

City of Busselton
Geographe Bay

Council Agenda

13 April 2022

ALL INFORMATION AVAILABLE IN VARIOUS FORMATS ON REQUEST

city@busselton.wa.gov.au

CITY OF BUSSELTON

MEETING NOTICE AND AGENDA – 13 APRIL 2022


TO: THE MAYOR AND COUNCILLORS

NOTICE is given that a meeting of the Council will be held in the Council Chambers, Administration Building, Southern Drive, Busselton on Wednesday, 13 April 2022, commencing at 5.30pm.

Your attendance is respectfully requested.

DISCLAIMER

Statements or decisions made at Council meetings or briefings should not be relied on (or acted upon) by an applicant or any other person or entity until subsequent written notification has been given by or received from the City of Busselton. Without derogating from the generality of the above, approval of planning applications and building permits and acceptance of tenders and quotations will only become effective once written notice to that effect has been given to relevant parties. The City of Busselton expressly disclaims any liability for any loss arising from any person or body relying on any statement or decision made during a Council meeting or briefing.



MIKE ARCHER

CHIEF EXECUTIVE OFFICER

1 April 2022

CITY OF BUSSELTON

AGENDA FOR THE COUNCIL MEETING TO BE HELD ON 13 APRIL 2022

TABLE OF CONTENTS

ITEM NO.	SUBJECT	PAGE NO.
1.	DECLARATION OF OPENING, ACKNOWLEDGEMENT OF COUNTRY AND ANNOUNCEMENT OF VISITORS	4
2.	ATTENDANCE	4
3.	PRAYER	4
4.	APPLICATION FOR LEAVE OF ABSENCE.....	4
5.	DISCLOSURE OF INTERESTS	4
6.	ANNOUNCEMENTS WITHOUT DISCUSSION.....	4
7.	QUESTION TIME FOR PUBLIC.....	4
8.	CONFIRMATION AND RECEIPT OF MINUTES	4
	Previous Council Meetings	4
8.1	Minutes of the Council Meeting held 23 March 2022.....	4
9.	RECEIVING OF PETITIONS, PRESENTATIONS AND DEPUTATIONS	5
10.	QUESTIONS BY MEMBERS OF WHICH DUE NOTICE HAS BEEN GIVEN (WITHOUT DISCUSSION)	5
11.	ITEMS BROUGHT FORWARD FOR THE CONVENIENCE OF THOSE IN THE PUBLIC GALLERY.....	5
12.	REPORTS OF COMMITTEE	5
13.	PLANNING AND DEVELOPMENT SERVICES REPORT	6
13.1	APPLICATION FOR DEVELOPMENT APPROVAL (DA20/0437) - PROPOSED INDUSTRY - EXTRACTIVE (SAND) - 157 HAAG ROAD YELVERTON	6
13.2	AMENDMENT NO. 53 TO LOCAL PLANNING SCHEME NO. 21 (SCHEDULE 9 - EXEMPTED ADVERTISEMENTS) - CONSIDERATION FOR INITIATION FOR ADVERTISING	310
14.	ENGINEERING AND WORK SERVICES REPORT	317
15.	COMMUNITY AND COMMERCIAL SERVICES REPORT	318
15.1	MARKETING AND EVENTS REFERENCE GROUP OUTCOMES	318
16.	FINANCE AND CORPORATE SERVICES REPORT	329
17.	CHIEF EXECUTIVE OFFICERS REPORT	330
17.1	COUNCILLORS INFORMATION BULLETIN.....	330
18.	MOTIONS OF WHICH PREVIOUS NOTICE HAS BEEN GIVEN	341
19.	URGENT BUSINESS.....	341
20.	CONFIDENTIAL MATTERS	341
21.	CLOSURE	341

1. **DECLARATION OF OPENING, ACKNOWLEDGEMENT OF COUNTRY AND ANNOUNCEMENT OF VISITORS**

2. **ATTENDANCE**

Apologies

Approved Leave of Absence

Nil

3. **PRAYER**

4. **APPLICATION FOR LEAVE OF ABSENCE**

5. **DISCLOSURE OF INTERESTS**

6. **ANNOUNCEMENTS WITHOUT DISCUSSION**

Announcements by the Presiding Member

7. **QUESTION TIME FOR PUBLIC**

Response to Previous Questions Taken on Notice

Public Question Time For Public

8. **CONFIRMATION AND RECEIPT OF MINUTES**

Previous Council Meetings

8.1 **Minutes of the Council Meeting held 23 March 2022**

RECOMMENDATION

That the Minutes of the Council Meeting held 23 March 2022 be confirmed as a true and correct record.

9. RECEIVING OF PETITIONS, PRESENTATIONS AND DEPUTATIONS

Petitions

Presentations

Deputations

10. QUESTIONS BY MEMBERS OF WHICH DUE NOTICE HAS BEEN GIVEN (WITHOUT DISCUSSION)













11. ITEMS BROUGHT FORWARD FOR THE CONVENIENCE OF THOSE IN THE PUBLIC GALLERY

12. REPORTS OF COMMITTEE

Nil

13. PLANNING AND DEVELOPMENT SERVICES REPORT

13.1 APPLICATION FOR DEVELOPMENT APPROVAL (DA20/0437) - PROPOSED INDUSTRY - EXTRACTIVE (SAND) - 157 HAAG ROAD YELVERTON

STRATEGIC THEME	ENVIRONMENT - An environment that is valued, conserved and able to be enjoyed by current and future generations.
STRATEGIC PRIORITY	1.1 Ensure protection and enhancement of environmental values is a central consideration in land use planning
SUBJECT INDEX	Development /Planning Applications
BUSINESS UNIT	Statutory Planning
REPORTING OFFICER	Senior Development Planner – Policy - Stephanie Navarro
AUTHORISING OFFICER	Director, Planning and Development Services - Paul Needham
NATURE OF DECISION	Regulatory: To determine an application/matter that directly affects a person's right and interests e.g. development applications, applications for other permits/licences, and other decisions that may be reviewable by the State Administrative Tribunal
VOTING REQUIREMENT	Simple Majority
ATTACHMENTS	Attachment A Location Plan   Attachment B Site Aerial   Attachment C Proposed plans/documentation to be approved   Attachment D Additional explanatory reports and management plans   Attachment E Schedule of submissions – initial round   Attachment F Schedule of submissions - second round  

OFFICER RECOMMENDATION

That the Council determines:

- A. That application DA20/0437 submitted for 'Industry – Extractive' (sand) at Lot 75 (157), Haag Road, Yelverton is considered by the Council to be generally consistent with Local Planning Scheme No. 21 and the objectives of the zone within which it is located.
- B. That Development Approval is granted for the proposal referred to in (A) above subject to the following conditions –

GENERAL CONDITIONS

1. The development hereby approved is permitted to over a period of five years from the date of this Decision Notice. The site must be fully rehabilitated in accordance with the approved Closure and Rehabilitation Plan dated 1 October 2021 before the expiry date of this development approval.
2. The owner must ensure that the development hereby approved is undertaken in accordance with the approved plans, which are as follows, and any plans approved pursuant to other conditions of approval:
 - 2.1 Staging Plan with existing contours and maximum seasonal groundwater levels; and
 - 2.2 Concept Final Contour Plan; and
 - 2.3 Conservation Covenant Areas Plan dated 16 November 2021; and
 - 2.4 Operations Environment Management Plan dated 16 November 2021 (OEMP 2021); and
 - 2.5 Social Impact Assessment dated 16 November 2021 (SIS 2021); and
 - 2.6 Closure and Rehabilitation Plan dated 1 October 2021.

Where there is a conflict between a provision contained within a condition of this development approval and a provision contained within one of the plans listed above, the requirements of the condition shall prevail.

PRIOR TO COMMENCEMENT OF ANY DEVELOPMENT CONDITIONS:

- 3. The development hereby approved, or any works required to implement the development, shall not commence until the owner/applicant has applied for, and obtained, a Permit to Commence certificate from the City. The following plans/details are to be submitted to and approved by the City prior to requesting the issue of a Permit to Commence:**
 - 3.1 Details validating the water supply available for dust suppression to implement the approved dust management plan.**
 - 3.2 Details of the proposed crossover. The location / construction of the crossover shall be agreed to with the City and shall ensure that adequate sightlines are achieved.**
 - 3.3 Details of warning signage to be erected along the transport route. Signage shall include signs on both approaches to the pit along Haag Road 100 metres from the crossover.**
 - 3.4 Details of entry signage to be erected within the lot boundaries adjacent to the driveway and pit entrance visible to vehicles entering/exiting the Site. Signage shall include the following details:**
 - i. Approved operating hours; and**
 - ii. Site contact details; and**
 - iii. Ultra high frequency (UHF) channel for operators; and**
 - iv. Approved haulage route.**
 - 3.5 Means of ensuring adequate protection of conservation areas indicated on the approved Conservation Covenant Area Plan.**
 - 3.6 A 3D Digital Terrain Model prepared by a licensed surveyor for the whole of Lot 75 (157) Haag Road, Yelverton indicating the following in Australian Height Datum:**
 - (i) Existing ground levels;**
 - (ii) Proposed maximum extraction depths to maintain a minimum 500mm above maximum seasonal groundwater table ; and**
 - (iii) Minimum final ground levels after rehabilitation to maintain a minimum 700mm above maximum seasonal groundwater table.**
 - 3.7 A Clearing Permit for the removal of the vegetation from the Department of Water, Environment and Regulation.**
 - 3.8 The following being provided to the City:**
 - (i) A road maintenance bond of \$20,000 (being an unconditional bank guarantee) to ensure that the surrounding road network is maintained to the satisfaction of the City for the term of the approval. Those portions of public roads affected by the activities related to the approval shall be maintained to a standard acceptable to the City. The City may use the bond to maintain the affected public roads as it deems necessary.**
 - (ii) A dust bond to the value of \$5,000 (being an unconditional bank guarantee), which shall be held against satisfactory compliance with the Dust Management Plan.**
 - (iii) A rehabilitation bond to the value of \$30,000 (being an unconditional bank guarantee), which shall be held against satisfactory compliance with the Closure Plan.**

- (iv) Further to Conditions 3.8(i) – 3.8(iii) an executed legal agreement with the City (with the costs of preparation of that agreement being borne by the owner or nominee). The legal agreement shall provide for:
- (a) The ability for the City to be able to use the bonds, or parts of the bonds as appropriate, and any costs to the City including administrative costs of completing or rectifying any outstanding works in accordance with the conditions of this development approval and any further costs;
 - (b) Written authorisation from the owner of the land that the City may enter the site at any time and permit the City to complete or rectify any outstanding work to the satisfaction of the City;
 - (c) If at any time any part of the bond is called upon, used or applied by the City in accordance with the legal agreement, the restoration of the bond to the full amount required by these conditions; and
 - (d) The ability to lodge a caveat over the site to secure the City's interest.

ONGOING CONDITIONS:

4. The owner must ensure that the plans, details and works undertaken to satisfy Conditions 1, 2 and 3 are subsequently implemented and maintained for the life of the development and, in addition, the following conditions must be complied with:
- 4.1 The development hereby approved shall be limited to the excavation or movement of sand from its natural state on the site; screening of sand; transportation of sand within or off the site; construction of internal roads and rehabilitation works. At no time shall any blasting works be carried out.
 - 4.2 Operating hours, including in respect of any use of any vehicle or machinery or the transportation of materials, shall be restricted to the hours between:
 - a. 7.00am and 6.00pm Mondays to Fridays; and
 - b. 7.00am and 1.00pm Saturdays for rehabilitation works only.No works of any kind to be carried out at any time on Sundays or public holidays.
 - 4.3 The designated haulage route to Bussell Highway will be east along Haag Road and then south along Chambers Road. No other routes may be used until trucks have reached Bussell Highway.
 - 4.4 A maximum number of 24 truck movements (i.e. 12 trucks entering and 12 trucks exiting the site) shall be permitted on any operating day. No truck movements shall be permitted on any other day or outside the approved operating hours.
 - 4.5 Notwithstanding Conditions 4.3 and 4.4 above, should more than 20 truck movements per day and/or an alternative haulage route be proposed, a Traffic Management Plan is to first be both submitted to and approved in writing by the City; with the Plan being submitted to the City at least 7 working days prior to any haulage not consistent with Conditions 4.3 and 4.4 occurring.

Note: The City will not approve additional truck movements and/or an alternative haulage route for more than 20 working days in any calendar year. Any additional days will require a Modification to Development Approval to be submitted to, and approved by, the City.
 - 4.5 No more than 2 hectares shall be worked at any one time; this area shall then be rehabilitated in accordance with the approved details pursuant to Condition 2.1 concurrently with the extraction of the following 2 hectare area.

- 4.6 All operations related to the extractive industry shall be carried out in accordance with the approved OEMP 2021 and SIS 2021, including but not limited to:**
- i. part 3.1.4 – Quarantine - dieback and weeds of the OEMP; and**
 - ii. part 3.1.1 – Noise and Dust Management of the OEMP; and**
 - iii. on-going ground water monitoring in accordance with Table 8 : Hydrology and Pit Floor Management of the SIS 2021**
- 4.7 The approved Closure and Rehabilitation Plan shall be implemented and carried out in accordance with the approved details. Unless otherwise first agreed in writing, any trees or plants which, within a period of five years from first planting, are removed, die or, are assessed by the City as being seriously damaged, shall be replaced within the next available planting season with others of the same species, size and number as originally approved.**
- 4.8 The owner must ensure that, annually and within the month following every anniversary of the issue by the City of the Permit to Commence certificate, a 3D Digital Terrain Model is prepared by a licensed surveyor for the whole of Lot 75 (157) Haag Road, Yelverton indicating ground levels at the time of survey in Australian Height Datum.**
- 4.9 The owner must ensure that, annually and within three months following every anniversary of the issue by the City of the Permit to Commence certificate, a written report is given to the City that includes the following to the satisfaction of the City:**
- (a) A copy of the 3D Digital Terrain Model prepared in accordance with Condition 6.11 and a statement by a licensed surveyor certifying:**
 - (i) The extent/size and location of the area which has been extracted;**
 - (ii) The extent/size and location of the area which has been rehabilitated;**
 - (iii) The extent/size and location of the area which is currently under operation;****and**
 - (b) Details confirming that the conditions of this approval have been complied with and how the conditions have been complied with.**
- 4.10 No extraction operations, including the use of any vehicle or machinery or the stockpiling or transportation of extracted material, is to be undertaken on the site at any time when an annual written report is due under Condition 4.8 and has not been provided to the City.**
- 4.11 No development, including the use of any vehicle or machinery or the stockpiling or transportation of extracted material, may be carried out at any time when any bond that is required to be in force and effect under Condition 3.8 (or any agreement made in accordance with Condition 3.8) is not in full force and effect.**

EXECUTIVE SUMMARY

The City has received a development application for 'Industry – Extractive' (sand) at Lot 75 (157) Haag Road, Yelverton. Due to the nature of the issues requiring consideration and the level of community interest, the application is being presented to Council for determination, rather than being determined by City officers acting under delegated authority.

Having considered the application, including submissions received in relation to the application, City officers consider that the application is consistent with the *City of Busselton Local Planning Scheme No. 21* (Scheme) and the broader, relevant planning framework including Local Planning Policy 2.3 – Extractive Industries (LPP2.3).

It is recommended that the application is approved, subject to appropriate conditions.

BACKGROUND

In July 2020 the City received a development application for 'Industry – Extractive' (sand) at Lot 75 (157) Haag Road, Yelverton (the Site). One month prior to lodging the development application the City received notice from Department of Water and Environmental Regulations (DWER) that the applicant had lodge an application under section 51E(1) of the *Environmental Protection Act 1986* ('clearing permit') to clear 11.572 hectares of native vegetation on the Site for the purposes of sand extraction. The City received notice from DWER that additional information in relation to the clearing permit had been requested and that they were working with the applicant to resolve outstanding issues.

The application was subsequently accepted for assessment in September 2020 and was advertised to surrounding landowners within a 1 kilometre of the Site as well as several state government agencies. A submission was received from DWER that they were still processing the clearing permit and waiting on additional information from the applicant. The development application was subsequently placed on "hold" awaiting the outcome of the clearing permit assessment process.

In September 2021, the applicant obtained advice from DWER that they were satisfied with the revegetation plan and that a clearing permit would be granted, subject to conditions, including development approval from the City. Through the negotiation process with DWER the area approved to be cleared, and extracted, was reduced from 11.5 hectares to 5 hectares.

Following confirmation from DWER that a clearing permit could be obtained, the City re-commenced processing of the development application. Given the extent of change and passage of time, re-advertised the application to surrounding properties owners and occupiers within 1 kilometre of the Site.

Key information regarding the application is set out below —

1. **Landowner/s:** Staunton Developments Pty Ltd. (Note : The property has sold since the application was first lodged, the new owner has signed the development application form and the former owner has remained as the applicant for the application).
2. **Applicant:** Stuart Threadgold
3. **Site area:** 48.8643 Ha
4. **General description of site:** The Site is located approximately 1.1 kilometres west of the intersection of Haag Road and Chambers Road. The surrounding lots are predominately zoned Rural and are used for agricultural purposes, directly south-east and north-west of the Site there are two short term accommodation operators, Mile End Glamping and Hidden Valley Resort. In addition, there are two Bushland Protection zoned lots located to the north-east of the site, plus a reserve to the north-west of the Site.
5. **Current development/use:** The northern portion of the Site is currently used for agricultural pursuits and contains a dwelling and ancillary accommodation. The central portion of the site is the location of a previous sand extraction (DA ref : DA12/0338).
6. **Brief description of proposed development:** The applicant proposed to extract approximately 250,000 cubic metres of sand from an area of 5 hectares broken into three cells.

The applicant proposes to transport the materials to Bussell Highway by travelling east from the Site along Haag Road then turning south on to Chambers Road and travelling further east to Bussell Highway.

7. **Applicable Zoning and Special Control Area designations:** The site is located within the Rural Zone.
8. **Land-use permissibility:** Industry – Extractive is an ‘A’ use in the Rural Zone, meaning that it is a use that may be permitted in the Zone at the reasonable discretion of the City, following a compulsory period of consultation and consideration of any submissions received. Under LPP2.3 the site is located within Policy Area 3, which is considered less constrained than other policy areas due to the primarily agriculture nature of the area.

The following attachments are provided –

- Attachment A – Location plan.
- Attachment B – Site aerial.
- Attachment C – Proposed plans/documents to be approved, including;
 - Staging Plan with existing contours and maximum seasonal groundwater levels; and
 - Concept final contour plan; and
 - Conservation covenant areas dated 16 November 2021; and
 - Operations Environment Management Plan dated 16 November 2021; and
 - Social Impact Assessment dated 16 November 2021; and
 - Closure and Rehabilitation Plan dated 1 October 2021.
- Attachment D – Addition explanatory reports and management plans, including;
 - Fauna Assessment; and
 - Flora and Vegetation Assessment; and
 - Hydrological Assessment.
- Attachment E – Schedule of submissions – initial round.
- Attachment F – Schedule of submissions – second round.

OFFICER COMMENT

Provided below is an outline of some of the key considerations, that the proposal clearly complies with -

- Lot boundary setbacks - The proposal meets the requirement related to minimum setbacks from property boundaries (i.e. 20 metres).
- Separation to the maximum seasonal ground water table - Hydrological information has been provided setting out that the pit levels as well as the final surface levels following rehabilitation will meet the requirements of DWER’s Water Quality Protection Note 15 Basic Raw Materials Extraction (2019).
- School bus route - There are no school bus routes along either Haag Road or Chambers Road which form part of the haulage route to Bussell Highway.
- Rehabilitation – Sufficient separation distance from final ground level to the maximum seasonal ground water table of 700mm can be achieved and will be enforced via an on-going condition of development approval.

- Phytophthora dieback (dieback) & weed management – Inconsistent advice has been provided by the applicant and DBCA regarding the presence of dieback on the Site, however, flora surveys have indicated that two declared pest species under the *Biosecurity and Agriculture Management Act (2007)* are present on the Site being *Asparagus asparagoides* (bridal creeper) and *Zantedeschia aethiopica* (Arum lily). Both a dieback and weed management plan have been submitted as part of the development application and form part of the supporting documentation. Both plans are to be implemented via a condition of development approval.

The following considerations, all of which were raised through submissions, are also relevant, and require further discussion –

1. Site History; and
2. Environmental impacts; and
3. Amenity Impacts, including setbacks to sensitive premises; and
4. Haulage.

Each of these issues is outlined and discussed below, under appropriate sub-headings.

Site History

The current applicant, and former owner of the Site, initially gained approval to operate an extractive from the Site in September 2005. This approval proposed to extract 240,000m³ of sand from the northern portion of the Site and proposed access to the Site from Chambers Road via an adjoining lot. This application was never implemented and subsequently expired.

The applicant re-applied in 2012 for the same area to be extracted as the 2005 approval, however, access was proposed to be taken from Haag Road rather than via the adjoining lot onto Chambers Road. The Council, at its meeting held on 24 April 2013, granted approval to this proposal subject to several conditions including a condition that Haag Road, which was a single width gravel road, be sealed at the applicant's expense. The applicant subsequently appealed this condition through the State Administrative Tribunal (SAT) and through the mediation process the condition was amended such that Haag Road was no longer required to be sealed, however, it was required to be upgraded to a 7 metre wide gravel constructed formation.

In 2017, the applicant lodged a development application for sand extraction which proposed to extract material in the same location as what was initially proposed as part of the current application before the Council. This application was refused by the City under Delegated Authority on 6 April 2018 for the following reasons:

REFUSE TO GRANT DEVELOPMENT APPROVAL

for the following reasons:

1. *The site is located within the Geographe Bay Rivers Surface Water Area and the Busselton-Capel Groundwater Area, both proclaimed under the 'Rights in Water and Irrigation Act 1914. On the basis of the lack of information, it is considered the proposal would intercept groundwater to the detriment of the natural environment and water resources.*
2. *On the basis of the lack of information submitted the impact on the site's hydrology is considered to pose an unacceptable risk to groundwater dependent Federally listed vegetation community, 'Banksia Woodlands of the Swan Coastal Plain'. Further, changes in hydrological function would impact on the vegetation community.*

3. *The proposal would result in the loss of Federally listed vegetation community, 'Banksia Woodlands of the Swan Coastal Plain', the vegetation provides habitat for the Western Ringtail Possum. It is considered that the loss of the vegetation would result in an unacceptable impact on the natural environment.*
4. *Insufficient information has been submitted to confirm that the vegetation is subject to dieback. Notwithstanding Reason No.3 above, on the basis of the lack of information, the proposal may result in the spread of Dieback to the detriment of the environment and surrounding properties.*
5. *On the basis of the lack of information, the post extraction change in ground level will result in standing groundwater, exposure of groundwater to pollutants, evaporative loss of the resource and hydrological dysfunction. Changes in hydrology will severely impact the agricultural viability of the site following extractive activities.*
6. *Clause 67 of the Planning and Development (Local Planning Schemes) Regulations 2015 Deemed Provisions lists matters that local government is to have due regard to when considering a development application. The following are considered to be of relevance to the subject proposal:*
 - (a) *The aims and provisions of the Scheme and any other local planning Scheme operating within the Scheme Area;*
 - (g) *Any local planning policy for the Scheme area;*
 - (n) *The amenity of the locality including the following –*
 - i) *Environmental impacts of the development*
 - (o) *The likely effect of the development on the natural environment or water resources and any means that are proposed to protect or to mitigate impacts on the natural environment or the water resource;*
 - (p) *Whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;*
 - (q) *The suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bush fire, soil erosion, land degradation or any other risk;*
 - (za) *comments or submissions received from any authority consulted under clause 66;*

Approval of the proposal would be in conflict with provisions (a), (g), (n), (o), (p), (q) and (za) listed under Clause 67 of the Regulations.

