023).</li> </ul> <p>The stand of <i>Typha</i> comprises one landform, the Bassendean system which is described as Swan Coastal Plain from Busselton to Jurien. Sand dunes and</p>

Characteristic	Details
	sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heaths.
Soil description	The soil is mapped as <ul style="list-style-type: none"> <li>• EnvGeol S8 phase, which is described as sand very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin; and</li> <li>• EnvGeol Cps phase, which is described as peaty clay, dark grey and black, soft, variable organic content, some quartz sand in places, of lacustrine origin.</li> </ul>
Land degradation risk	The land degradation risk varies between the two soil types with high wind erosion, water repellence and subsurface acidification risks for EnvGeol S8 Phase and waterlogging, subsurface acidification and phosphorus export risk for EnvGeol Cps phase. There is a low risk of water erosion, salinity and flood risk. See B.5. Land degradation risk table.
Waterbodies	The desktop assessment and aerial imagery indicated that it is in a consanguineous wetland suite and is a manmade drain.
Hydrogeography	The application area is mapped within the 500-1000 salinity zone and does not occur within areas proclaimed under the CAWS act or RIWI Act.
Flora	A total of 102 conservation significant flora are recorded in the local area with the closest record being 1.5 kilometres from the application area. A total of 38 records are within the same soil type, of which 30 in the same vegetation type as the application area. There are nine conservation significant flora that are likely to occur in the application area.
Ecological communities	There are no Priority ecological community or Threatened ecological community in the application area, the closest, the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region is mapped approximately 740 metres from the application area.
Fauna	There are 62 records of conservation significant fauna in the local area with the nearest record being approximately 400 metres from the application area. There are 13 conservation significant fauna with a high likelihood of occurrence with none occurring in the application area.

## B.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex					
Hedde complex - Swan Coastal Plain – Aeolian Deposits – Bassendean Complex – Central and South**	87,476.26	23,508.66	26.87	4,377.36	5.00
Local area					
10km radius	29638.4	2157.9	7.28	-	-

\*Government of Western Australia (2019a)

\*\*Government of Western Australia (2019b)

### B.3. Flora analysis table

Species name	Conservation status	Suitable soil type? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Bolboschoenus fluviatilis</i>	1	Y	Y	4.84	4	N/A
<i>Byblis gigantea</i>	3	Y	Y	2.79	18	N/A
<i>Calandrinia uncinella</i>	1	Y	Y	9.23	3	N/A
<i>Conospermum undulatum</i>	T	Y	Y	1.50	138	N/A
<i>Cyathochaeta teretifolia</i>	3	Y	Y	5.09	3	N/A
<i>Dampiera triloba</i>	3	Y	Y	5.09	2	N/A
<i>Levenhookia preissii</i>	1	Y	Y	3.23	23	N/A
<i>Stylidium paludicola</i>	3	Y	Y	8.56	1	N/A
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	4	Y	Y	1.85	36	N/A

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

### B.4. Fauna analysis table

Species name	Common Name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Year recorded	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Actitis hypoleucos</i>	Common sandpiper	MI	Y	9.85	1976	1	N/A
<i>Botaurus poiciloptilus</i>	Australasian bittern	EN	Y	3.96	1979	7	N/A
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	Y	3.96	1999	4	N/A
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	Y	1.63	1992	1	N/A
<i>Calidris ruficollis</i>	Red-necked stint	MI	Y	3.89	2004	28	N/A
<i>Calidris subminuta</i>	Long-toed Stint	MI	Y	8.67	1991	1	N/A
<i>Ixobrychus dubius</i>	Australian little bittern	P4	Y	3.36	2012	1	N/A
<i>Oxyura australis</i>	Blue-billed duck	P4	Y	0.63	2013	390	N/A
<i>Pandion cristatus</i>	eastern osprey	MI	Y	1.93	2016	16	N/A
<i>Thalasseus bergii</i>	Crested tern	MI	Y	0.83	2013	175	N/A
<i>Tringa glareola</i>	Wood sandpiper	MI	Y	6.67	1992	5	N/A
<i>Tringa nebularia</i>	Common greenshank	MI	Y	1.07	2005	23	N/A
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	Y	3.96	1977	2	N/A