7. *As a result of the above the proposal is inconsistent with Local Planning Scheme 21 Clause 3.2.6 objectives of the Agriculture zone:*
 - (a) *To conserve the productive potential of rural land*
 - (k) *To control the clearing of trees and encourage generally the retention of vegetation and vegetation corridors concomitant with the agricultural use of the land.*
8. *Further, the proposal is inconsistent with the below considerations of Local Planning Policy 5A: Extractive Industry Provisions:*
 - (1) *Proximity to areas of declared rare or endangered flora and fauna (DRF) or threatened ecological communities.*
 - (2) *Proximity to and significance of watercourses, drains, wetlands and on-site and adjoining dams and need for surface drainage and groundwater management plans.*
 - (3) *Evidence of Dieback disease and the suitability of a Dieback Hygiene Management Plan.*
 - (4) *Comments or recommendations from the Environmental Protection Authority, Department of Agriculture and Food WA, the Department of Water or any other relevant government agency.*
 - (5) *Proposed end use of the site, particularly if intending to revert to agricultural land*
9. *Approval of this development would be inconsistent with the orderly and proper planning of the locality for the reasons noted above.*

The applicant subsequently appealed this refusal through the SAT, however, following mediation between the City and the applicant, the applicant withdrew from the SAT proceedings.

The applicant lodged another development application for the same proposed extraction location in September 2019, however, this application was not accepted by the City as the information in relation to groundwater monitoring was deemed insufficient to constitute 'an application' for the purposes of the Regulations. The applicant had previously been advised that details of the Maximum Seasonal Groundwater Level was required to be submitted as part of the development application and that this information should comprise of water monitoring details which should be correlated to historical data from the most appropriate DWER regional monitoring bore, groundwater contour map and proposed maximum pit floor levels.

The applicant subsequently undertook the required water monitoring and submitted the current development application with the City in July 2020, while working with DWER to resolve outstanding issues with the clearing permit. In September 2021, the applicant obtained advice from DWER that they were satisfied with the revegetation plan and that a clearing permit would be granted, subject to conditions, including development approval from the City. Through the negotiation process with DWER the area approved to be cleared, and extracted, was reduced from 11.5 hectares to 5 hectares.

Following confirmation from DWER that a clearing permit could be obtained, the City re-commenced processing of the development application. Given the extent of change and passage of time, the City re-advertised the application over December 2021 – January 2022 to surrounding properties owners and occupiers within 1 kilometre of the Site.

It is noted that through the time taken to process the development application, the property has sold and is now under new ownership. The new owner has signed the development application form and the previous owner has remained the applicant for the application. It is not uncommon for owners to nominate another party to act as the applicant for a development application and, as development approval runs with the land and not the owner, it is considered that there are no on-going implications from a planning point of view as a result of the change in ownership.

Environmental Impacts

The portion of site subject to this application will require the removal of native vegetation and a clearing permit from DWER. Whilst the City needs to consider potential environmental impacts in the assessment of development applications, it is not appropriate that the City duplicate State and/or Commonwealth regulatory processes. DWER have indicated that a conditional clearing permit could be obtained for the proposed area to be cleared, subject to conditions requiring rehabilitation to be undertaken, it is considered that the environmental impacts, including impacts on both fauna and flora, of the development have been sufficiently assessed and addressed.

In light of the clearing permit not being issued, a condition has been recommended that prior to commencement a clearing permit is required to be submitted to the City. Whilst imposing a condition that requires a licence to be issued under the *Environmental Protection Act 1986* could be challenged in the SAT, it is considered that it is appropriate as the applicant could withdraw the clearing permit that is being assessed and the environmental impacts would not have been considered as part of this application.

Amenity Impacts, including setbacks to sensitive premises

A number of concerns have been raised in relation to the potential impact of the proposal on the “residential amenity” of the area. It is noted that the site is zoned ‘Rural’ and is surrounded by ‘Rural’ zoned properties.

In *AGC Earthmoving Group Pty Ltd and Shire of Mundaring* [2008] WASAT 151, the SAT dealt with the ‘central question’ of rural amenity, and the position of the rural residents who objected to an extractive industry on this basis. The SAT decision stated as follows:

Even allowing for the fact that rural areas are not immune from noise and related issues (“Rural areas generate a variety of “externalities” mainly noise and dust emissions. One cannot expect to reside in such a zone and necessarily expect a quiet and serene rural environment.” : Marley Duncan v Corporation of the Town of Gawler [2003] SAERDC 28 ... cited in Self and Shire of Serpentine Jarrahdale [2005] WASAT 140 ... the objectors [in AGC] still remain troubled that their ‘idyllic’ lifestyle might be affected by an activity (here an extractive industry) which they see as wholly counter to the notions of rural living, especially in an area such as here where the subject land forms a ‘quiet rural cul-de-sac’. However, it is well settled that the noise and other nuisances that may be expected from the class of potential activities permitted or contemplated (if approved) in rural areas produces no absolutes in favour of objecting residents...

It is therefore considered that due to the zoning of the property, and surrounding area, that a different level of consideration to “amenity” should be given to that of an area zoned ‘Residential’.

While it is noted that there are sensitive premises located on surrounding lots, the zone in which they are located is one set aside for rural activities often, if not always, associated with a degree of impact.

The main emissions generated from an extractive operation that have the potential to have a detrimental impact upon the amenity of surrounding properties are noise and dust. In line with the requirements of the *Environmental Protection Act 1986*, it is necessary for individual operators to take all reasonable and practicable measures to prevent or minimise emissions from their premise.

It is generally expected that, through appropriate site layout and design as well the implementation of adequate management plans, emissions from an individual extractive operation can be prevented from causing an adverse impact beyond the boundaries of the particular site. Generally, impacts will decrease with increasing distance from the source of the emission and therefore buffer distances are applied.

The Environmental Protection Authority Guidance Statement No.3 (EPA Guidance Statement) provides advice on generic separation distances between specific industries and sensitive land uses to avoid or minimise the potential for land use conflict. The distances outlined in the EPA Guidance Statement are not intended to be absolute separation distances, rather they are a default distance for the purposes of:

- identifying the need for specific separation distance or buffer definition studies; and
- providing general guidance on separation distances in the absence of site specific technical studies.

Where a lesser setback is proposed than that identified within the EPA Guidance Statement, it is not adequate justification for an application to not be supported, but rather that site-specific investigations are to be undertaken and reports demonstrating that the separation distance will meet acceptability criteria be submitted. Furthermore, enforceable management techniques should be applied to ensure an appropriate outcome.

In relation to separation distances, the EPA Guidance Statement provides the following generic buffer distances for sand extraction is 300m – 500m (depending on scale). The City's LPP2.3 states as follows in relation to setback distances:

Notwithstanding 6.2.1 and 6.2.2 above, the extraction of sand and limestone may be located less than 500m but generally no closer than 300m from a sensitive land use dependent upon the nature and scale of the operation and the content of a Dust and Noise Management Plan including consideration of the requirement for dust and noise measuring equipment to be installed within the site for the duration of the extraction process. However this will not apply to the extraction of basalt and other hard rock quarrying which requires greater setback distances (generally a minimum of 1000m) to a sensitive land use.

In relation to this development application, with the exception of Lot 22 (76) Yelverton Road all of the surrounding sensitive land uses, including dwellings, would be in excess of 500m to the proposed extraction area. In relation to Lot 22 (76), the property contains a dwelling setback at approximately 350m and two chalets, one of which setback at approximately 485m to the proposed extraction area. All of the sensitive premises on Lot 22 (76) would have a separation distance in excess of the minimum separation distance of 300m.

The two main potential impacts are noise and dust. The City has not previously received any complaints regarding operations on the Site in relation to dust, however, it has received complaints regarding noise from beepers on machinery working within the pit. It is noted that there is dense, mature vegetation between the proposed extractive area and these sensitive premises that will assist in ameliorating any impacts.

As further controls, the operations will be required to comply with the *Environmental Protection (Noise) Regulations 1997* and dust will be required to be contained on site via the requirements of the Dust Management Plan and *Dust and Building Waste Local Law* it is considered that these external impacts will be adequately addressed and therefore the proposed setbacks are appropriate.

The EPA Guidance Statement and LPP2.3 do not address separation distances of a sensitive premises from a proposed haulage route. This matter, in particular in relation to dust, has been addressed further under the Haulage heading below.

Haulage

Dust from using a gravel road

In the last 5–10 years, the City has approved several extractive operations which proposed to use gravel roads as part of their haulage route. The most recent being an extraction at Lot 101 (285) Gibb Road (City Ref: DA18/0674).

In this instance, the following 3 dwellings along the gravel portion of the haulage route along Haag Road. These dwellings and their setbacks to the gravel formation of Haag Road are as follows:

- Lot 102 (84) Haag Road setback 280m;
- Lot 2 (82) Haag Road setback 340m; and
- Lot 7 (2) Haag Road setback 350m.

With regard to the concerns raised about dust generated from the haul route, the City's *Dust and Building Waste Control Local Law* (Local Law) and LPP2.3 only deals with dust from a site and requires dust from a vehicle load (i.e. the sand in the tray of a truck) be contained via "effective measures". The Local Law and LPP2.3 do not deal with dust generated from the road surface by a vehicle travelling along a road. As a result the dust management plan recommends dust suppression within the site and internal haul routes only.

Suitability of haulage route

The applicant has indicated that a maximum of 24 truck movements per day (12 trucks entering, 12 trucks leaving the property) are proposed. It is noted that the previous extraction approved on the Site in 2005 proposed to remove a similar amount as the current application (240,000m³) over a shorter timeframe (3 years). This supporting documentation submitted as part of this application indicated that 24 truck movements per day (12 trucks entering, 12 trucks leaving the property).

Traffic data collected by the City along Haag Road in 2018 indicates a maximum daily vehicle count of 45 movements per day. It is noted that no new, traffic generating development has been approved along Haag Road since 2018 and therefore it is considered that this data accurately reflects traffic movements along Haag Road.

Under the City's LPP2.3 it is noted that daily movements over 75 per day it is recommended that roads be upgraded to a minimum carriageway width of 7.5 metres with a 3.5 metre seal. The City has previously obtained advice from a traffic consultant regarding the requirements of road upgrades, due to the age of the LPP it is outdated and has not kept up with current standards, including Austroad Guidelines.

The Austroad Guidelines detail standards for the design of sealed roads in Western Australia. As Austroad does not deal with unsealed roads, Main Roads advise that for guidance on the design of unsealed roads, reference is made to the "ARRB Unsealed roads manual Guidelines to good practice 3rd edition March 2009-08-19" (ARRB Guidelines). Under the ARRB Guidelines, the carriageway requirements for roads with 'very low volumes' (less than 150vpd) is one lane with a carriageway width (including shoulders) of 5m–6m.

This standard allows for vehicle to pass each other by riding half on the traffic land and half on the shoulders. ARRB Guidelines state that roads carrying 'heavy or long vehicles towing multiple trailers' (i.e. any vehicle greater in length or weight than an 'as-of-right' vehicle) should require additional road width in the order of 200mm per lane. It is considered that by requiring the carriageway width to be widened to 7 metres, adequate lane width is provided for two semi-trailers to pass. Taking into account the proposed maximum vehicle movements per day, it is considered that the likelihood of this occurring is relatively low, however, if this does occur it can be accommodated in the wider carriageway width.

Haag Road was upgraded to a 7m wide constructed gravel formation as required by a condition of the 2012 approval, and no greater number of truck movements are proposed as part of this application. There is not considered to be any planning basis on which to either refuse the application on traffic grounds, or require further upgrades.

Statutory Environment

The key statutory environment is set out in the *City of Busselton Local Planning Scheme 21* (Scheme), the *Planning and Development (Local Planning Schemes) Regulations 2015* (Regulations), Schedule 2 of which is the 'deemed provisions', which also functionally form part of the Scheme. Key aspects of the Scheme and Regulations relevant to consideration of the application are set out below.

Zoning

The site is zoned 'Rural'. The objectives of the 'Rural' zone are as follows –

- a. *To provide for the maintenance or enhancement of specific local rural character.*
- b. *To protect broad acre agricultural activities such as cropping and grazing and intensive uses such as viticulture and horticulture as primary uses, with other rural activities as secondary uses in circumstances where they demonstrate compatibility with the primary use.*
- c. *To maintain and enhance the environmental qualities of the landscape, vegetation, soils and waterways, to protect sensitive areas especially the natural valley and watercourse systems from damage.*
- d. *To provide for the operation and development of existing, future and potential rural land uses by limiting the introduction of sensitive land uses.*
- e. *To provide for a range of non-rural land uses where they have demonstrated benefit and are compatible with surrounding rural uses.*
- f. *To provide for development and expansion of the viticultural, winemaking and associated tourism activities and other industries related to agricultural activities, in addition to general rural pursuits, in a manner that does not cause adverse environmental impact.*
- g. *To provide for the extraction of basic raw materials, where appropriate.*

The proposal is considered to satisfy the objectives of the zone.

Matters to be considered

Clause 67 of the deemed provisions within the Regulations sets out 'considerations of applications by local government' and outlines the matters to be given due regard by a local government in considering an application for development approval. The following matters are considered to be relevant to consideration of this application –

- (2) *In considering an application for development approval (other than an application on which approval cannot be granted under subclause (1)), In considering an application for development approval the local government is to have due regard to the following matters to the extent that, in the opinion of the local government, those matters are relevant to the development the subject of the application –*
- (a) *the aims and provisions of this Scheme and any other local planning scheme operating within the Scheme area;*
 - b) *the requirements of orderly and proper planning including any proposed local planning scheme or amendment to this Scheme that has been advertised under the Planning and Development (Local Planning Schemes) Regulations 2015 or any other proposed planning instrument that the local government is seriously considering adopting or approving;*
 - (c) *any approved State planning policy;*
 - (d) *any environmental protection policy approved under the Environmental Protection Act 1986 section 31(d);*
 - ...
 - (g) *any local planning policy for the Scheme area;*
 - ...
 - (m) *the compatibility of the development with its setting including –*
 - (i) *the compatibility of the development with the desired future character of its setting; and*
 - (ii) *the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;*
 - (n) *the amenity of the locality including the following –*
 - (i) *environmental impacts of the development;*
 - (ii) *the character of the locality;*
 - (iii) *social impacts of the development;*
 - (o) *the likely effect of the development on the natural environment or water resources and any means that are proposed to protect or to mitigate impacts on the natural environment or the water resource;*
 - (p) *whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;*
 - (q) *the suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bush fire, soil erosion, land degradation or any other risk;*
 - (s) *the adequacy of –*
 - (i) *the proposed means of access to and egress from the site; and*
 - (ii) *arrangements for the loading, unloading, manoeuvring and parking of vehicles;*

- (t) *the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;*
- (x) *the impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals;*
- (y) *any submissions received on the application;*
- (za) *the comments or submissions received from any authority consulted under clause 66;*
- (zb) *any other planning consideration the local government considers appropriate.*

Relevant Plans and Policies

Leeuwin-Naturaliste Ridge Statement of Planning Policy

The LNRSP places a very high priority on the protection of Prime Agricultural Land with the overriding criterion being to ensure the predominant use of land will be agriculture. Other uses, including uses of interspersed lands with lesser agricultural potential, will be compatible with and not jeopardise, agricultural use of adjoining Prime Agricultural Land. The LNRSP requires that development of mineral and basic raw material resources will be subject to programmed rehabilitation which will be recommended as a condition of any Planning Consent (Development Application) granted. The rehabilitation of the extracted area with native vegetation is required as a condition of development approval and the clearing permit from DWER when granted.

State Planning Policy 2.4 - Basic raw materials

The intent of SPP2.4 is to ensure basic raw materials (BRM) and extractive industries matters are considered during planning and development decision-making, to facilitate the responsible extraction and use of the State's BRM resources. The objectives of SPP2.4 are to:

- ensure BRM and its regional importance is considered at the earliest stages of the planning process;
- protect BRM in SGS areas and ES by avoiding encroachment from incompatible land uses;
- ensure BRM resources are used efficiently in land use planning and development;
- identify BRM extraction opportunities through sequential land use without compromising the final intended land use; and
- ensure the extraction of BRM avoids, minimises or mitigates any adverse impacts on the community, water resources and biodiversity values.

Local Planning Policy 2.3 - Extractive Industries

Local planning policies must be given due regard, but cannot and do not bind the City, in the assessment of applications for development approval. LPP2.3 provides guidance regarding the extraction of basic raw materials. The application site is located within Policy Area 3, elements of LPP2.3 considered particularly relevant to assessment of the application are as follows –

- 4.2.2.3 *Policy Areas 2 and 3: Notwithstanding 6.2.1 and 6.2.2 above, the extraction of sand and limestone may be located less than 500m but generally no closer than 300m from a sensitive land use dependent upon the nature and scale of the operation and the content of a Dust and Noise Management plan including consideration of the requirement for dust and noise measuring equipment to be installed within the site for the duration of the extraction process. However this will not apply to the extraction of basalt and other hard rock quarrying which requires greater setback distances (generally a minimum of 1000m) to a sensitive land use.*

4.2.2.5 *Policy Areas 2 and 3: Where an extractive industry is approved within 1km of a residence or tourist accommodation or attraction, additional conditions to reduce amenity impact from noise and dust may be imposed, including operating times.*

4.2.5 *Route Assessment and Transportation:*

The potential impacts of an extractive industry will be assessed against the Scheme and the following criteria:

- a) The outcomes of the Schedule 1 – Traffic Impact Assessment and Road Upgrading Guidelines.*
- b) Any comments or recommendations from Main Roads WA.*
- c) The impacts of haulage traffic noise, vibration and amenity loss on surrounding areas.*

Financial Implications

There are no financial implications associated with the officer recommendation.

Stakeholder Consultation

The application was initially advertised in accordance with clause 64 Advertising applications of the *Planning and Development (Local Planning Scheme) Regulations 2015 (Regulations)*. Clause 64 of the deemed provisions sets out circumstances in which an application for development approval must be advertised, and also sets out the means by which applications may be advertised.

The purpose of public consultation is to provide an opportunity for issues associated with a proposed development to be identified by those who potentially may be affected. A development application should not be approved or refused based on the number of submissions it receives, for or against, rather all applications must be determined on the merits of the particular proposal, including consideration of any relevant planning issues raised through consultation.

The application was initially open for submissions from 24 September 2020 to 21 October 2020. The application was advertised in the following manner –

1. Information regarding the application was posted on the City's website;
2. A portal was created using the City's *YourSay* platform for the online lodgement of submissions;
3. Letters were sent to all the land owners within one kilometre of the site; and
4. A notice was placed in a local newspaper on 30 September 2020.

A total of 10 submission were received all of which opposed the development. A summary of submissions received during the initial round of advertising is provided at Attachment E.

Once confirmation from DWER that a clearing permit could be obtained, due to the length of time that had passed since the application was originally advertised, the City deemed it necessary for the application to be readvertised. In addition, in the time that the application was originally advertised four properties within 1km of the site changed ownership. In addition, in 2021 updates to the Regulations came into effect and the application as now required to be assessed as a "complex" application Under the Regulations, all complex applications are required to be advertised for a minimum consultation period of 28 days (previously 14 or 21 days) via the following means:

1. Notice/letters sent to all owners and occupiers within 200m of the site (note: the City's LPP Extractive Industry requires consultation within 1km of the site);
2. Sign/s on site; and
3. Notice placed within the newspaper.

The application was subsequently re-advertised from 3 December 2021 to 7 January 2022. The application was advertised in the following manner –

1. Information regarding the application was posted on the City's website;
2. A portal was created using the City's *YourSay* platform for the online lodgement of submissions;
3. Letters were sent to all the land owners and occupiers within one kilometre of the site; and
4. A notice was placed in a local newspaper on 10, 17, 24 and 31 December 2020.

A total of 13 submissions were received all of which opposed the development. A summary of submissions received during the initial round of advertising is provided at Attachment F.

The key concerns raised in both rounds of advertising are as outline below:

- Concerns regarding haulage route including safety; and
- Concerns regarding environmental impacts including clearing of native vegetation; and
- Concerns regarding dust and noise; and
- Concerns regarding on-going compliance; and
- Concerns regarding proximity to sensitive land uses.

These concerns are address further in the officer comment section of this report above.

Risk Assessment

An assessment of the potential implications of implementing the officer recommendation has been undertaken using the City's risk management framework, with risks assessed taking into account any controls already in place. The key risk to the City is considered to be the potential reputational and environmental risk that may arise if the site is not managed in a manner consistent with the conditions of approval. Mitigation of that risk requires proactive and appropriately resourced compliance activity.

Options

As an alternative to the proposed recommendation the Council could:

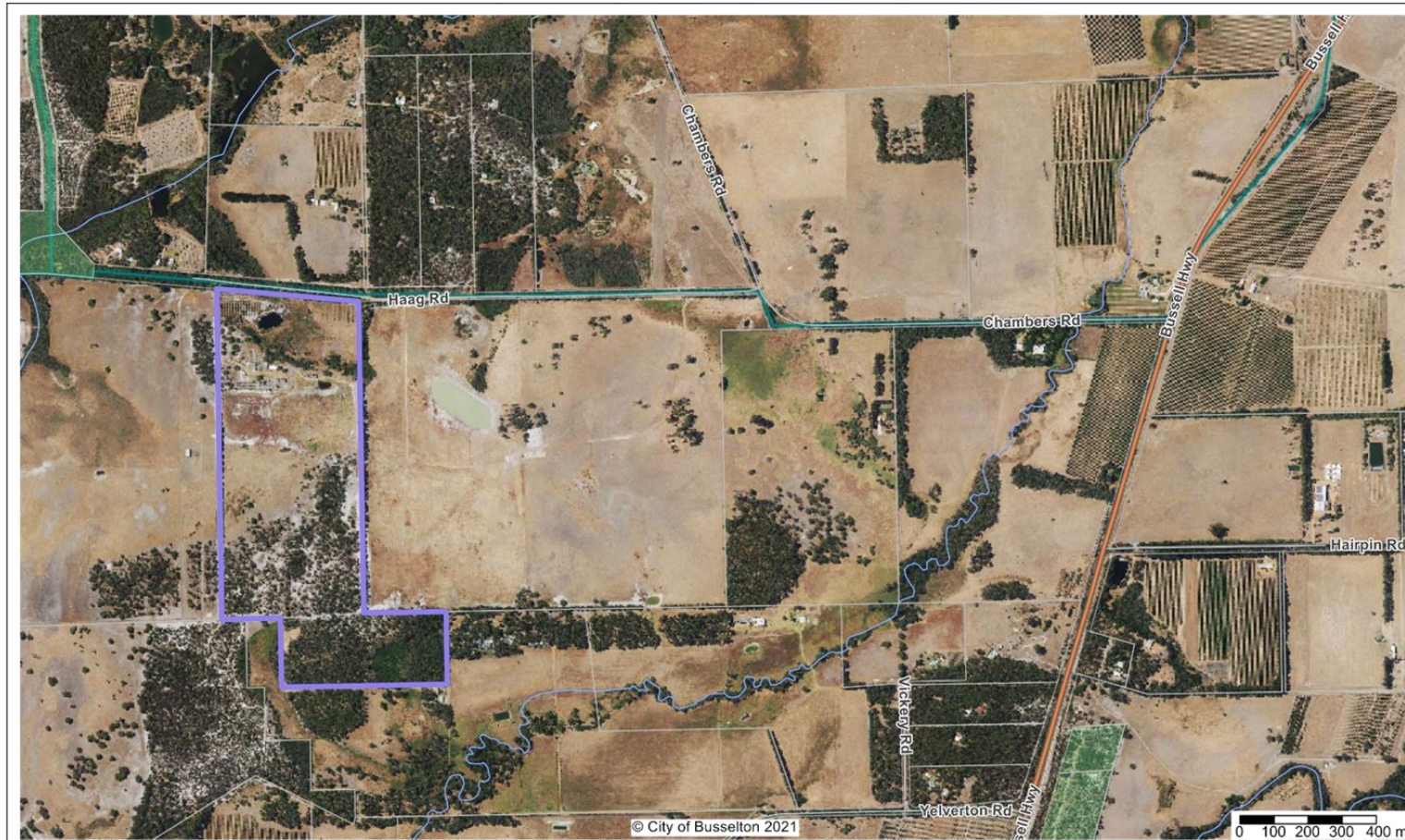
1. Refuse the proposal, setting out reasons for doing so; or
2. Apply additional or different conditions.

CONCLUSION

Subject to the inclusion of relevant conditions, the proposal is considered appropriate to support and it is accordingly recommended for approval

TIMELINE FOR IMPLEMENTATION OF OFFICER RECOMMENDATION

The applicant and those who made a submission will be advised of the Council decision within two weeks of the Council meeting.



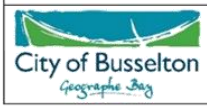
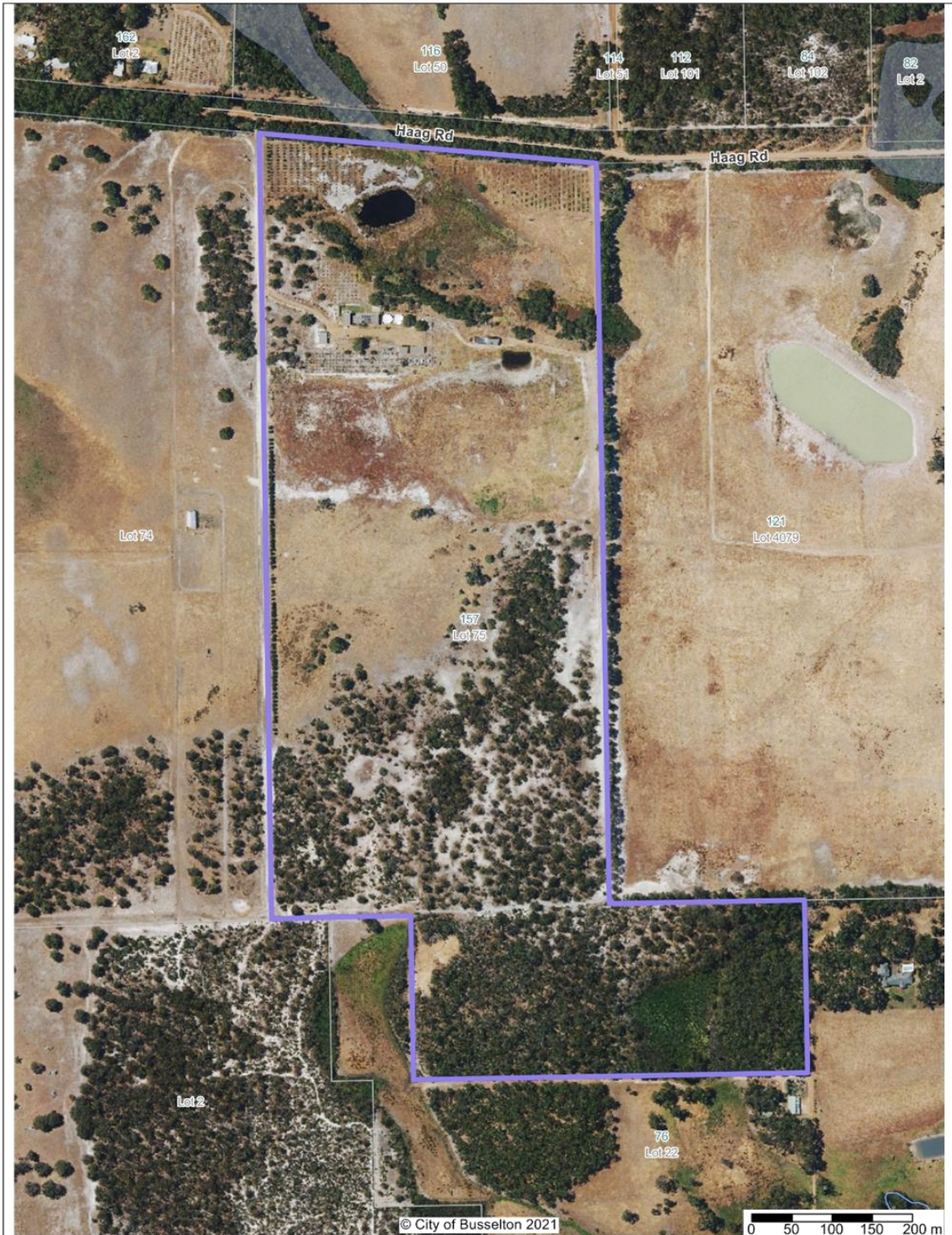
Disclaimer: Every effort has been made to make the information displayed here as accurate as possible. This process is ongoing and the information is therefore ever changing and cannot be disseminated as accurate. Care must be taken not to use this information as correct or legally binding. To verify information contact the City of Busselton office.

Location Plan

16/03/2022

1:15000 @ A4L



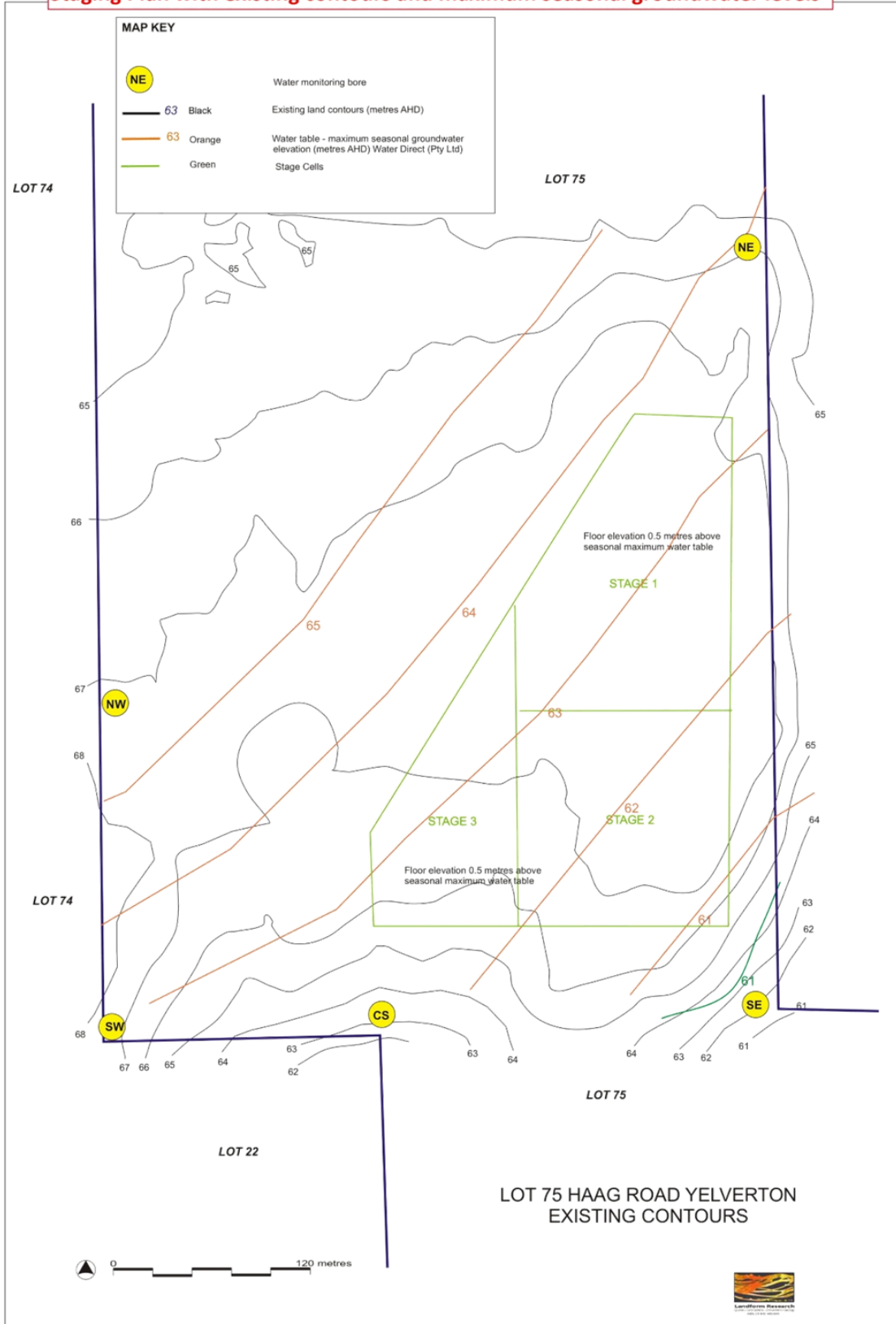


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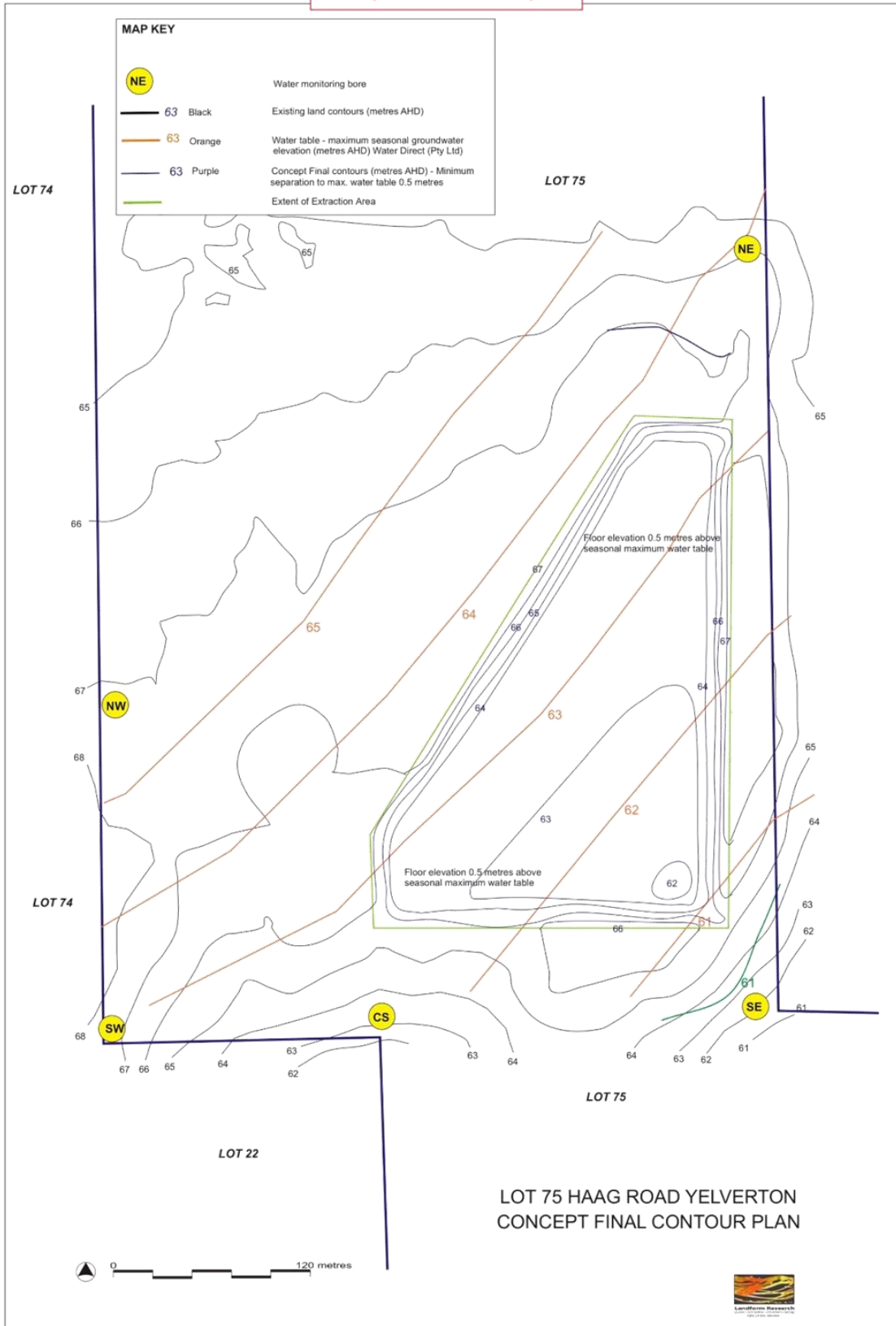
16/03/2022
1:6000 @ A4P



Staging Plan with existing contours and maximum seasonal groundwater levels



Concept final contour plan



Conservation covenant areas

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

5.1.5 Closure and Rehabilitation Strategy

The Closure and revegetation is covered by the Closure and Rehabilitation Plan for Clearing Permit CPS 8863/1. The Closure and rehabilitation Plan has been approved by DWER.

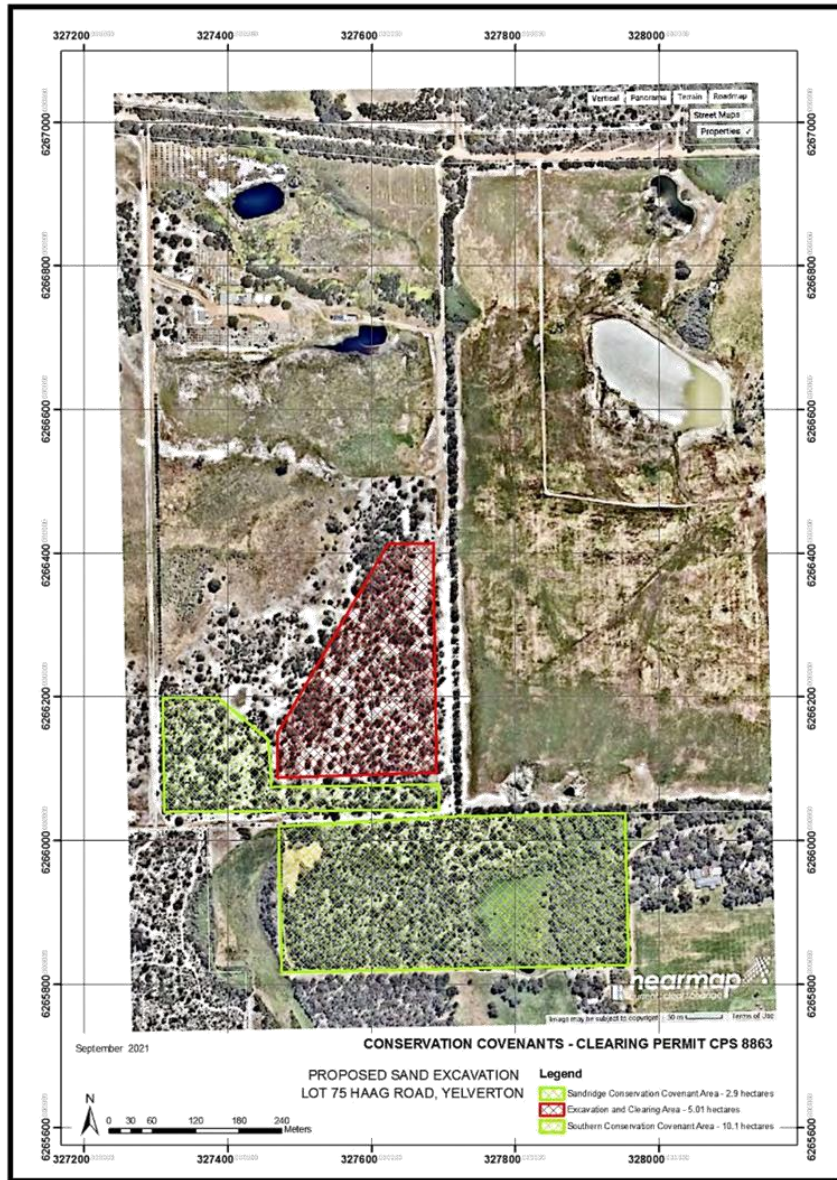


Figure 12: Closure and conservation areas

Operations Environment Management Plan

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

OPERATIONS ENVIRONMENT MANAGEMENT PLAN
(SAND EXTRACTION)

LOT 785 HAAG ROAD, YELVERTON



Version 2 Update 16 October 2021

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

CONTENTS

1.0	INTRODUCTION	5
1.1	Purpose of the Operations Environmental Management Plan (OEMP)	5
1.2	Scope of the Operations Environmental Management Plan	5
2.0	SUMMARY PROJECTION DESCRIPTION	6
2.1	Site Layout, Facilities and Traffic Management	6
2.2	Project Staging	6
2.2.1	Vegetation Removal (where required)	6
2.2.2	Topsoil Removal	7
2.2.3	Sand Extraction	7
2.2.4	Volume of Sand	7
2.2.5	Pit Form	7
2.2.6	Equipment	7
3.0	ENVIRONMENTAL MANAGEMENT RESPONSIBILITIES	9
3.1	Environmental Management During Operations	9
3.1.1	Noise and Dust Management	9
3.1.2	Road Monitoring	9
3.1.3	Site Drainage, Water Quality Control	10
3.1.4	Quarantine – Dieback and Weeds	11
3.1.5	Flora and Fauna, Site Buffering and Rehabilitation	12
4.0	IMPLEMENTATION	13
4.1	Organisational Structure, Roles and Responsibilities	13
4.2	Contractual Controls	13
4.3	Environmental Monitoring and Incident Records	14
4.4	Reports	14
4.5	Documentation	14
4.6	Management of Complaints	14
4.7	Training	15
4.8	Review	15
5.0	COMMITMENTS REGISTER	16

TABLES

Table 1: Noise and dust management responsibilities	9
Table 2: Transport management responsibilities	10
Table 3: Water management responsibilities	10
Table 4: Dieback and weed management responsibilities	11
Table 5: Flora and vegetation management responsibilities	12
Table 6: On siteroles and responsibilities	13

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

Table 7: Contractual arrangements	13
Table 8: Monitoring requirements	14
Table 9: Reporting requirements.....	14
Table 10: Commitments register	16

ATTACHMENTS - DOCUMENTATION

- Harewood G, 2019, *Targeted Fauna Assessment, Lot 75 Haag Road Yelverton.*
- Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. *Lot 75 Haag Road, Yelverton.*
- Survey South 2020, *Feature Survey and Contour Plan of Lot 75 Haag Road Yelverton.*
- Threadgold Architecture, 2021, *Development Application (Sand Extraction) – Social Impact Assessment, Lot 75 Haag Road.*
- Threadgold Architecture, 2021, *Operations Environmental Management Plan – Sand Extraction, Yelverton.*
- Water Direct Pty Ltd, August 2020 V2, Hydrogeological Assessment Extractive Industries Approval, for S and C Threadgold, 157 Haag Road Yelverton.
- Landform Research 2021, Proposed Sand Excavation, Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton.

ABBREVIATIONS

AHD	Australian Height Datum
ALARP	As low as reasonably practical
CALM	Department of Conservation and Land Management
City	City of Busselton
DBCA	Department of Biodiversity, Conservation and Attractions
DEP	Department of Environment Protection
DER	Department of Environment Regulation
DME	Department of Mines and Energy
DWER	Department of Water and Environmental Regulation
DEC	Department of Environment and Conservation
DPaW	Department of Parks and Wildlife
EPA	Western Australian Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
Ha	Hectares (10,000 square meters)
MRWA	Main Roads Western Australia

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

PTA Public Transport Authority
PC Permit to Commence
RAMSAR International Convention on Wetlands, signed in Ramsar, Iran (1971)
Yd Yelverton (dry) forest type
Yw Yelverton (wet) forest type

Input has been provided by Landform Research



Landform Research

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Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

1.0 INTRODUCTION

1.1 Purpose of the Operations Environmental Management Plan (OOEMP)

The purpose of the OEMP is to identify the management approach which will be implemented during the planning, extraction and rehabilitation activities on-site at Lot 75 Haag Road, Yelverton. The management measures in the OEMP are aimed at minimising the amenity and environmental issues presented by an operating sand extraction concern within the local area.

The OEMP is to be used to manage the operation and is therefore written to be simple, practical and manageable for all stake holders and site personnel. The OEMP is not intended to document every scenario but rather to provide a framework for management of decision-making and general environmental awareness.