## B.5. Land degradation risk table

Risk categories	EnvGeol S8 Phase	EnvGeol Cps phase
Wind erosion	H1	M1
Water erosion	L1	L1
Waterlogging	L2	H2
Water repellence	H2	M1
Salinity	L1	L1
Subsurface Acidification	H2	H2
Flood risk	L1	L1
Phosphorus export risk	M2	H2

L1: <3% of map unit has a high to extreme risk, L2: 3-10% of map unit has a high to extreme risk, M1: 10-30% of map unit has a high to extreme risk, M2: 30-50% of map unit has a high to extreme risk, H1: 50-70% of map unit has a high to extreme risk, H2: >70% of map unit has a high to extreme risk

## Appendix E. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><b>Principle (a):</b> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing will target stands of Typha. This species is capable of aggressive invasions that can transform ecosystems unless it is actively managed (Western Australian Herbarium 1998-). Typha can quickly develop into a monoculture and cover an entire water body. Given the application area comprises predominantly of <i>Typha sp.</i>, it is not anticipated that the proposed clearing will significantly impact biodiversity within the application area. Given the disturbed nature of the proposed clearing area and dominance of Typha, it is unlikely that flora species of conservation significance or Threatened or Priority ecological communities occur within the application area.</p>	Not likely to be at variance	Yes  Refer to Section 3.2.1, above.
<p><b>Principle (b):</b> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared may contain habitat for conservation significant fauna, including the Priority 4 blue-billed duck.</p>	May be at variance	Yes  <i>Refer to Section 3.2.2, above.</i>
<p><b>Principle (c):</b> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>Given the disturbed nature of the proposed clearing area and dominance of Typha, it is unlikely that Threatened flora species occur within the application area.</p>	Not likely to be at variance	Yes  <i>Refer to Section 3.2.1, above.</i>
<p><b>Principle (d):</b> <i>“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.”</i></p> <p><u>Assessment:</u></p>	Not at variance	No



Assessment against the clearing principles	Variance level	Is further consideration required?
The area proposed to be cleared does not contain species that can indicate a threatened ecological community.		
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation type is inconsistent with the national objectives and targets for biodiversity conservation in Australia. Considering the targeted nature of Typha removal, the proposed clearing is unlikely to further degrade remnants of native vegetation in an area that has been extensively cleared. The application area is not considered to be significant as a remnant of native vegetation.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
<b>Environmental value: land and water resources</b>		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>Given the application area is a manmade basin that is at least partially inundated during the year and has wetland species, the proposed clearing is growing in an environment associated with a wetland. However, Typha can dominate wetland ecosystems and reduce biodiversity. Given the nature of the proposed clearing, it is unlikely to impact on- or off-site hydrology and water quality.</p>	At variance	Yes <i>Refer to Section 3.2.4, above.</i>
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils are highly susceptible to waterlogging, water repellence, subsurface acidification and nutrient export. Noting the location of the application area and the condition of the vegetation, the proposed clearing may have an impact on land degradation.</p>	May be at variance	Yes <i>Refer to Section 3.2.4, above.</i>
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>Given the application area is a manmade basin with water present at least part of the year, the proposed clearing may impact surface or ground water quality. All impacts are anticipated to be localised and temporary.</p>	May be at variance	Yes <i>Refer to Section 3.2.4, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (j)</u>: “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment</u></p> <p>The purpose of the clearing permit is to remove Typha and reduce the likelihood, incidence and intensity of flooding in the area.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.4, above.</i>

## Appendix E. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation’s ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

### Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as ‘parkland cleared’ with the flora comprising weed or crop species with isolated native trees or shrubs.

**Appendix E. Photographs of the vegetation**



Figure 1. Photos of application area

## Appendix F. Sources of information

### F.1. GIS databases

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://www.data.wa.gov.au)):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

### F.2. References

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