1.2 Scope of the Operations Environmental Management Plan

The scope covers all activities related to the extraction of sand from the site, including; onsite extraction, ancillary works, haulage of material to point of sale and off-site public works such as the recent \$178,000 road upgrade to the haulage route of Haag Road.

2.0 SUMMARY PROJECTION DESCRIPTION

This report section describes the activities, project layout and the project parameters and details environmental training, who is responsible for the extractive industry operation and the records to be maintained during the life of the operation.

2.1 Site Layout, Facilities and Traffic Management

The site has been laid out to accommodate a very low level of site presence and is in fact completely visually screened from all public roads in order to minimise the development on all adjacent land users.

Access to the site is provided by Haag Road which was upgraded by the pit operator at a cost to the property owner of \$178,000. Haag Road discharges onto Chambers Road which has been used for in excess of 15 years by the owners of Lot 4079 Chambers Road, Yelverton to deliver sand into the local civil and construction markets. Main Roads Western Australia (MRWA) has confirmed that the access point onto Bussell Highway is suitable for the proposed haulage activities.

A description of the transport and potential social impacts is provided at Section 5.3.4 Transport and Infrastructure in the Social Impact Assessment.

2.2 Project Staging

Extraction shall be conducted across 3 cells of approximately 2 ha, 2 ha and 1 ha.

The process is described in the attached Closure and Rehabilitation Plan and includes:

- a. removing large vegetation from each cell, including mulching or harvesting firewood for the owners hot water booster;
- b. removing approx. 100mm topsoil from each cell and stockpiling for re-use during rehabilitation;
- c. excavating and removing sand from each cell (indicatively to 2m extraction depth);
- d. returning topsoil over each cell and commencing rehabilitation progressively.

2.2.1 Vegetation Removal (where required)

The process is described in the attached Closure and Rehabilitation Plan.

A portion of the site requires clearing to enable extraction operations to progress within several cells. Rehabilitation and maximising the use of the resource will be aided by the following method where clearing is required:

Timber Claiming

The process is described in the attached Closure and Rehabilitation Plan.

All timber that can be used for higher use products (millable timber) shall be selectively removed from the cell area. Timber may be kept on-site for a period of time to cure, meet mill schedules or demand in the market. Logs stored on-site shall be stacked, no closer than 50 metres from the site boundaries, to afford further visual screening and noise attenuation for adjoining residents. All logs shall be milled off-site at Bay Woodworks.

Clearing Vegetation

The process is described in the attached Closure and Rehabilitation Plan and Section 3 of the Social Impact Assessment.

Timber will be recovered and vegetation retained for mulching, direct spreading as a seed source and land stabiliser with the logs providing habitat for fauna.

2.2.2 Topsoil Removal

The process is described in the attached Closure and Rehabilitation Plan and Section 3 of the Social Impact Assessment.

Topsoil will be recovered and retained for use in land closure and revegetation.

2.2.3 Sand Extraction

The process is described in the attached in Section 3 of the Social Impact Assessment.

Extraction shall be carried out utilising the equipment listed in section 2.2.6.

Work on the subsequent cell will commence during extraction of the previous cell to ensure that only one cell at a time would be operating as a working extraction cell, whilst the second cell undergoes preparation works (ie topsoil and organic matter removal) and previous cells are rehabilitated.

Rehabilitation of a cell will commence immediately upon completion of the sand extraction and reinstatement of the topsoil. Haul roads shall also be rehabilitated when the haul road is no longer in use.

2.2.4 Volume of Sand

Test pits dug on-site indicate that approximately 250,000 cubic metres of material but the actual extent of the sand is difficult to estimate.

2.2.5 Pit Form

The pit will be worked in three stages of 2.0 ha, 2.0 ha and 1.0 ha.

Cell closure will be to local native vegetation on batter slopes of around 1 : 4 vertical to horizontal and no steeper than 1 : 1, with a relatively flat excavated floor.

2.2.6 Equipment

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

The equipment used on site will consist on the following:

- Caterpillar 20 Tonne front end loader
- Caterpillar D11 Bulldozer
- Watercart Truck
- 9, 24 and 45 Tonne Haulage trucks

3.0 ENVIRONMENTAL MANAGEMENT RESPONSIBILITIES

3.1 Environmental Management During Operations

3.1.1 Noise and Dust Management

Noise and air emissions are often sensitive matters for certain segments of the community with most concerns principally related to the local amenity impact. The nearest affected receptors in relation to noise and dust emissions are located to the north of the site and are in excess of 500m from the cell work areas. Noise and air quality risks and impacts shall be implemented and monitored with the following measures:

Table 1: Noise and dust management responsibilities

Aspect	Management Measure	Application
Noise	Operations restricted to 7am-6pm Monday to Friday (exclusive of public holidays).	Site Manager
	Vehicle exhausts fitted with mufflers in good working order. Vehicles inspected regularly by pit operator mobile mechanic.	Site Manager Pit Operator Mobile Mechanic
	Vegetation barriers (<i>pinus pinea</i>) and blue gum plantings already established on site boundary.	Site Manager Property Owner
	Noise emissions complaint to <i>Environment Projection (Noise) Regulations 1997</i>	Site Manager
Dust & Air Quality	Dust minimised. Water applied to haulage route as required to minimise any risk of dust impacting adjacent residences/sensitive land uses.	Site Manager
	Long term stockpiles stabilised appropriate to minimise dust (refer Section 2.2.2)	Site Manager
	Vehicle exhausts maintained in good working order with any vehicles visibly smoking not used on site until repaired.	Site Managers Truck Operators Earth Moving Operators
	Vegetation barriers (<i>pinus pinea</i>) and blue gum plantings already established on site boundary.	Site Manager Property Owner

3.1.2 Road Monitoring

The key attribute to the development proposal is the short proximity to major arterial traffic routes (Bussell Highway) and the minor distances to travel to the major nodes of development as identified in the City of Busselton's planning strategies. The haulage route only requires 1km of Chambers and Haag Roads to be traversed from the site to the heavy haulage route of Bussell Highway. If not well managed, road damage from heavy haulage can result in undue pavement wear and resultant issues related to this (ie road safety, road sealing damage, impacts on local municipality budgets).

Evidence of these issues were photographically documented during the supply of sand to the MRWA Vasse-Dunsborough Bypass Project from the adjoining property with truck movements in excess of 280 per day to supply Macca Civil with the sand sub-base for the project (*Busselton Dunsborough Times Friday 22 May 2015*) which utilized the identical haulage route along Chambers Road.

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

To manage the impact of the local road network, the following measures will be implemented and monitored:

Table 2: Transport management responsibilities

Aspect	Management Measure	Application
Road Standard	The crossover from the private haul road to Haag Road has been upgraded at the cost to the property owner.	Property Owner
	Access to the private haul road to be maintained for use by haulage traffic.	Site Manager
	MRWA has confirmed the intersection of Chambers Road and Bussell Hwy is suitable for haulage prior to commencement of activities.	Site Manager
Repair and Maintenance	Where damage to the local roads is solely attributed to haulage from the development, roads shall be repaired	Site Manager
	A road maintenance bond of \$10,000 shall be lodged with the City to ensure damage solely attributable to the development is repaired	Pit Operator

3.1.3 Site Drainage, Water Quality Control

There is no surface water on site. Only one ephemeral waterway, running through the northern boundary of the property and off the site to a neighbouring dam, which is too far away to be impacted.

Control measures include minimising disturbed area (progressive work fronts and rehabilitation), silt entrainment reduction measures (shallow drains of a gentle gradient) and physical silt removal measures (sediment traps, swale drains, silt fences, retarding basins etc.)

All precipitation will be retained in the base of the pit.

To manage water quality, as well as manage chemical and fuels on site, the following measures will be implemented and monitored:

Table 3: Water management responsibilities

Aspect	Management Measure	Application
Drainage and Sediment Control		Site Manager
	Stockpiles will not have batters steeper than 1:1.	Site Manager Earthmoving operators
	Progressive rehabilitation will be undertaken to minimise the surface area disturbed soil.	Site Manager Earthmoving operators
Protection of the Water Table	The final surface will be maintained at > 0.5 metres to the highest known water table.	Site Manager
Closure	A Closure and Rehabilitation Plan has been prepared and approved by DWER as part of Clearing Permit CPS 8863. This includes closure of	Site Manager Land Owner

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

	the site, final land surface, allocation of Conservation Covenants and improvements to and management of flora and vegetation.	
HAZCHEM Management	All fixed fuel tanks and chemical stores (if any) will be bunded to provide a secondary leak barrier. Bunds will be routinely monitored for signs of leaks	Site Manager
	Spills will be minimised through the use of bunds and drips trays.	All personnel
	Where spills do occur, suitable spill cleanup equipment (spill kits or similar) will used to capture all split material and dispose of this appropriately.	All personnel

3.1.4 Quarantine – Dieback and Weeds

Phytophthora (or dieback) has the potential to devastate tracts of native vegetation as is evident from the damage caused to the vegetation on the site.

Care must be taken during operations to ensure that the pathogen is not spread to high quality native vegetation. As well as pathogens, if not carefully managed, vehicles and equipment can also harbour weeds onto the property or transferring them from the property, generally by seed.

To manage quarantine issues, the following measures will be implemented and monitored:

Table 4: Dieback and weed management responsibilities

Aspect	Management Measure	Application
Phytophthora	All earth moving equipment will be thoroughly cleaned using water and phytocide rinse prior to leaving site. In dry conditions, brushing may be used in preference to washing in accordance with DWER guidance.	Site Manager Earthmoving operators
	Topsoil shall be stripped and stockpiled separately outside the extraction area.	Site manager
	Haul trucks shall be kept to haul roads as far as practicable and as a preference will come into contact with subsoil/ sand only.	Site manager Truck Operators
	Recipients of fill will be notified that <i>Phytophthora</i> may be present in fill material and that the material should not be used near sensitive native vegetation.	Site manager Truck operators
	Vehicle and pedestrian traffics will be prohibited from accessing the southern conversation block without approval from the Site Manager and wheels and/ or boots will be washed prior to entry if approval is granted.	All personnel
Weeds	All excavators coming to or from the site will be washed thoroughly at their point of origin prior to ravel to limit the potential for spreading weeds.	Site manager Earthmoving operators
	Vehicle and pedestrian traffics will be prohibited	

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

	from accessing the southern conversation block without approval from the Site Manager and wheels and/ or boots will be washed prior to entry if approval is granted.	
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3.1.5 Flora and Fauna, Site Buffering and Rehabilitation

The project is aiming for a net increase in the quality of vegetation, the protection of that vegetation and hence the availability of high-quality habitat within the Shire. To protect flora and fauna, protect and enhance existing site buffering and ensure rehabilitation of the site successful, the following measures will be implemented and monitored:

Table 5: Flora and vegetation management responsibilities

Aspect	Management Measure	Application
Flora and Fauna	No-go areas will be flagged using clearly visible tape prior to works	Site Manager
	There will be no trenches or pits opened that do not have provision for animals escape.	Site Manager Earthmoving Operators
	The southern portion of the site will be protected via a native vegetation covenant, or a revegetated wildlife corridor will be established on site as documented in Section 2.2.5	Site Manager
	A Closure and Rehabilitation Plan has been prepared and approved by DWER as part of Clearing Permit CPS 8863. This includes the protection and management of flora and vegetation on Lot 75.	Site Manager Landholder
Site Buffering	Site buffering will planted and maintained in accordance with the Landscape/ Visual Screening Plan (Attachment 2).	Site Manager
Rehabilitation	Topsoil shall be stripped and stockpiled separately for re-use during rehabilitation.	Site Manager
	The site shall be progressively rehabilitated. Rehabilitation works shall be practically complete prior to extraction works progressing to the cell two forward in the sequence.	Site Manager
	Work areas will be re-topsoiled and rehabilitated to pasture (see relevant section of this OEMP)	Site Manager Earthmoving Operators
	Hollow logs and other remnant material shall be utilised in replanted patches of trees to enhance early habitat quality	Site Manager
	A Closure and Rehabilitation Plan has been prepared and approved by DWER as part of Clearing Permit CPS 8863. This includes closure of the site, final land surface, allocation of Conservation Covenants and improvements to and management of flora and vegetation.	Site Manager Land Owner

4.0 IMPLEMENTATION

This section details how the management measures detailed in the OEMP are implemented.

4.1 Organisational Structure, Roles and Responsibilities

Responsibilities covered by this OEMP are assigned to individuals or in some cases groups of personnel to ensure that each action has an accountable party. Table 4.1 lists the general duties personnel have under this OEMP. Section 3 details specific roles and responsibilities of personnel relating to the sound environmental management of the operation.

Table 6: On site roles and responsibilities

Roles	Responsibilities under the OEMP
Site Manager	Implementation of the OEMP and all the management measure therein Compliance reporting to the City and other statutory authorities Monitoring and documentation All liaison with regulatory agencies
Earthmoving Operators	Adherence to all applicable on-site management measures
General Employees	Adherence to all relevant onsite management requirements
Truck Operators	Adherence to the school bus restrictions and site operating hours Adherence to all relevant onsite management measures
Subcontractors and Service Providers	Adherence to applicable on-site management measures

The City contact officer will be formally advised of the contact details of the Site Manager prior to works commencing and prior to any change of this key site contact. All correspondence in relation to the development should be directed to this contact. At the discretion of the property owner, the contact person may be either the property owner or a contractor representing the property owner.

4.2 Contractual Controls

In addition to this OEMP, several contractual arrangements are in place to ensure that the environmental controls specified for this development are followed. These are listed in Table 4.2.

Table 7: Contractual arrangements

Title	Contractual Matters	Contract Parties
Performance Bonds	Cover road repair and road maintenance	City and Pit Operator
Sand Extraction Licence	Covers the City's requirements for accepting responsibility for implementing the conditions of Development Approval	Property Owner and Pit Operator

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

4.3 Environmental Monitoring and Incident Records

Routine monitoring is an integral part of sound environmental management, so that issues can be identified early and management steps put in place to be minimise any environmental impacts arising. Routine and non-routine monitoring will be undertaken in accordance with Table 4.3

Table 8: Monitoring requirements

Regularity	Monitoring Undertaken
Weekly	Truck movements
Bi-annually	Compliance Review by a suitably qualified surveyor, detailing: <ul style="list-style-type: none"> - The extent of extraction that has occurred in cubic metres - Expected completion of extraction (250,000m³) at current extraction rate - Extent of rehabilitation undertaken in accordance with planning permission
As Required	Records of complaints Records of incidents where a breach of the OEMP has occurred

4.4 Reports

Routine and non-routine reports will be provided to the City in accordance with Table 4.4

Table 9: Reporting requirements

Report	When/ Who	Timeframe for Submission
Bi- annual Compliance Review	Six monthly from the date of the permit commence extraction, by a suitably qualified surveyor	Within 1 month after each six month period
Complaints and incidents reporting	After incident or complaint, by the Site Manager	Verbal notification within the next business day. Hard copy within 5 business days.

4.5 Documentation

The following documentation and records will be maintained:

- daily quantity of sand extracted (estimated)
- daily truck movements
- incident reports
- environmental monitoring records
- complaints or infringement notices (if any)
- material Safety Data Sheets (as required)

4.6 Management of Complaints

Any query or complaint shall be courteously received, thoroughly investigated by the Pit Operator and closed out a response provided to the complainant. A copy of any complaint will be forwarded through to the City contact officer for information. Recorded information that shall include:

- date and time of call/query;
- name of the person receiving the call/information;

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

- name and contact details of the caller/ informant (if provided);
- details of the query or complaint;
- action to follow-up on the complaint; and,
- response provided to the caller.

It is expected that the City's Compliance Officer, upon receiving a similar query, would forward similar details of the query to the Site Manager to follow-up.

4.7 Training

All personnel working on the project will be provided with a level of training relevant to their site duties, including:

- all full time site personnel will be comprehensively taken through the OEMP and requirements within it.
- all truck operators will be advised of the haulage-specific period requirements and the requirements relating to school bus hours.
- all service providers and sub-contractors involved in the specific elements of the work will be advised of specific elements of the OEMP relevant to their scope. This will be determined by the City Officer (or delegate) on a case by case basis and may take the form of a visitor induction or Job Safety and Environmental Assessment 'JSEA' prior to their scope of work commencing.

4.8 Review

The OEMP will be periodically reviewed to ensure that it accurately reflects site controls, and captures project approval conditions. It will be reviewed by the Site Management in consultation with the City and, if amended, will be submitted for re-approval. The OEMP in force for the activity shall be used until approved by the City.

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

5.0 COMMITMENTS REGISTER

Table 10 captures the main commitments made in the description of the project and the social impact assessment, to ensure the commitments are carried through into operations. These commitments are generally in addition to any legislative requirements.

Table 10: Commitments register

Aspect	Commitment
General Management	The relevant sections of the DEP <i>Code of Practice for Extractive Industries (1990)</i> and DME <i>Environmental Management of Quarries</i> guidelines will be implemented
	An Environmental Management Plan for the site will be approved by Shire prior to operations commencing, in consultation with CALM.
Flora and Fauna	Native vegetation to be kept will be fenced or otherwise clearly indicated as no-clear zones.
	Extraction will be staged 2ha at a time and progressive rehabilitation will be undertaken.
Air Quality	Dust will be minimised. Water will be applied to haul roads if required to minimise any risk of dust impacting on adjacent residences or sensitive land uses.
	Long term stockpiles will established as appropriate to minimise dust
	Vehicle exhausts will be kept in good working order. Excessively noisy vehicles will be kept in good working order. Vehicles visibly smoking (after a suitable start-up period) will not be used on site until repaired)
Buffers	The following minimum buffer distances are to maintained: 500m to residence 100m to watercourse 100m to public road
Noise	Operations restricted to 7am-6pm Monday to Friday (excluding public holidays) or daylight hours if these are more restrictive (eg during winter)
	Vehicles will have mufflers fitted and in good working order. Excessively noisy vehicles will be inspected and mufflers repaired.
Surface and Ground Water	Spills will be minimised through the use of bunds and drip trays. Vehicle maintenance will be generally restricted to the pit operator's workshop.
	Where spills occur, spill cleanup equipment (spill kits or similar) will be used to capture all spill material. Contaminated soil shall be moved off-site to an appropriate facility.
	All fixed fuel tanks and chemical stores (if any) shall be fully bunded to provide a secondary leak barrier. Bunds shall be routinely monitored for signs of leaks.
	Stockpiles shall not have batters greater than 1:1.
	Progressive rehabilitation of project cells.
	Sediment controls shall be implemented on appropriate drainage lines, including the use of silt-stop fencing or straw bales as appropriate. Drains shall be designed to minimise water run-off velocities. Sediment traps shall be routinely monitored and cleared out as appropriate.
Quarantine	The Dieback Management Plan shall be implemented, including: <ul style="list-style-type: none"> vehicle wash own procedures and equipment

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

	<ul style="list-style-type: none"> notification to recipients of fill that phytophthora may be present an traffic to sensitive site areas, except where strict quarantine measures have been adhered to. <p>The Dieback Management Plan is developed with Department of DPaW and the City.</p>
Safety and Transport	<p>An internal haul road shall follow the east boundary of Lot 75 Haag Road, Yelverton and access Haag Road at the north-east corner of the site, approximately 1100 metres from Chambers Road intersection.</p> <p>Any damage to Chambers Road solely attributed to the project shall be repaired promptly.</p>
Queries and Complaints Handling	<p>A queries/complaints register shall be maintained and handled in accord with OEMP with an emphasis on resolving the issue raised and responding to the person who raised the issue promptly.</p>
Rehabilitation	<p>Topsoil will be stockpiled separately for use in rehabilitation.</p> <p>A portion of any native vegetation cleared will be mulched for utilisation in rehabilitation. Old 'habitat' logs shall be kept for use in rehabilitation in accord with the rehabilitation plan.</p> <p>Implementation of the selected rehabilitation plan.</p> <p>Rehabilitation to include dieback hardy species, preferably species that enhance habitat for selected species.</p>
Resource maximisation	<p>When clearing occurs, every effort will be made to maximise resource recovery (eg milling timber) in preference to burning.</p>
Visual Amenity	<p>Tree logs (if any) shall be used as appropriate to avoid further screening of the extraction operations.</p>

Social Impact Assessment

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

DEVELOPMENT APPLICATION (SAND EXTRACTION)

LOT 785 HAAG ROAD, YELVERTON

DEVELOPMENT APPLICATION



Version 2 Update – 16 October 2021

16 November 2021

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

This Development Application – Social Assessment has been updated to reflect the changes to the project made since the original submission. There have been no changes to the size and intensity of the project, transport or social factors.

Changes to the Proposal since Version 1 of September 2019.

Changes	Discussion
Pit Footprint	Reduction in the pit size to 5.1 hectares. Provision of three stages of operation.
Clearing Permit Application CPS 8863	The provision by DWER of an intention to issue a Clearing Permit by DWER; CPS 8863. See Landform Research2021, <i>Proposed Sand Excavation Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton CPS 8863/1.</i>
Rehabilitation	A Rehabilitation Plan has been approved by DWER as part of the assessment for the Clearing Permit CPS 8863 and that Rehabilitation Plan is therefore incorporated into the amended Development Application. See Landform Research2021, <i>Proposed Sand Excavation Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton CPS 8863/1.</i>
Conservation	Revegetation of the pit to local native vegetation rather than pasture. Upgrade of an additional 2.9 hectares of Degraded Banksia Woodland to Good Condition. Placement of 10.1 hectares of native vegetation in the south of Lot 75 under Conservation Covenant, including the restoration of the degraded areas. Revegetation of the small gravel pit and its inclusion under Conservation Covenant. Landform Research2021, <i>Proposed Sand Excavation Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton CPS 8863/1.</i>
Hydrogeology	The updated hydrogeological mapping and an updated Water Management Plan have been approved by DWER (Bunbury).
Development Application - Social Assessment	Updated to include the additional information.
Development Application – Environmental Management	Updated to include the additional information. Note that Rehabilitation Plan 1 October 2021 supersedes the previous revegetation program.
Additional Studies	Discussion
Hydrology	Updated Hydrological Mapping by Water Direct Pty Ltd. – August 2020. Water Direct Pty Ltd, August 2020 V2, <i>Hydrogeological Assessment Extractive Industries for S and C Threadgold, 157 Haag Road Yelverton.</i>
Rehabilitation	A Rehabilitation Plan has been approved by DWER as part of the assessment for the Clearing Permit CPS 8863 and that Rehabilitation Plan is therefore incorporated into the amended Development Application. – September 2021. Landform Research2021, <i>Proposed Sand Excavation Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton CPS 8863/1.</i>
Site Survey	Survey South 2020, <i>Feature Survey and Contour Plan of Lot 75 Haag Road Yelverton.</i>
Noise and Dust Management	Updated Dust and Noise Management Plans are included.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Fauna Assessment	Harewood G, 2019, <i>Targeted Fauna Assessment, Lot 75 Haag Road Yelverton.</i>
Environmental Assessment	Landform Research, 2020, Field inspection. Observed material is included in this Revegetation Plan.
Flora and Vegetation	Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. <i>Lot 75 Haag Road, Yelverton.</i>

Input has been provided by Landform Research



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Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

CONTENTS

1.0	EXECUTIVE SUMMARY	7
1.1	Project Summary	7
2.0	PROPOSAL	9
2.1	Location	9
2.2	Site History and Surrounding Land Uses	10
2.3	Surrounding Land Uses	11
3.0	PROJECT DESCRIPTION	13
3.1	Project Overview	13
3.2	Equipment Used	19
3.3	Operation Times	20
3.4	Haulage Routes	20
3.5	Quarantine and Dieback Management	21
3.6	Native Vegetation Management and Rehabilitation Strategy	21
3.7	Project Benefits	21
4.0	LEGISLATIVE FRAMEWORK	23
4.1	Applicable Legislation	23
4.2	Planning and Zoning	24
5.0	EXISTING ENVIRONMENT	28
5.1	Flora, Fauna and Biodiversity	28
5.1.1	Geology and Soils	28
5.1.2	Flora and Vegetation Assessment	28
5.1.3	Weed Management Plan	32
5.1.4	Dieback Management	32
5.1.5	Closure and Rehabilitation Strategy	33
5.1.6	Fauna	34
5.2	Natural and Cultural Heritage	35
5.2.1	Indigenous Cultural Heritage	35
5.2.2	Significant Natural Features	35
5.2.3	Non-Indigenous Cultural Heritage	35
5.3	Socio-Economic Factors	35
5.3.1	Tourism and Aesthetics	35
5.3.2	Primary Industry	35
5.3.3	Other Industry	36
5.3.4	Transport and Infrastructure	36
5.4	Complaints	37
6.0	RISK ASSESSMENT METHODOLOGY	38
6.1	Identifying Impacts	38
6.2	Identifying Risks	38
6.3	Ranking Identified Impacts and Risks	38
7.0	ENVIRONMENTAL IMPACT AND MANAGEMENT OF THE PROPOSAL	40
7.1	Flora, Fauna and Biodiversity	40
7.1.1	Flora and Vegetation	40
7.2	Noise	41
7.3	Air Emissions - Dust	45
	Tree Belts and Buffer Management	45
7.4	Ground and Surface Water	49
7.5	Transport and Infrastructure	52
7.7	Impact Assessment Summary	54
7.8	Framework Environmental Management Plan	54

FIGURES

Figure 1: Location of the project.....	9
Figure 2: Property boundaries.....	10
Figure 3: Surrounding properties.....	11
Figure 4: Land contours.....	14
Figure 5: Concept final contours.....	15
Figure 6: Water monitoring bore locations.....	16
Figure 7: Hydrogeology - water table elevations.....	17
Figure 8: Northwest - Southeast section, (see Figure 4).....	18
Figure 9: Plant communities.....	29
Figure 10: Vegetation condition.....	30
Figure 11: Typical vegetation on the resource area.....	31
Figure 12: Closure and conservatin areas.....	33
Figure 13: Water table elevations.....	49

TABLES

Table 1: Adjoining land.....	11
Table 2: Adjacent landuse.....	12
Table 3: Relevant Legislation.....	23
Table 4: EPBC Listed local fauna.....	34
Table 5: Impact and Risk Management to Flora and Vegetation.....	40
Table 6: Dust Risk (DWER 2011 Guidelines).....	46
Table 7: Water table risk and management.....	50
Table 8: Hydrology and Pit Floor Management.....	51
Table 9: Trtansport Risks and Management.....	52
Table 10: Visual risk and management.....	53

ATTACHMENTS - DOCUMENTATION

- Harewood G, 2019, *Targeted Fauna Assessment, Lot 75 Haag Road Yelverton.*
- Stream Environment and Water, 2018, *Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. Lot 75 Haag Road, Yelverton.*
- Survey South 2020, *Feature Survey and Contour Plan of Lot 75 Haag Road Yelverton.*
- Threadgold Architecture, 2021, *Development Application (Sand Extraction) – Social Impact Assessment, Lot 75 Haag Road.*
- Threadgold Architecture, 2021, *Operations Environmental Management Plan – Sand Extraction, Yelverton.*

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

- Water Direct Pty Ltd, August 2020 V2, Hydrogeological Assessment Extractive Industries Approval, for S and C Threadgold, 157 Haag Road Yelverton.
- Landform Research 2020, Proposed Sand Excavation, Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton.

ABBREVIATIONS

AHD	Australian Height Datum
ALARP	As low as reasonably practical
BCA	Building Code of Australia
CALM	Department of Conservation and Land Management
City	City of Busselton
DBCA	Department of Biodiversity, Conservation and Attractions
DEP	Department of Environment Protection
DER	Department of Environment Regulation
DME	Department of Mines and Energy
DWER	Department of Water and Environmental Regulation
DEC	Department of Environment and Conservation
DPaW	Department of Parks and Wildlife
EPA	Western Australian Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
Ha	Hectares (10,000 square meters)
MRWA	Main Roads Western Australia
PTA	Public Transport Authority
PC	Permit to Commence
RAMSAR	International Convention on Wetlands, signed in Ramsar, Iran (1971)
Yd	Yelverton (dry) forest type
Yw	Yelverton (wet) forest type
WAPC	Western Australian Planning Commission

1.0 EXECUTIVE SUMMARY

1.1 Project Summary

The property owner is seeking to develop land at Lot 75 Haag Road, Yelverton for the purposes of sand extraction to the extent previously approved by Council in accord with DA12/0338. The project will supply the local building and construction industry, Main Roads WA projects and civil works with an estimated 250,000 m3 of fine grade building sand and fill material over a five year period.

The principal markets to be supplied with this depleting resource are Busselton, Vasse and Dunsborough areas which are still experiencing prolonged growth.

The project is sited close to major road infrastructure, located approximately two kilometres from Bussell Highway. The project is sited between two previously approved sand mining sites; namely Lot 2 Haag Road and Lot 4079 Chambers Road, Yelverton immediately adjacent to the proposed site. The proposed site has degraded native vegetation due to grazing and de-watering by reduced Australian Height Datum (AHD) levels on the adjacent site Lot 4079 Chambers Road, Yelverton (DA15/0007, DA10/0306 et al). There are two strategies proposed to offset the loss of native vegetation and promote a positive environmental outcome. These strategies include; planting a corridor of suitably dieback hardy native vegetation to link patches of high quality remnant vegetation to the south and north or protect an area of high quality and significant remnant vegetation in the southern portion of the property in perpetuity under a nature covenant.

The operating times will be from 7am - 6pm Monday to Friday, excluding Public Holidays, as there are no school buses currently using the proposed haulage route. The pit operator has demonstrated commitment to these times throughout DA12/0388 and has an excellent record at the City. The project provides employment to several local full time civil works employees, administration employees and truck operators. The project will supply raw material to the building/construction and civil works markets. The key benefits to the City and local community include:

Flora and habitat outcomes: The project will result in either the long term security of a tract of significant native vegetation that is poorly represented in the City or the connection of two detached remnant pockets of native vegetation via a habitat corridor. Either option provides positive long-term benefits to the indigenous flora and fauna within the City.

Industry Consolidation: centralising impacts adjacent to already approved extractive industry operations will lessen the impact of sand mining across the City as a whole in comparison to locating a sand operation in a presently unimpacted area.

Meeting the market need: The growing City requires raw material to continue the positive growth seen in the building sector, stimulating the regional economy and providing employment to the civil works sector as identified at the 2 May 2019 City Extractive Industry Forum convened by the City.

Market Competition: introduction of an additional supply into the local market and greater security of supply for the building/construction and civil works industries.

Reduced Carbon Emissions: the close proximity to all three major building and civil works markets ensures that the amount of diesel fuel required to cart the resources to the building sites in Busselton, Dunsborough and Vasse is far less than almost all other extraction operations based in the municipality.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Utilisation of a significant primary resource: The project makes use of a valuable resource now and by maintaining topsoil and committing to a comprehensive rehabilitation program, ensures that use of the land by future generations is not compromised.

2.0 PROPOSAL

2.1 Location

The property known as Lot 75 Haag Road, Yelverton is located only 20 kilometres southwest of Busselton and 2 kilometres west of Bussell Hwy as shown in Figure 1. The property has an approximate 400 metre wide frontage to the Haag Road Reserve along the northern boundary. The other boundaries of the site of approximately 900m adjoin private agricultural land currently used for grazing livestock. The southern edge of the property has a 212m by 483m rectangular portion of remnant bush.



Figure 1: Location of the project

The property which the project is to be located is approximately 48.8 hectares (Ha) in area and comprises approximately:

- 40% cleared pastoral land
- 40% native vegetation which shows severe degradation due to the presence of die-back and stock grazing
- 20% that retains significant remnant vegetation characteristics and has been excluded from the project cells.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2



Figure 2: Property boundaries

2.2 Site History and Surrounding Land Uses

The late 1970's to early 1980's saw the initial clearing of the native vegetation from the property, in particular the northern part of the block as well as selected areas in the centre and western portions. These areas were cleared due to the more advantageous soil characteristics for stock grazing. The property remainder, where the poorer soils of high sand content were not cleared to maintain shelter for stock and stabilize the sand ridges. Approximately 20 Ha was cleared and developed for pastoral use.

Since the 1980's, there has been no intentional clearing of the remaining vegetation. Over this timeframe the native vegetation has deteriorated to the extent that there is little remnant vegetation remaining in the northern and southern central sections. The degradation is likely due to the pressure from stock grazing, camping and dewatering from the reduced Australian Height Datum levels from mining on Lot 4079 Chambers Road, Yelverton.

Figure 3 illustrates a January 2017 aerial photograph of the project site, showing the study area identified for the social impact assessment and illustrating the key features of the local area. The reference numbers on figure 3 are linked to descriptions of:

- natural and infrastructure features in Table 1
- adjacent land uses in Table 2

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2



Figure 3: Surrounding properties

Table 1: Adjoining land

Ref	Classification	Description	Distance from Site
A	Arterial	Bussell Highway	2km
B	B road	Chambers Road (sealed)	1km
C	C road	Chambers Road (unsealed)	1km
D	C road	Haag Road (unsealed/upgraded by property owner)	Adjoins property
E	Waterway	Mary Brook	250m
F	Waterway	Annie Brook	250m

Access to the property is currently provided off Haag Road which has recently been upgraded by the property owner and the sealed section of Chambers Road. It services a number of local dwellings and one business of rural character, as indicated in Table 2.

Haag Road currently terminates at the entrance to the property but the road easement continues west which has thick vegetation. The haulage route down Haag Road continues approx. 1.1km before accessing the sealed portion of Chambers Roads at a T intersection. The shortest haulage route, of approximately 1km, to in close proximity to Bussell Hwy continues down the sealed portion of Chambers Road.

2.3 Surrounding Land Uses

The subject land is surrounded by land largely used for rural agricultural industry with development approval for sand extraction on Lot 4079 Chambers Road, Yelverton expiring on 31 March 2017. The land uses are outlined in Table 2 with reference identification numbers shown in Figure 3.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Table 2: Adjacent landuse

Ref	Classification	Description	Direction	Distance
1	Subject Land	Previously used for Extractive Industry.	N/A	N/A
2	Extractive Industry/grazing	For approx. 15 years, this land has been subject to an extractive industry licence. Currently under rehabilitation work.	E	Adjacent
3	Rural Dwelling	Rural dwelling surrounded by dense vegetation.	NE	900m
4	Rural Dwelling	Rural dwelling surrounded by dense vegetation.	NE	800m
5	Rural Dwelling	Rural dwelling surrounded by dense vegetation.	NE	>1km
6	Rural Dwelling/Grazing	Rural dwelling with the surrounding property used for grazing.	N	750m
7	Rural Dwelling/Viticulture	Rural dwelling partially covered by native vegetation and vineyard.	NW	800m
8	Tourist Accommodation	Tourist accommodation within dense native vegetation.	NNW	>1km
9	Grazing	Land used for stock grazing.	W	Adjacent
10	Grazing	Land used for stock grazing.	SW	Adjacent
11	Rural Dwelling/Grazing	Rural dwelling with partially vegetated grazing land. Crossed by Mary Brook.	S	>1km
12	Rural Dwelling/Grazing	Rural dwelling with partially vegetated grazing land. Crossed by Mary Brook.	S-SE	>1km
13	Grazing	Rural dwelling with partially vegetated grazing land. Crossed by Mary Brook. It is understood that there may be Glamping Tents located in bushland 500 metres from the proposed sand excavation.	S-SE	400m residence
14	Grazing	Rural dwelling.	E-SE	>1km

3.0 PROJECT DESCRIPTION

3.1 Project Overview

It's proposed to extract sand from the property to meet the market for basic building materials in the local area. Preliminary investigations on the quality and quantity of sand in-situ within the project area indicate approximately 250,000 cubic metres of resource.

To assess the extent of the resource and it's suitability for market, test pits were dug at various locations across the property and total depth of sand measured. The test data was interpreted to smooth out the data across the site and provide interpolated sand depth contours. This information has been overlaid over contour and aerial information, taking into account environmental factors such as proximity to dwellings and separation distances required, to determine the most appropriate project area.

The material will fall into two basic categories:

- fine grade sand for use in the building/construction sector
- fill material for general use in road construction, land sub-divisions and other civil works

It is proposed to extract the sand across three cells of approximately 2 x 2 hectare stages and a 1 hectare stage, carried out in the following manner:

- remove large vegetation from cell (mulch or firewood where this is practicable)
- remove topsoil from the cell to a designated stockpile location for stockpiling and re-use during rehabilitation
- excavate and remove fill and sand from cell
- return topsoil over cell
- commence rehabilitation program
- Vegetation Removal (where required)

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

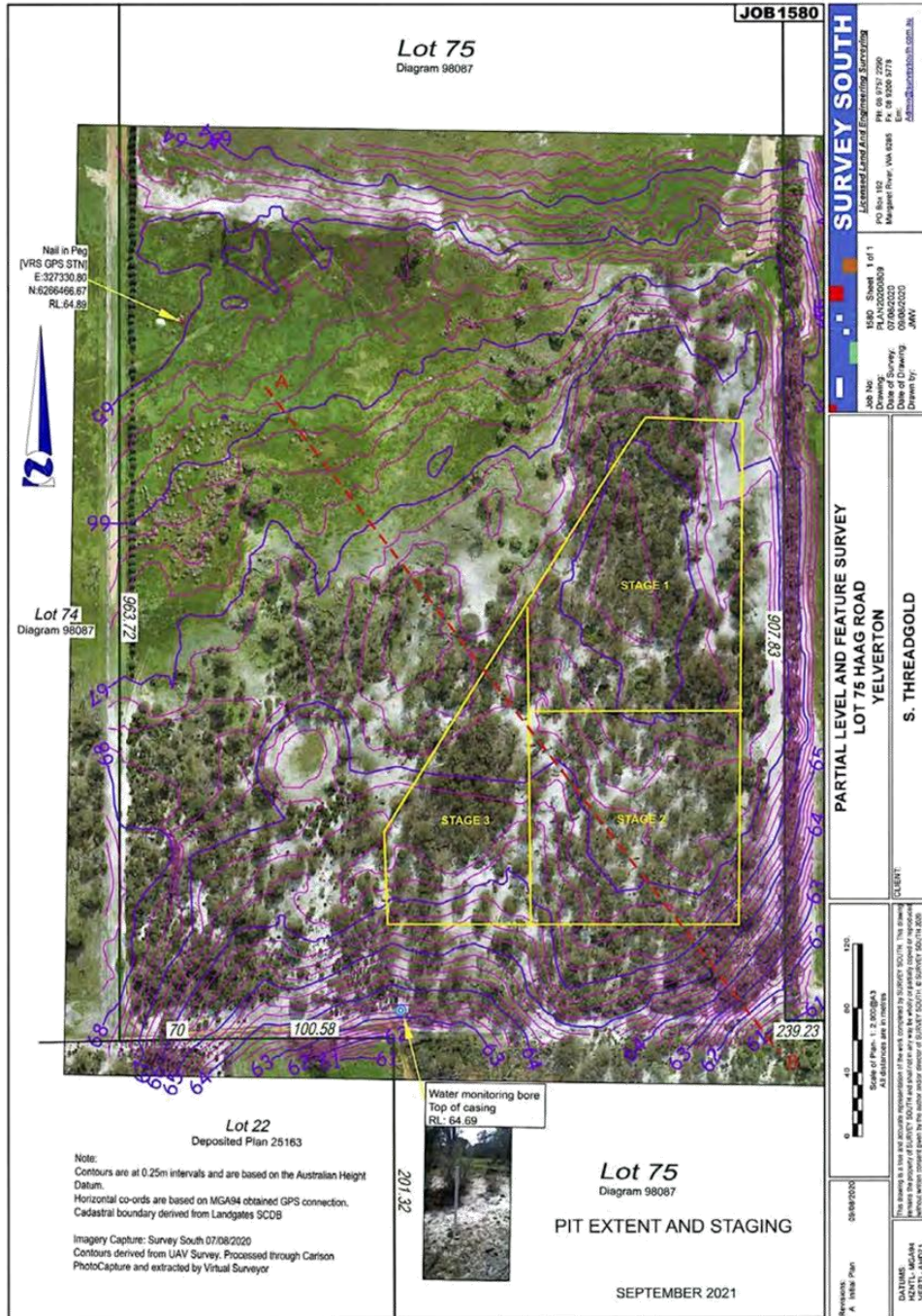


Figure 4: Land contours

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

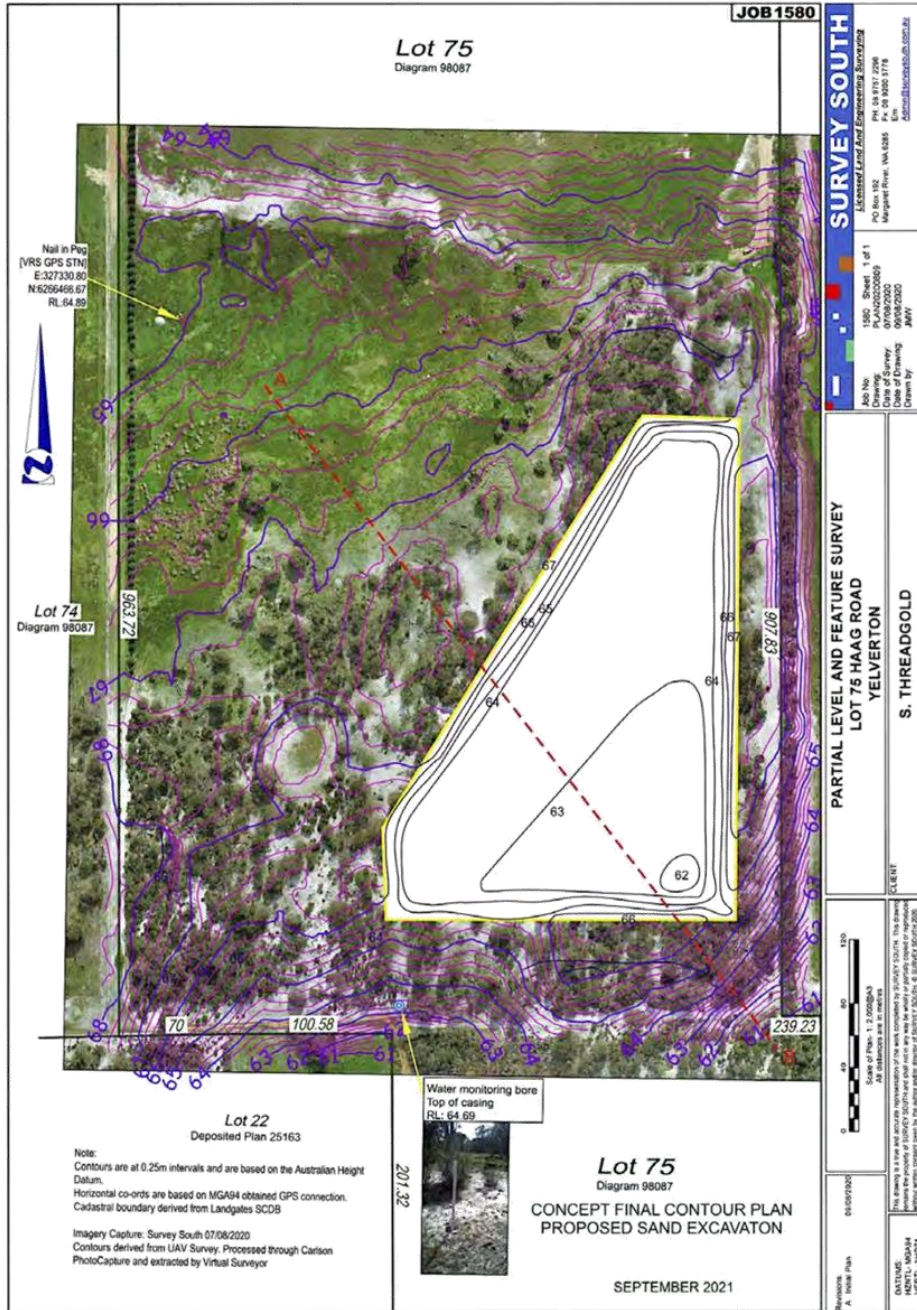


Figure 5: Concept final contours

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

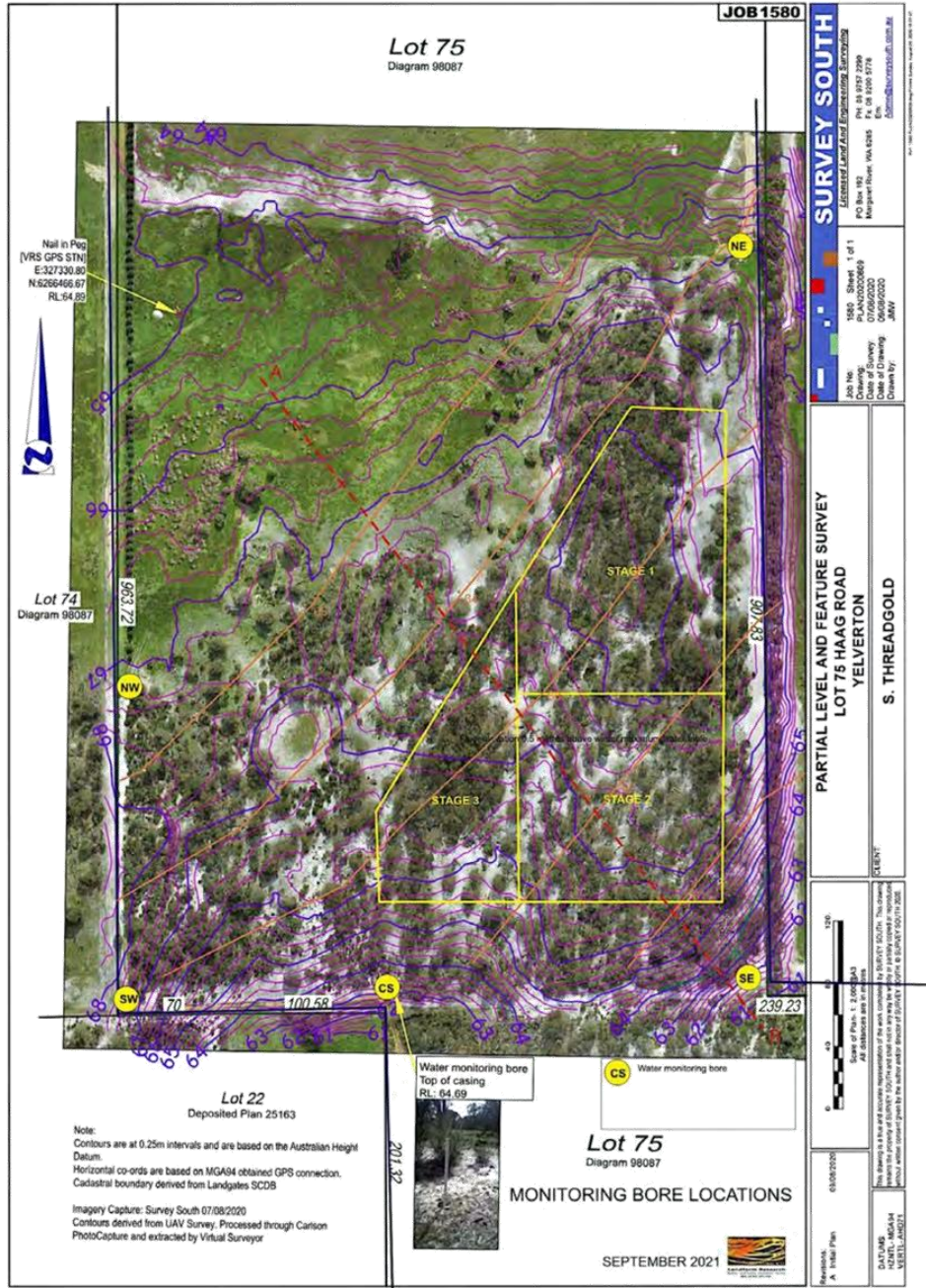


Figure 6: Water monitoring bore locations

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

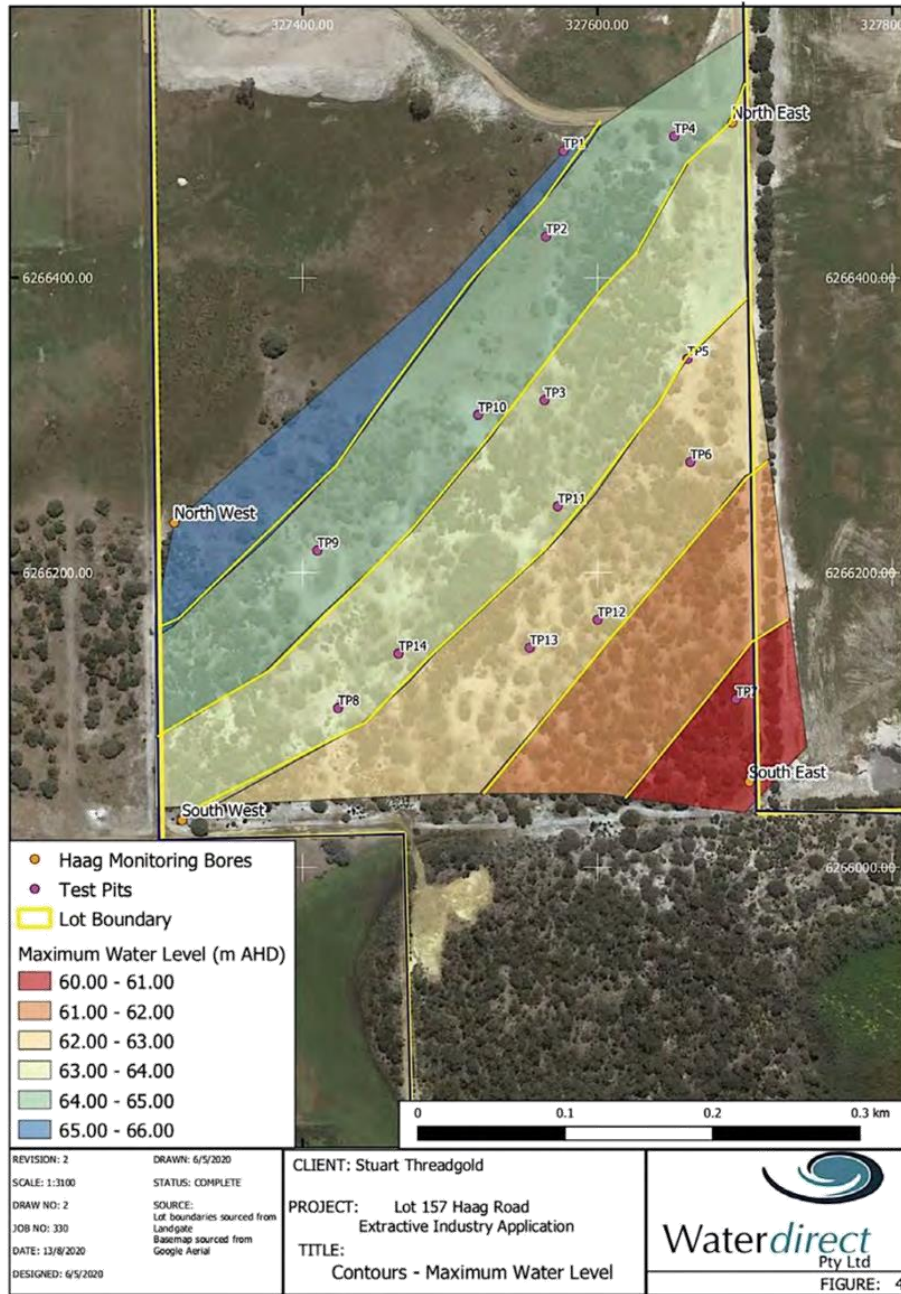


Figure 7: Hydrogeology - water table elevations

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

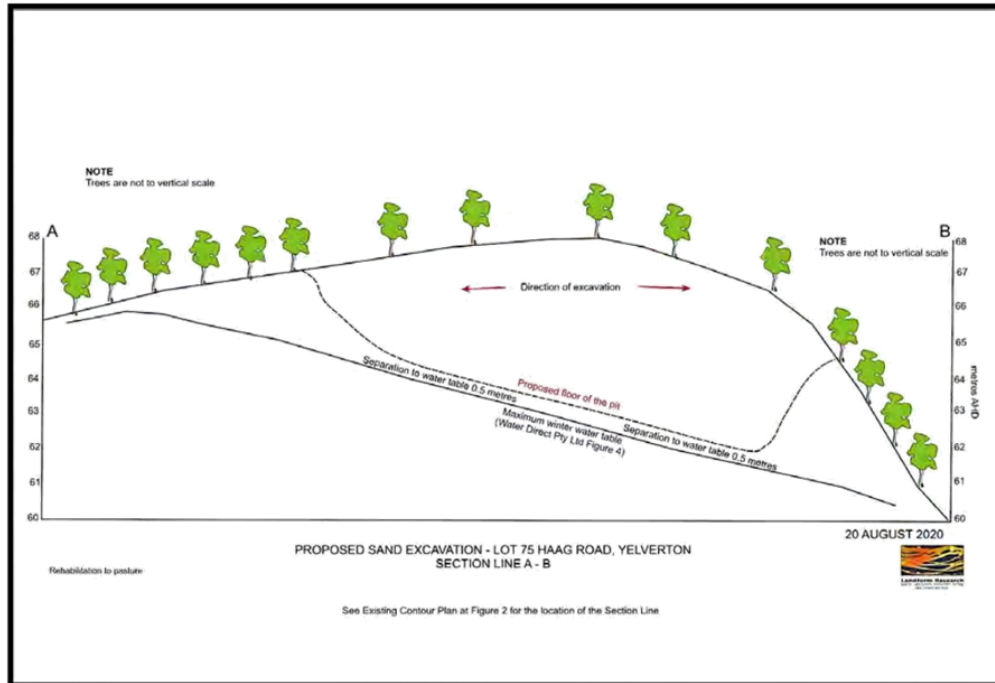


Figure 8: Northwest - Southeast section, (see Figure 4).

A portion of the site requires clearing to enable extraction operations to progress within the stages.

To aid rehabilitation and maximise resource use, the following method will be used where clearing is required: (See the attached Closure and Rehabilitation Plan for CPS 8863/1 which is approved by DWER).

All timber that can be used for higher use products (ie timber that can be milled) will be selectively removed from the entire work area. Typical equipment used for this operation would include chainsaws and grab-equipped excavators. Timber may then be kept on-site for a period of time to cure, meet mill schedules or market demand. Timber stored on-site can be stacked to avoid further visual screening and noise attenuation. A minimum buffer of 50m from site boundary will be maintained for any timber stacks. Logs will be transported off-site and milled at Bay Woodworks, injecting further funds into the local economy and stimulating local employment.

After usable timber has been selectively harvested, remaining vegetation will be removed across one cell only (the project cell be worked). The treatment options available to maximise the beneficial use of removed vegetation will depend on the proposed rehabilitation method used. If a vegetation corridor option is selected, a portion of the vegetative material will be mulched on site and stored in the designated storage area for use in rehabilitation. Large dead logs will be stored separately to provide early habitat for ground dwelling fauna during the early rehabilitation.

A portion of the vegetation will be mulched and hollow logs kept separate to assist rehabilitation of selective plantings. A buffer area will be provided between felled vegetation on the cell to be worked and surrounding cells to ensure that only vegetation from the cleared cell is burnt.

Burning, if required, will be subject to fire control restrictions and restrictions may result in the order of cell progression being shuffled to restrict vegetated cell use to periods of low fire danger. Both options ensure that all organic material (excluding large millable timber) is restricted to site, minimising the potential for a spread of *phytophthora cinnamomi*.

Topsoil Removal

Prior to extraction operations commencing within a stage/cell, the organic layer of soil shall be stripped. For the first cell, the topsoil will be stockpiled around the perimeter of the working area. All topsoil removed from the next cell will be directly transferred and spread out over the previous cell. A loader will be used to complete stripping operations. (See the attached Closure and Rehabilitation Plan for CPS 8863/1 which is approved by DWER).

Topsoil storage bunds will be created to minimise the risk of dust or sediment runoff. Batters will not be made steeper than 1:1 gradient and light compaction will be applied to minimise dust or sediment run-off. The topsoil bunds will be monitored for dust and erosion. If dust or erosion was identified as an issue; a range of options can be utilized, including:

- jute matting
- watering
- planting with sterile grass seed
- surrounding mound with silt-stop fencing
- covering with geofabric

Sand Extraction

Extraction shall be undertaken using the equipment listed in Section 3.2.

Work on the subsequent cell shall commence during extraction of the previous cell to ensure that only one cell at a time would be operating as a working extraction cell, whilst the second cell undergoes preparation works (ie topsoil and organic matter removal) and previous cells are rehabilitated.

Test pits dug on-site indicate that approximately 250,000 cubic metres of material but the actual extent of the sand is difficult to estimate. Consideration should be given to an in-situ sand quantity of 225,000 - 275,000 cubic metres of sand (ie 10% variance).

3.2 Equipment Used

- The equipment used on site will consist on the following:
- Caterpillar 20 Tonne front end loader
- Caterpillar D11 Bulldozer
- watercart truck
- 9, 24 and 45 Tonne Haulage trucks as required

Based on the anticipated project life of 5 years, sand will be extracted at a rate of approximately 192 bulk cubic metres per day or 221 loose cubic metres. Based on utilising a semi-tipper truck system, standard in the haulage industry, this results in 11.7 truck movements per day.

3.3 Operation Times

It is envisaged that the project will generate employment for several people, both operating equipment and managing the site. Truck haulage and support service requirements (rehabilitation, service providers etc) will indirectly employ a further number of personnel over the life of the Project. It is likely that these jobs would be generated within the local community.

Extraction will take place between the hours of 7am to 6pm Monday to Friday excluding Public Holidays. No extraction work will be undertaken outside of these hours, including weekends.

Transportation of product on local roads (not including Bussell Highway) will not be conducted during times when school buses are operating (refer to Section 3.4).

There are no school age children in the immediate vicinity of the site that require public transport to and from public nor private schools, either on Haag Road nor Chambers Road; and therefore the truck haulage route will not affect the PTA's school bus service.

3.4 Haulage Routes

Sand has been extracted from Lot 75 previously without incident and also from the adjoining lot to the east, on the current road network.

Haag Road is suitable for haulage vehicle movements after a recent privately funded road upgrade by the property owner and successful sand haulage under DA12/0338. The City's Director of Planning has provided written evidence to the property owner that the section of Chambers Road south of the Haag Road intersection is currently suitable for heavy traffic of the type and volume required to support this type of development, having been upgraded to this standard by the neighbouring sand extraction development.

It is understood that the extractive industry on Lot 4079 Chambers Road supplied the MRWA Vasse-Dunsborough Bypass project at a rate of in-excess of truck movements a day via the southern end of Chambers Road.

The section of Chambers Road north of Haag Road intersection, in its current (unsealed) form is unsuitable for more than infrequent heavy vehicle movements;

- Bussell Highway is the most appropriate means of transporting extracted material to the proposed markets of Vasse, Busselton and surrounds;
- the most direct route from local roads to highway is preferred, as these classes of road are designed to handle heavy vehicles and larger volumes of traffic.; and
- there are no school bus routes operating along Haag and Chambers Roads as there are no school age children using public bus transport.

The site access option considered most suitable incorporates Haag Road and the southern sealed portion of Chambers Road to intersect the recently upgraded Bussell Highway carried out by Macca Civil on behalf of MRWA.

The 1km section of Chambers Road at which this Haag Road accesses was upgraded (sealed) by the developer of Lot 4079 Chambers Road, Yelverton to serve for sand extraction haulage purposes.

During the DA15/0007 consultation process, the City's Director of Planning provided written advice to the property owner that no further upgrading of Chambers Road was seen as necessary as the City has upgraded the Chambers Road bridge during the extension of sand extraction activities on Lot 4079 Chambers Road to supply the MAWA Vasse-Dunsborough Bypass project.

3.5 Quarantine and Dieback Management

It has been noted that there are significant areas of vegetation dying within the Yelverton (Yd) areas of remnant vegetation on-site. One known root cause of die-off in native vegetation is attributed to the presence of *phytophthora cinnamom* (dieback), however; dieback testing completed by DPaW on 27 October 2017 as part of the requirements of supplying sand to the City produced a negative result for the presence of *phytophthora cinnamom*. The report is attached as Appendix D.

Management of dieback will be undertaken on site in accordance with an approved Phytophthora Management Plan, which is included at Section 8.2 of the Closure and Rehabilitation Plan Clearing Permit CPS 8863/1.

3.6 Native Vegetation Management and Rehabilitation Strategy

The site is partially vegetated at present.

Whilst it's recognised that the clearing of remnant vegetation is undesirable, it is considered likely that the quality of the remnant vegetation will continue to degrade and biodiversity diminish. Rehabilitation with *phytophthora cinnamom* resistant species, selective rehabilitation and offset mechanisms are described in this alternative approach to vegetation management. This approach is proposed to ensure that the project delivers economic benefit previously described, whilst still resulting in a positive outcome in the medium and long term with regard to the quality and quantity of native vegetation in the City.

The Closure and revegetation is covered by the Closure and Rehabilitation Plan for Clearing Permit CPS 8863/1. The Closure and rehabilitation Plan has been approved by DWER.

3.7 Project Benefits

The coastal local government of Busselton has experienced strong urban growth and will continue to do so as there is migration of the population to the region for lifestyle choices, growth through tourism and for primary industry has caused more land to be planned and released for future development.

The WAPC have examined residential lot trends and identified there are more dwellings being constructed than lots being created: <http://www.wapc.wa.gov.au/publications/development/busselton/BDLRP.pdf>

The major benefits to the City and community are:

Meeting the Market Need

The growing City requires basic raw materials to continue the positive growth evidenced in the building and construction.

Market Competition

Economics in a marketplace such as Australia dictates that additional supply options favour the customer, providing more diversity of choice to the customer and increasing the security of supply. The addition of this extraction point to the marketplace should increase competition and create downward pressure on earthworks pricing.

Reduced Carbon Emissions

Approval of this sand extraction operation will ensure that building and civil construction projects in Busselton, Dunsborough and Vasse construction sites will require/emit less carbon by reduced volumes of diesel to transport the sand resource for clean fill as identified through the Green Building Council of Australia's internationally-recognised sustainability rating system called Green Star. This is based on the supply of sand from a close source.

Flora and habitat outcomes

This project will result in either the long term security by Conservation Covenant of a tract of significant native vegetation that is poorly represented in the City, or the connection of two detached remnant pockets of vegetation via a habitat corridor. Either option provides positive long-term benefits of the indigenous flora and fauna within the City.

Utilisation of a significant primary resource: Currently, the land is used for dryland grazing purposes and demonstrates little capacity for intensive agriculture. The project seeks to maximise the use of an in-situ natural resource and improve the quality of the land, whilst not jeopardising its future use as either farmland (topsoil is to be retained and used to reinstate the project area) or an alternative use.

4.0 LEGISLATIVE FRAMEWORK

The following section outlines the regulatory regime under this project is to be assessed and managed. A summary of specifically relevant legislation, policies and industry guidelines is provided in Section 4.1 and specific Council Planning Policies, Guidelines and Strategies applicable to this Project are discussed in Section 4.2.

4.1 Applicable Legislation

A range of Commonwealth, State and local legislation, policies and guidelines apply to the proposal, as well as several industry codes of practice covering the operation of extractive industries and these are discussed within Table 6.

Table 3: Relevant Legislation

Commonwealth Legislation	
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	The EPBC Act requires that proponents consider the impact of their proposals on matter of National Environmental Significant (NES) as defined by the Act and, where matters have the potential to cause significant impact on matters of NES, refer the proposal to the Department of Environment and Heritage for assessment.
State and Local Legislation, Policies and Guidelines	
<i>Environmental Protection Act 1986</i>	This Act provides for an Environmental Protection Authority, for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment.
<i>Conservation and Land Management Act 1984</i>	The Act intends to make better provision for the use, protection and management of certain public lands and waters, and put steps in place to protect significant flora and fauna. Part of this Act is to enact the powers of the Conservation and Land Management Authority to be responsible for administering and enforcing the Act.
<i>Wildlife Conservation Act 1950</i>	This Act provides for the conservation and protection of wildlife, including providing a listing of all declared native flora and fauna within the State.
<i>Soil and Land Conservation Act 1945</i>	An Act relating to the conservation of soil and land resources, and to the mitigation of the effects of erosion, salinity and flooding. Specifically, this Act also allows for the protection of native flora via conservation covenants.
<i>City of Busselton Local Planning Scheme No 21</i>	The Local Planning Scheme provides strategic direction to the Council to guide, amongst other things, planning and infrastructure decisions with the Shire. [Discussed further in Section 4.2]
<i>City of Busselton 'Local Planning Policy No. 5A'</i>	This Policy guides proponents of extractive industry proposals on the City approvals process and provides advice to proponents on what key issues will require consideration in the planning, operation and

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

	rehabilitation phases of extractive industry developments. It also guides City officers as to how proposed extractive industries should be assessed and approved. [Discussed further in Section 4.2]
<i>City of Busselton 'Local Planning Policy No. 8B'</i>	This Policy presents a guide to the preparation of a social impact assessment for any development that requires an assessment to be prepared for a development within the City. [Discussed further in Section 4.2]
<i>Mines Safety and Inspection Act 1994</i>	This Act regulates mining operations, including the inspection and regulation of mines and substances supplied to or used at mines, to promote health and safety.
<i>Department of Mines and Petroleum 'Guideline for Mining Proposals in Western Australia'</i>	Designed to deliver an outcome-based assessment for the approval process.

The specific requirements of these instruments are required to be addressed throughout the entire life- of the project, from planning and preparation, through operation to site rehabilitation. Key requirements have been addressed in design and via commitments covered in this Development Application.

4.2 Planning and Zoning

The subject land is zoned Agriculture. The City's Local Planning Scheme No 21 permits sand extraction of this nature within the Agriculture Zone. Objectives of the zone specifically relevant to this Project are:

"...To preserve the productive potential of rural land..."
"...To enable the development of land for other purposes where it can be demonstrated by the applicant that suitable land or building for the proposed purposes are not available elsewhere and that such purposes with not detrimentally affect the amenity of any existing or proposed nearby development..."
"..To control the clearing of trees and encourage generally the retention of vegetation corridors concomitant with the agricultural use of the land..."

In relation to Clause (i), both rehabilitation plans proposed result in a continuation of the land for rural purposes, substantively in keeping with current agricultural uses. Recent local examples of rehabilitated extractive industry cells at 616 Yelverton Road, Yelverton and Lot 4079 Chambers Road, Yelverton demonstrate improved pasture cultivation due to the removal of low nutritional sand that does not support strong pasture grasses.

In relation to Clause (iv), the social impact assessment concludes that evidence from previous extractive industry directly adjacent to the Project, coupled with the stringent environmental management practices proposed, demonstrate that sand extraction from this site is not detrimentally affect the amenity of any existing or proposed nearby development. The exploration of alternative options to fulfil the market need for sand and building fill presented demonstrates that there are few, if any, alternate sites that present a better environmental and social outcome than the Project proposed.

In relation to Clause (xi) it is contended that both rehabilitation options proposed with this Project further this objective in the medium and long term by either a) fully developing a vegetation corridor between large strands of native vegetation to the north and south, or b) securing the permanent retention of a high quality stand of remnant vegetation under a restrictive conservation covenant, an area highlighted in the 'Rural Areas and Land Use and Development Policy' as being of natural landscape significance.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

The scheme requires that planning consent be obtained for this Project. It also requires that certain information be provided to the Council for assessment of any application for planning consent. This Development Application is intended to satisfy Council requirements in regard to these matters.

The City's 'Local Planning Policy No. 5A' divides the City into three areas of classification. This development falls in the eastern side of Policy Area 2 which is defined as 'constrained' for extractive industries. The objective of this zone is:

"To allow the extraction of available resources where such operations have due regards to the significant constraints of the area, the particular site and surrounding uses."

The application recognizes that regardless of the location of a project of this nature, due environmental care must be taken during all stages, including planning and rehabilitation as well as operations. Key constraints have been identified through consultation with local stakeholders and the City, as well as utilizing experienced environmental personnel during the planning phase of the Project. The social impact assessment concludes that extraction of this valuable resource can be undertaken in such a way that the significant environmental and amenity values of this area will not be detrimentally affected. Environmentally conscious site planning, consideration of project staging, site environmental controls, coupled with the rehabilitation plan proposed will ensure impacts on the site itself are minimised. Other specific requirements of Policy Area 2 are detailed following.

Local Planning Policy Provisions relating to residences and businesses:

"...4.2.2.1 Policy Area 2: No extractive industry operations to be located within 500m of any tourist accommodation/attraction, where the owners of such object to the proposal..."

See Appendix G. A buffer of approximately 800m is provided to the nearest tourist accommodation, which is to the north.

"...4.2.2.2 Policy Area 2 and 3: No extractive industry is to be located within 500m of a residence where the owner of resident of such objects to the proposal..."

See Appendix G. Only one residential dwelling falls within 500m to the project area, at a distance of approximately 400m. All other residences lie outside the 500m buffer. In addition, it is noted that only a small portion of the project would impinge on the 500m buffer with this residence, scheduled for the last stages of the project life. The majority of extraction operations occur well over 700m from this nearest residence. A substantive vegetation buffer is also in place along Haag Road that further increases the protection of adjacent residents and adjoining properties from any potential amenity impacts.

A precedent was established contrary to Local Planning Policy No. 5A - Provision 4.2.2.3 and within Policy Area 2 through DA15/0007 whereby the City approving extractive industry operations on Lot 4079 Chambers Road, Yelverton situated:

- 124 metres from a dwelling at 117 Haag Road, Yelverton
- 291 metres from a dwelling at 157 Haag Road, Yelverton
- 290 metres from a dwelling at 116 Haag Road, Yelverton
- 294 metres from a dwelling at 84 Haag Road, Yelverton
- 370 metres from a dwelling at 82 Haag Road, Yelverton

The City's variance of Provision 4.2.2.3 in DA15/0007 was been confirmed in writing by CEO Michael Archer on 10 September 2015 as this formed the basis of the 29 June 2016 SAT directions hearing 'Credaro & Ors v City of Busselton' which was convened on-site at the corner of Haag and Chambers Road, Yelverton.

"...4.2.2.3 Policy Areas 2 and 3: Notwithstanding 6.2.1 and 6.2.2 above, the extraction of sand and limestone may be located less than 500m but generally no closer than 300m from a sensitive land use dependent upon the nature and scale of the operation and the content of a Dust and Noise Management Plan..."

It is important to note that only sand and fill extraction is proposed. No blasting, crushing or similar activities are proposed that would be likely to trigger a requirement for stringent adherence to a 500m buffer. Equipment to be use will be equivalent to large farm machinery (tractors and the like), common within the rural environment.

"...4.2.2.5 Where an extractive industry is approved within 1km of a residence or tourist accommodation or attraction, additional conditions to reduce amenity impact from noise and dust may be imposed, including operating times..."

Several residences fall within 1km of the perimeter of the development and, although the full working area will not be under production at any one stage, operational hours have been restricted to ensure amenity is protected. In particular, extraction is restricted to daylight hours of 7am – 6pm Monday to Friday. All activities will therefore be undertaken within standard working hours, fully protecting local amenity during evenings and weekends. Dust has not proven to be a problem on the adjacent sand extraction development and, with the addition of the thick vegetation buffer for this project, it should prove similarly not to create a dust issue, however mitigation measures to be implemented include staged and progressive rehabilitation, access arrangement that provide substantive buffers to nearby residence and the use of water carts if required to suppress dust from project activities.

Local Planning Policy Provisions relating to protecting the natural environment:

"...4.2.3.1 Extractive industry is to incorporate a wetland buffer and be setback a minimum of 100m from all wetlands, and at least 50m from dams and drains unless a greater or lesser setback is required in accordance with the Waters and Rivers Position Statement: Wetlands..."

The Project development layout provides a minimum of a 100m buffer to all watercourses and wetlands DA15/0007 created a precedent of varying Local Planning Policy No. 5A - Provision 4.2.3.1 on Lot 4079 Chambers Road, Yelverton were sited 40m from wetlands in the Haag Road reserve have within Policy Area 2. On 17 August 2015, the City's CEO confirmed variance of Local Planning Policy No. 5A - Provision 4.2.3.1 in writing to the property owner.

"...4.2.3.2 Extractive industry to be prohibited in areas of rare and endangered flora and fauna, threatened or poorly-represented ecological communities..."

Information on flora, fauna and threatened communities is presented in Section 5.2. The application shall be forwarded to the DWER as a part of the clearing approvals process and further investigation into whether rare or threatened species may be present.

In summary, one of the rehabilitation offset options would see covenants in place over an area of high natural significance as a poorly represented vegetation community (Yelverton (wet). An application for consent to clear has been lodged with the DWER concurrent with this application.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Local Planning Policy Provisions relating to visual amenity:

"...4.2.4.1 Extractive industry to effectively screened from all public roads..."

Haag Road screening provides an excellent and well established visual barrier to the site. Planning of the progression of cell extraction also means that the cells nearest a public road will be extracted after the middle cells, providing further visual amelioration and screening. Blue gum screening along the eastern boundary prevent any viewing of the extractive industry operation from the two nearest roads (Haag and Chambers Roads)

A greater than 200m buffer is provided and the site cannot be viewed from along Haag Road due to the mature peppermint tree line on Lot 75 Haag Road.

"...4.2.4.3 Extractive industry to be effectively screened from all major tourist routes..."

There are no major tourist routes in proximity to the Project.

"...4.2.4.5 Applications to comply with all other relevant Council policy, including the Caves Road Visual Management Policy, LNRSP - Land Use Policies P.S. 3.4 and 3.6 and the Rural Strategy, where not inconsistent with this Policy..."

The Project lies outside the area considered by the Caves Road Visual Management Policy.

Local Planning Policy Provisions relating to traffic management and roads:

"...4.2.5.2 Where it is proposed to operate haulage operations on roads that are designated school bus routes, operating times shall not be during, nor within 15 minutes of scheduled school bus times..."

The City's variance of Policy Provision 6.5.1 in relation to DA15/0007 has been confirmed in writing by CEO Michael Archer on 17 August 2015 and 10 September 2015.

"...4.2.5.1 A determination of the impact of the proposal on the current road infrastructure and need for a road upgrading condition, will be made in accordance with the requirements of Schedule 1..."

There are no school age children residing on Haag Road nor Chambers Road requiring school bus transport. Both Haag Road and Chambers Roads are suitable to handle semi-trailer trucks, having been upgraded by the property owner and the proponents of DA15/0007 for the sand extraction adjacent to the project site. It is considered that the length of public road required to be used for this proposal prior to the Bussell Highway (1km of Chambers Road) represents the shortest distance to a major road of any sand extraction development within the City. It is contended that the distance to a major arterial road offered in this case is a significant positive in terms of protecting regional amenity.

5.0 EXISTING ENVIRONMENT

5.1 Flora, Fauna and Biodiversity

5.1.1 Geology and Soils

The geology is described in Water Direct Pty Ltd. The resource lies on the Yelverton Shelf, Weaving S, 1998, *Geographe Bay Catchment, Natural Resource Atlas*, DPIRD (Department of Agriculture).

The soils of the resource area are well described in Tille P J and N C Lantzke, 1990, *Busselton – Margaret River Land Capability Study*, DPIRD (Department of Agriculture) Land Resource Series No 5 as Yd, Yelverton Deep Sandy Flats and Low Slopes.

On this site only the overlying sand sheet is impacted by excavation and consists of deep leached quartz sands.

The soils and excavation of sands are well known from the other sand pits that have operated and currently operate across the local area.

The resource typically has a grey sand overburden up to 100 mm thick over leached white silica sand grading to yellow sand.

A series of test pits were sunk across the sand resource to verify the sand. The location of the test pits are shown in Water Direct Pty Ltd 2020, Figure 2, which is attached.

5.1.2 Flora and Vegetation Assessment

Stream Environment and Water, 2018, completed a flora and vegetation survey of Lot 75. This added to a previous survey conducted by Eco Logic Environmental Services 2013, the data of which is incorporated into the current survey.

The field survey recorded 108 taxa of vascular plants from 37 families.

Thirteen of the 108 taxa are introduced. An additional 11 species (including 4 introduced species) were recorded in the previous survey by Ecological Environmental Services (2013) but were not recorded during the current project.

The dominant families in terms of number of taxa recorded (including all species from both surveys) were Myrtaceae with 12 taxa, Asteraceae with 10, Poaceae and Fabaceae both with 9 taxa.

No state listed DRF or priority flora species, or federally listed threatened flora species, were recorded in the project area in the current survey. The previous survey by Eco Logic Environmental Services (2013) recorded the priority 3 species *Stylidium loweriana*.

See the attached Closure and Rehabilitation Plan for CPS 8863/1, which is approved by DWER.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

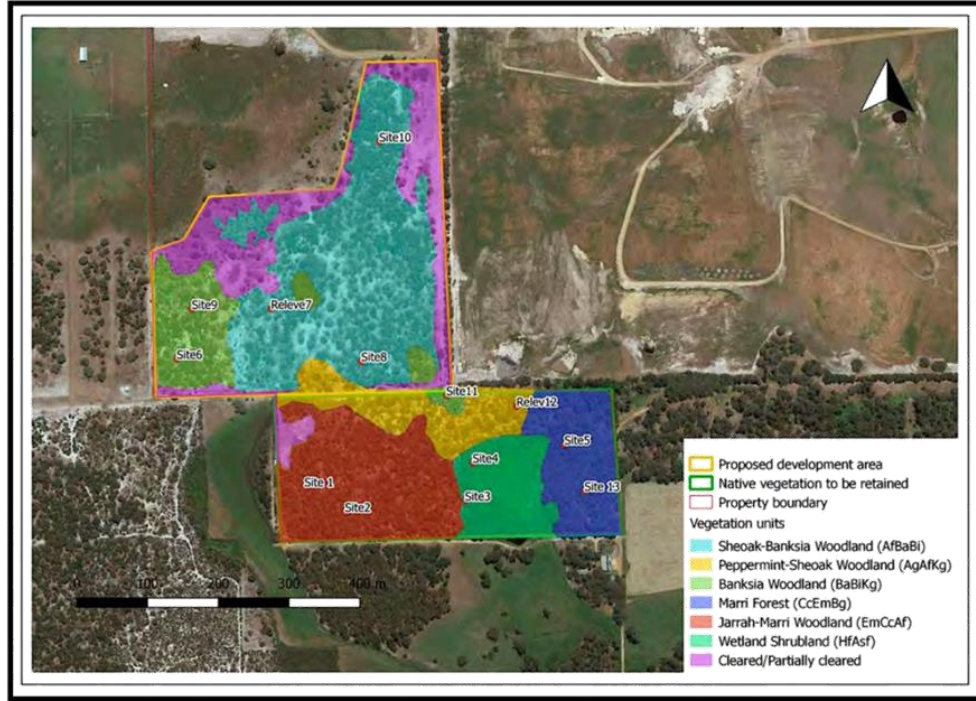


Figure 9: Plant communities

Both the **Banksia Woodland (BaBiKg)** and the **Sheoak-Banksia Woodland (AfBaBi)** are consistent with the diagnostic characteristics of the **Banksia Woodland** of the Swan Coastal Plain TEC (listed under EPBC Act as Endangered and under State policy as Priority 3).

The wetland area mapped as **Wetland Shrubland (HfAsf)** has possible affinities to the Priority 1 Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (G2) vegetation community. The landform is consistent with the description given by Keighery et al. (2008) for west Whicher Scarp valley wetlands of vegetation communities associated with permanent/near permanent wetlands fed by persistent freshwater seepages.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

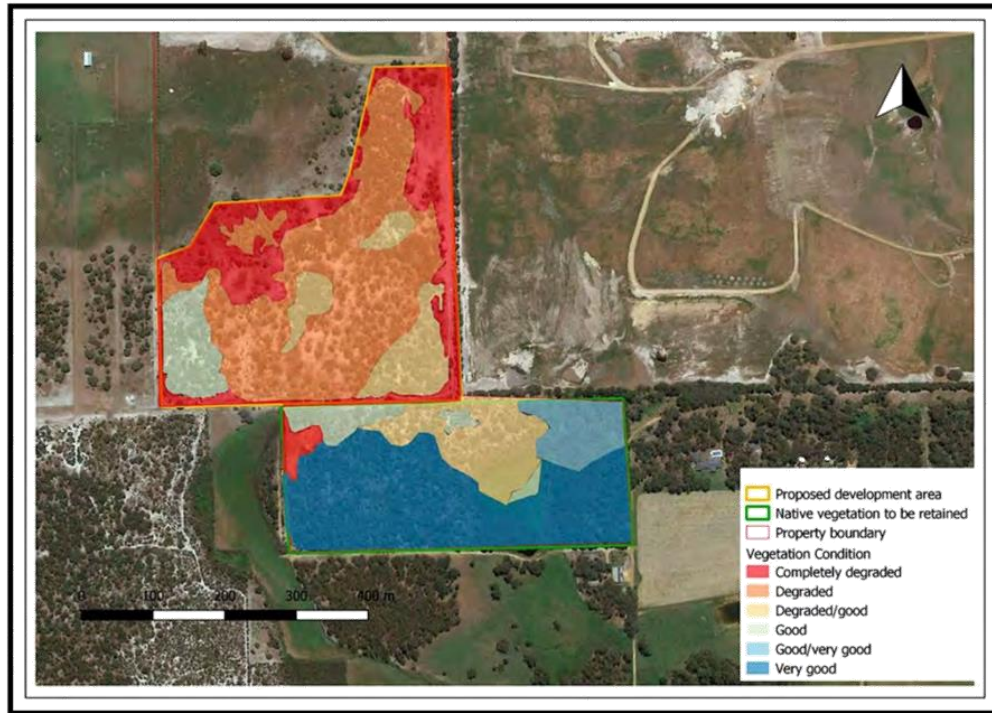


Figure 10: Vegetation condition

The TEC structure is typically low woodland to forest with a canopy dominated or co-dominated by a number of *Banksia* species, including as in this case *Banksia attenuata* (Commonwealth of Australia 2016). None of the contra-indicators i.e. dominant or co-dominant species such as *Banksia littoralis* are present in this community.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**



Figure 11: Typical vegetation on the resource area

The Sheoak-*Banksia* Woodland (AfBaBi) has affinities with the State listed Priority 1 West Whicher Scarp *Banksia attenuata* woodland (B2) (which is a component of the EPBC listed *Banksia* Woodland of the Swan Coastal Plain TEC). However, the poor condition of the vegetation and disturbed nature of the understorey in particular, meant that definitive identification of the priority ecological community was difficult. *Kunzea glabrescens* also produces dense thickets that reduce the understorey and ground cover species.

Stream Environment and Water 2018 mapped 11.9 ha of *Banksia* woodland consistent with the characteristics of the federally listed *Banksia* Woodlands of the Swan Coastal plain threatened ecological community in the potential development area.

Of the 11.9 hectares, only 1.3 ha was in good condition and therefore meets the minimum requirement to be classified as the TEC but is under the minimum patch size of 2ha. **As the *Banksia* Woodland in Good Condition is below the patch size for referral to the Commonwealth under the EPBC 1999 listing, no referral is necessary.** (See the attached Closure and Rehabilitation Plan for CPS 8863/1 which is approved by DWER).

Two of the thirteen introduced flora species recorded during the survey, are listed as declared pest plants under the *Biosecurity and Agriculture Management Act (2007)*, *Asparagus asparagoides* (bridal creeper) and *Zantedeschia aethiopica* (Arum lily) although Stream Environmental and Water did not map the weed species for this project.

The vegetation is too degraded for sample plots to be effective and these were not completed by *Stream Environment and Water 2018*. However the vegetation descriptions of the proposed pit and the vegetation on the land to be protected as a Conservation Covenant provide the baseline local vegetation data. From that data the proposed Completion Criteria has been developed and is appropriate and achievable, based on revegetation of other sand pits in similar soils and parkland pasture. See the attached Flora and Vegetation Survey completed by Stream Environment and Water.

Therefore the location of reference sites are not applicable to this site.

The site is so degraded and has an absence of understorey that it was not possible for Stream Environment and Water to use 100 m² plots to assess the quality of the vegetation already on site.

It should be noted that not all plant communities have the same number of plants, and reduced species richness and plant density can be natural. *Agonis flexuosa* and *Allocasuarina fraseriana* produce phytotoxins to reduce competition from understorey and other trees.

In plant communities where these plants are prominent, the species richness and plant density is normally much less. Such communities can appear and even be listed as “Degraded” when they are in fact in “Good” or better condition. The test really is the number of exotic species rather than the lack of species richness and plant density.

On site reduced plant density and species richness can be expected to occur naturally in Peppermint-Sheoak Woodland (AgAfKg

5.1.3 Weed Management Plan

Thirteen of the 108 taxa are introduced. An additional 11 species (including 4 introduced species) were recorded in the previous survey by Ecological Environmental Services (2013) but were not recorded during the current project.

Two of the thirteen introduced flora species recorded during the survey, are listed as declared pest plants under the Biosecurity and Agriculture Management Act (2007), *Asparagus asparagoides* (bridal creeper) and *Zantedeschia aethiopica* (Arum lily) although Stream Environmental and Water did not map the weed species for this project.

Management of weeds will be undertaken on site in accordance with an approved Phytophthora Management Plan, which is included at Section 8.2 of the Closure and Rehabilitation Plan Clearing Permit CPS 8863/1.

5.1.4 Dieback Management

It has been noted that there are significant areas of vegetation dying within the Yelverton (Yd) areas of remnant vegetation on-site. One known root cause of die-off in native vegetation is attributed to the presence of *phytophthora cinnamon* (dieback), however; dieback testing completed by DPaW on 27 October 2017 as part of the requirements of supplying sand to the City produced a negative result for the presence of *phytophthora cinnamon*. The report is attached as Appendix D.

Management of dieback will be undertaken on site in accordance with an approved Phytophthora Management Plan, which is included at Section 8.2 of the Closure and Rehabilitation Plan Clearing Permit CPS 8863/1.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

5.1.5 Closure and Rehabilitation Strategy

The Closure and revegetation is covered by the Closure and Rehabilitation Plan for Clearing Permit CPS 8863/1. The Closure and rehabilitation Plan has been approved by DWER.

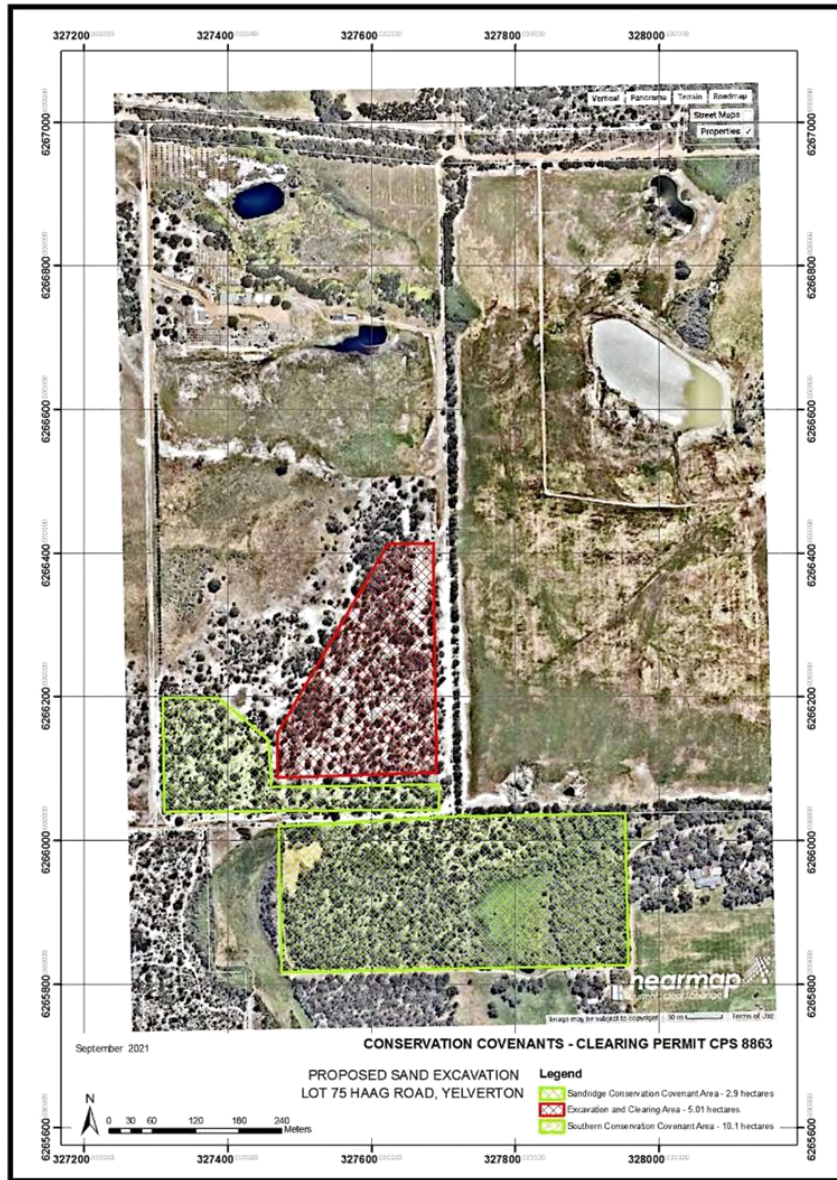


Figure 12: Closure and conservation areas

5.1.6 Fauna

Greg Harewood completed a Targeted fauna assessment in 2019 (Harewood G, 2019, Targeted Fauna Assessment, Lot 75 Haag Road Yelverton).

The main fauna identified as being potentially present and of significance are the Western Ring Tail Possum and the three species of Black Cockatoo.

During the survey, trees with hollows were recorded and checked for suitability and use by fauna. The site does lie within the distribution of **Western Ringtail Possums**. However the site investigations conducted by Greg Harewood did not find any evidence of their presence on Lot 75.

If present the species utilise *Agonis* Peppermint, Jarrah and *Nuytsia* as food sources, all of which are present on the proposed pit footprint. The surrounding perimeter vegetation is to be retained and the large area of vegetation in the south will be retained under Conservation Covenant.

In order to increase the suitable habitat for Ring Tail Possums, it is proposed to add more local native vegetation, particularly *Agonis* Peppermint and Jarrah, which will be added in the vegetation retained and on the batter slopes to increase the habitat and vegetation connectivity for Western Ring Tail Possums. The habitat suitable for **Black Cockatoos** was assessed. Greg Harewood found twelve trees with a trunk diameter of >500 mm. Six appeared to contain hollows but none large enough for use as Black Cockatoo nesting. No roosting trees were recorded. The vegetation on the pit footprint provides foraging habitat for one or more species.

- Harewood G, 2019, Targeted Fauna Assessment, Lot 75 Haag Road Yelverton.
- Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. *Lot 75 Haag Road, Yelverton*.

Table 4: EPBC Listed local fauna

Wetlands of International Significance		
Vasse-Wonnerup System	Within same catchment as RAMSAR site	
Threatened Species	Status	Likelihood
<i>Calyptorhynchus baudinii</i> (Baudin's Black-Cockatoo, Lon-billed Black-Cockatoo)	Endangered	Species or species habitat likely to occur within area
<i>Dasyurus geoffroyi</i> (Chiditch, Western Quoll)	Vulnerable	Species or species habitat likely to occur within area
<i>Pseudocheirus occidentalis</i> (Western Ringtail Possum)	Critically Endangered	Species or species habitat likely to occur within area
Migratory Territorial Species	Status	Likelihood
<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)	Migratory	Species or species habitat likely to occur within area
<i>Apus pacificus</i> (Fork-tailed Swift)	Listed- overfly marine area	Species or species habitat may occur within area
<i>Ardea alba</i> (Great Egret, White Egret)	Listed- overfly marine area	Species or species habitat may occur within area

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Ardea ibis (Cattle Egret)	Listed- overfly marine area	Species or species habitat may occur within area
Merops ornatus (Rainbow Bee-eater)	Listed- overfly marine area	Species or species habitat may occur within area

5.2 Natural and Cultural Heritage

5.2.1 Indigenous Cultural Heritage

A search of the WA Atlas database indicated that there are no known sites of aboriginal significance within the project footprint. The property has been used for agricultural activity for approximately 30 years. Being freehold private land, the project area is not subject to Native Title.

5.2.2 Significant Natural Features

The project lies within the catchment area of the Vasse-Wonnerup wetland, which is listed under RAMSAR. The key wetland features are remote from the proposed development, however several feeder streams (namely Annie Brook and Mary Brook) feed eventually into this system.

No geological features or key landforms of significance were identified within the project footprint.

5.2.3 Non-Indigenous Cultural Heritage

There are no known sites of non-aboriginal cultural heritage within the project footprint. All sites of cultural heritage within the City are considered far enough removed from the project footprint to not be considered further in this assessment.

5.3 Socio-Economic Factors

5.3.1 Tourism and Aesthetics

Evidence suggests that rural retreats and eco-tourism are filling an increasingly popular market for tourists and holidaymakers from urban centres such as Perth, or interstate and international visitors. The region from Margaret River to Busselton and Bunbury is dotted with bed and breakfast rural accommodation ventures in proximity to the project, although one is over 1km away and accessed by a separate road network. The other is located at the northern end of a landholding whose south east boundary adjoins the north west corner of Lot 75 Haag Road.

The surrounding landscape, particularly to the west, is characterised by spectacular coastal and geological scenery. To the west, Caves Road is recognised as a popular tourist route, in part because of access to coastal towns and popular tourist destinations/centres (Yallingup, Dunsborough, Leeuwin Naturaliste Lighthouse, etc.) and in part because of the natural aesthetics of the surrounds.

5.3.2 Primary Industry

The region still maintains a predominantly rural character and much of the surrounding land is devoted to dryland grazing, in particular for the production of wool and lambs for the domestic market.

In addition to dryland grazing, some smaller intensive agriculture is appearing in the immediate region.

These operations are usually characterised as being located on smaller allotments, where large-scale grazing for wool or lamb production would be unviable. Two protea (flower) farms exist some distance to the north of the proposed development and service the domestic market. Areas to the west, east and south have been planted with vines. The internationally regarded wine region of Margaret River is some 15km to the south.

5.3.3 Other Industry

A sand extraction operation operated immediately east to the property from 2001 to 31 March 2017. The site is currently undergoing rehabilitation to agricultural land. The view of land undergoing rehabilitation is shown in Figure 9. An application to extend the life of this project and extract sand to the boundary of Lot 75 Haag Road, Yelverton (in variance to the City's Local Planning Policy No. 5A – Provision 4.2.3.5) was decided at SAT Directions Hearing on 'Credaro & Ors v City of Busselton'.

5.3.4 Transport and Infrastructure

Road Infrastructure

The site has been laid out to accommodate a very low level of site presence and is in fact completely visually screened from all public roads in order to minimise the development on all adjacent land users.

Access to the site is provided by Haag Road which was upgraded by the pit operator at a cost to the property owner of \$178,000. Haag Road discharges onto Chambers Road which has been used for in excess of 15 years by the owners of Lot 4079 Chambers Road, Yelverton to deliver sand into the local civil and construction markets. Main Roads Western Australia (MRWA) has confirmed that the access point onto Bussell Highway is suitable for the proposed haulage activities.

Haag Road is the only access to the site and comprises of a 11.2 metre wide gravel road in good condition, upgraded by the property owner to City and MRWA standards, situated within a 20m road easement. The road reserve is heavily vegetated for the majority of its existing length and predominantly services several local properties and largely caters for light vehicles.

Haag Road joins Chambers Road, approximately 900m from the current entrance to the property. The most direct route along Chambers Road to Bussell Highway is sealed, due to contributions from the adjacent sand mining operation. The sealed section of Chambers Road is maintained by the City. The remainder of Chamber Road services local residences and farming operations and is unsealed with road maintenance of this unsealed section is undertaken by the City.

Bussell Highway is the key main road from Busselton to Margaret River and further down the south west. Bussell Highway falls under the jurisdiction of Main Roads WA and caters for significant traffic flows daily, including light and heavy vehicle traffic.

The access point where Chambers Road intersects Bussell Highway formed part of the MRWA Vasse-Dunsborough Bypass Upgrade project. Furthermore, the City has granted a development approval (DA09/0252) for the sand extraction from Lot 2 Haag Road, Yelverton using the identical collisions during the sand extraction of Development Approval DA12/0388 as the pit operator has strictly adhered to low speeds along Haag and Chambers Roads. Refer to attachment 1 for the overview of the site layout, local Haul routes and key features of the local area.

Truck Movements

The project is expected to generate on average 12 truck movements a day, based on estimated extractable volumes of 250,000 cubic metres of fill, restricted hours of operation, a truck and dog haulage configuration and a three year project life, although it is noted that demand may increase or decrease this total on any given day. Trucks are known to increase the wear and tear on road surfaces, particularly on narrower roads, where shoulder damage is generally the principle mechanism of road deterioration. The property owner privately funded a \$178,000 capital works upgrade to Haag Road, Yelverton prior to commencement of sand extraction, in accord with DA12/0338, which has been maintained in good working order by the pit operator.

Infrastructure Services

A power transmission line terminates on the western boundary line which is not situated near the project cells or haulage route.

The section of Chambers Road to be utilised to reach the Bussell Highway was upgraded for the adjacent sand extraction operation within the last five years and is considered to be highly suited for this application. Road wear and tear within the City is minimised by selection of a site that minimises transport on the local road network. A commitment to maintain the quality of Chambers Road by implementing an ongoing maintenance program will ensure that the road does not deteriorate over the life cycle of the project.

The route selected and the restrictions imposed on operating hours, in particular avoiding school bus hours, ensures that the risk of collision with school buses is eliminated and the risk of collision with local traffic is minimised. Road signage, suitable for the adjacent sand extraction operation, is considered appropriate for this project and no additional signage is proposed for traffic management purposes.

5.4 Complaints

A complaints recording and investigation procedure is to be implemented and maintained.

All complaints will be recorded, investigated and if substantiated action taken to correct the issue raised. Where possible the complainant will be contacted to explain the procedures and actions taken to resolve the issue.

6.0 RISK ASSESSMENT METHODOLOGY

This section outlines the methodology used in Section 7 to assess the impacts and risks of the proposal.

6.1 Identifying Impacts

It is recognised that the proposal will result in a series of unavoidable, or certain, environmental impacts. Most human activities result in some form of environmental impact, and routine impacts expected from the extraction of sand have been identified and captured by the proponent.

6.2 Identifying Risks

During most primary industry operations there remains the potential for unforeseen events to impact on operations, resulting then in the potential for unexpected impacts to occur. Past experience with extractive industries and use of the hazard identification (HAZID) processes outlined, non-routine activities that can occur can be identified to a high degree, and the impacts that could arise from these non-routine activities can be identified to a high degree. For this Social Impact Assessment, an “impact” is therefore a known result that will stem from routine sand extraction operations.

6.3 Ranking Identified Impacts and Risks

To rank risks a tailored risk assessment matrix was used and qualitative assessments made to determine the level of risk. For ranking impacts, the impact was assessed against the consequence descriptors. This allows qualitative outcomes of risks and impacts to be presented to assess whether an impact or a risk represents a negligible, low, medium, or high environmental threat ranking. The impact and risk assessment matrix is represented in Figure 10.

Consequence / Likelihood		Highly Unlikely	Very Unlikely	Unlikely	Likely	Highly Likely
High	Impact requires external assistance. Regional concern raised.	Low	Moderate	Moderate	High	High
Moderate	Local concern. Impact obvious offsite. Local area concern.	Low	Low	Moderate	Moderate	High
Low	Minor offsite impact may be noticeable, however only a low level of local concern expected.	Negligible	Low	Low	Moderate	Moderate
Negligible	Difficult to measure an environmental impact. Site concern only. Easily remedied.	Negligible	Negligible	Low	Low	Low

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Initially, risks and impacts are addressed with standard mitigation or control measures considered effectively implemented. If a resultant threat is still considered too high, for instance where a particular environment is susceptible to certain impacts over and above the majority of locations where extractive industries are undertaken, there may be the need to consider further impact or risk mitigation. Where a threat is calculated as moderate, practicable mitigation measures have been implemented to reduce the threat posed to as low as reasonably practical (ALARP). Where a threat returns a high rating, measures must be put in place to reduce this below high and to ALARP, or the activity avoided within the scope. Where a threat has been assessed as negligible, low, or ALARP, it is considered acceptable.

7.0 ENVIRONMENTAL IMPACT AND MANAGEMENT OF THE PROPOSAL

The following Section details the outcomes of the risk assessment undertaken in accordance with Section 6. Unless indicated otherwise, only those risks and impacts resulting in negative outcomes, and the mitigation measures to be implemented to minimise these impacts, are included in this Section.

7.1 Flora, Fauna and Biodiversity

- Harewood G, 2019, Targeted Fauna Assessment, Lot 75 Haag Road Yelverton.
- Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. *Lot 75 Haag Road, Yelverton*.
- Landform Research 2020, Proposed Sand Excavation, Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton.

7.1.1 Flora and Vegetation

It is proposed to extract the sand in three stages of three stages of 2.0, 2.0 and 1.0 hectares, to a depth of 0.5 metres separation above the highest winter water table.

The Clearing, vegetation management, closure and revegetation are considered in the Closure and Rehabilitation Plan which will be conditions within Clearing Permit CPS 8863/1 as it has been approved by DWER.

That vegetation management includes the addition of Conservation Covenants. See Figure 12.

The proposal will result in the removal of vegetation with the quality of this vegetation being poor/degraded, discussed in Section 3.1.6. *Phytophthora cinnamomic* (dieback) is not present on the proposed site. A phytophthora management plan has been previously submitted and approved by the City under DA12/0338 as the proposed project footprint is completely contained with the previously Council approved project footprint in DA12/0338.

The project will result in the rehabilitation of all project areas, either resulting in an area of diverse vegetation being protected from all but minor development that does not jeopardise the ecological value of the block, or the connection of this same block via a dieback hardy native vegetation belt to remnant vegetation to the north of the property. The rehabilitation methodologies include mulching of remnant vegetation for reuse, collection of hollow logs for early habitat generation and maintenance of topsoil for reuse. It is noted that species showing resistance to dieback, in particular the peppermint, would be likely to form a significant proportion of replanted vegetation, which may assist to increase the local habitat of fauna such as the Western Ringtail Possum.

Table 5: Impact and Risk Management to Flora and Vegetation

Aspect	Impact	Base Impact	Management Measures	Resultant Impacts
Clearing of vegetation within development footprint	Decrease in vegetation and habitat	Moderate	Rehabilitation of the site in accordance with Clearing Permit CPS 8863 and DWER approved Closure and	Low to Positive

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Aspect	Impact	Base Impact	Management Measures	Resultant Impacts
	Decrease in local biodiversity Loss of locally significant species		Rehabilitation Plan, to achieve the a net gain of native vegetation through either a strategic linking corridor or covenanting significance	
Rehabilitation with die-back hardy species	Provide higher vegetation quality than existing in the medium to long term	Positive	Dieback management of the site in accordance with Clearing Permit CPS 8863 and DWER approved Closure and Rehabilitation Plan	Positive
Vegetation covenant for long term protection of key areas	Provide long term vegetation protection within the City	Positive	Covenant in accordance with Clearing Permit CPS 8863 and DWER approved Closure and Rehabilitation Plan.	Positive
Dieback spread through vehicle hygiene failure	Spread of dieback to uninfected areas, particularly road verges	Moderate	Implement the hygiene regime and DWER approved Closure and Rehabilitation Plan,	Low
Dieback spread through failure to notify recipient of the presence of the pathogen	Spread of dieback to uninfected areas	Moderate	Implement the hygiene regime and DWER approved Closure and Rehabilitation Plan	Low
Removal of areas of remnant vegetation not within footprint	Loss of additional vegetation outside the project area (potentially of higher quality)	Moderate	No areas outside the approved excavation footprint will be permitted to be disturbed by CPS 8863. The vegetation outside the vegetation area will be protected, enhanced and better protected.	Negligible

7.2 Noise

Offsite noise is governed by the *Environmental Protection (Noise) Regulations 1997*.

The Environmental Protection (Noise) Regulations 1997, require that sensitive premises including dwellings in non industrial and rural areas, are not subjected to general noise levels (excluding blasting), during the hours 7.00 am to 7.00 pm Monday to Saturday that exceed 45 dBA. Allowable noise to 55 dBA is permitted for up to 10% of the time and to 65 dBA for 1% of the time. Noise levels are not to exceed 65 dBA during normal working hours.

Between 9.00 am and 7.00 pm on Sundays and Public Holidays, and between 7.00 pm and 10.00 pm on all days, the base level is 40 dBA.

At night, between 10.00 pm and 7.00 am Mondays to Saturday, and before 9.00 am on Sundays and Public Holidays the permitted level drops to 35 dBA.

The 10% and 1% “time above” allowances apply at night and on Sundays and Public Holidays as well.

There are penalties for tonality of 5 dB, modulation 5 dB and 10 dB for impulsiveness, that are added to the permitted levels. That is, if the noise is tonal or modulated the permitted levels drop by 5 dB. Impulsiveness is not likely to be relevant for the quarry under normal circumstances.

The Noise Regulations provide for Construction Noise exemptions to enable construction of the site such as the building of the screening bund and opening the pits.

Influencing factors that raise the allowable noise levels are activities such as external industrial noise, some nearby land uses and busy roads. These are not relevant to this site.

Under Schedule 1 of the Noise Regulations the premises on which the extraction of basic raw materials are extracted, is classified as Industrial Land for the purposes of calculating influencing factors. This was defined as the whole cadastral boundaries in State Administrative Tribunal decision {2013} WASAT 139, Bushbeach v City of Mandurah. In this case the premises is quite small and approximates the area of disturbance and will have little impact on the influencing factors.

At a distance greater than 15 metres from the sensitive premises (eg dwelling), and commercial premises, a base level of 60 dBA applies at all times, with the 10% time permitted to be up to 75 dBA and the 1% permitted to be up to 80 dBA. For industrial premises the base level is 65 dBA at all times with the 10% time permitted to be up to 80 dBA and the 1% permitted to be up to 90 dBA.

Excavation will be worked from inside out on the floor of the pit working below natural ground level with a perimeter low bund of topsoil stored to be respread at closure.

Based on the nature of the sand, equipment used and excavation methods, the extraction of sand has the lowest impact and even the generic buffer of 300 metres is too large for noise mitigation based on the proximity of dwellings to sand pits in the Perth and Peel Regions and in other parts of the State.

There are no residential properties near the existing excavation areas, with over 500 metres separation to all sensitive premises.

Noise is recognised as a sensitive impact in the rural setting, particularly within proximity to areas of high scenic attraction close to several key population centres, where a shift to rural lifestyle blocks is evident. Key issues relate to disturbance of sleep and interruption during the evenings or other times when people are enjoying the rural aspect, generally weekends. Other sensitive land uses include tourist accommodation or attractions.

For resident and tourist accommodation, times where noise becomes a particularly sensitive issue are generally before 7am, when people are still asleep or preparing for the day, around dusk (or after 6pm during summer hours) when people are unwinding from a day at work or enjoying an evening meal, or on the weekends. No excavation is proposed for Saturdays, Sundays or Public Holidays.

Consultation with adjacent neighbours and the operator of the sand mine adjacent to the project indicates that there was a general perception held by neighbours that noise from the operation would significantly impact their lifestyle, whilst in practice, although some nearby neighbours could hear earthmoving equipment and trucks, the impacts were restricted to times when the noise is a part of the rural lifestyle and comparable to the operation of agricultural machinery. Generally, whilst people would prefer that there were no sources of machinery noise in their immediate vicinity, it was recognised that a sand mining operation with an appropriate buffer zone and restricted to daylight hours Monday to Friday, caused little additional impact within the rural acoustic environment.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Operation machinery will be the main source of noise from the project, both earthmoving equipment (excavators and loaders) and haulage trucks. Earthmoving equipment is restricted to the site, whilst trucks will traverse private property and local roads to the highway. No significant issues have been raised in relation to noise from haulage on either private property or Chambers Road. Vehicle Noise on public roads is exempt from the Noise Regulations.

Vibration is an issue often associated with mining operations, however is unlikely to be noticeable outside the property boundaries. No blasting is required for sand extraction operations and vibration has not been considered further.

The project will be screened from the nearest adjacent residences by the substantive planting along Haag Road on the northern border of the property, shown in Figure 4. This will aid in reducing offsite noise impacts, acting as an acoustic barrier.

It is proposed that the operation hours of the project be restricted to 7am – 6pm Monday to Friday or daylight hours where these are more restrictive (i.e. during winter). The assessment of impacts has been based on this assumption.

Based on the nature of the sand, equipment used and excavation methods, the extraction of sand has the lowest impact and even the generic buffer of 300 metres is too large for noise mitigation based on the proximity of dwellings to sand pits in the Perth and Peel Regions and in other parts of the State.

The management of occupational noise is normally handled by providing all necessary hearing protection, as well as conducting worker inductions and educational programs for all staff, and hearing tests which are required. Regular site audits of quarry and mining operations are normally conducted by the Department of Mines Industry Regulation and Safety.

Aspect	Impact	Base Impact	Management Measures	Resultant Impact
Timing	Adverse noise on neighbours		No excavation is proposed for Saturdays, Sundays or Public Holidays. There are no residential properties near the existing excavation areas, with over 400 metres separation to all sensitive premises with the operations conducted on the floor of the pit to use the pit walls to screed the mobile plant.	
Operation of heavy earthmoving equipment	Additional noise at nearest residences	Moderate	Mufflers in good working order fitted on all equipment Mufflers routinely checked. Buffer along Haag Road maintained. Restricted working hours. Shutdown will be used to save fuel and maintenance costs in addition to noise minimisation.	Low

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

			There is good flexibility to plan the equipment use to reduce noise levels further even though that is not necessary for compliance with the Noise Regulations. This can include the location of the plant, number and type of plant operating at any one time, use of bunding or shielding, changing the mobile plant, providing better silencing etc.	
Truck transport past adjoining residents (Haag Road option)	Additional noise at nearest residences	Moderate	Transport along Haag Road at slow speed. No use of compression brakes.	Negligible
Reversing beepers (statutory requirement)	Unnatural, but intermittent, noise within the rural landscape	Low	Use either flashing lights or low frequency beepers. No high pitched reversing beepers will be used.	Low
Defective mufflers on operation machinery	Louder than usual noise emitted from equipment, increasing noise at adjacent residences	Low	Vehicles identified as having defective mufflers will not be used or permitted on site until the problem is rectified Routine maintenance of all earthmoving equipment undertaken	Negligible

The key risks identified are due to general operation of equipment, however a combination of existing buffers (inclusive of vegetation screens), well maintained equipment and restricted working hours will minimise any impact to adjacent residences. Consultation outcomes suggest that noise impacts will be of low severity if activities are conducted in accordance with these mitigation measures.

The Responsibilities for Noise Management are shown in the Operations Environmental Management Plan Section 3.11.

7.3 Air Emissions - Dust

Extractive industries have the potential to cause an impact on local air quality.

Dust risk is restricted to the fine grey dust in the topsoils which can blow when it is disturbed. Sand grains are too large to become airborne. The other potential source of dust is dust generated by vehicles driving along the access road. For much of the year the soils remain moist, even in summer with the small amounts of rain and capillary action. Therefore dust risk is generally not an issue with local sand quarries. Clearing and land reinstatement will be carried out when the soils are moist.

The key impact is generally dust, which causes amenity impacts (dust on washing or on furniture etc) and can cause health impacts through exposure (inhalation) aggravating the respiratory system.

Prior to the imposition by regulation of stringent environmental controls and the availability of knowledge within the industry for controlling the root causes of impacts, quarries were notorious for generating dust and other air emissions and were often inappropriately sited, being placed near numerous sensitive land uses (within rural suburbs or adjacent to schools etc). With good planning and siting in an appropriate location, quarries now minimise impacts on local air quality.

The dust risk assessment is based on the DEC (DWER) 2011 Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and other Related Activities.

DEC (DWER) 2011 Guidelines provide for dust risk assessments to be conducted, management proposed and implemented and a visual monitoring procedure and complaints mechanism to be used.

The Guidelines are for uncontrolled sites or for sites to determine what management of dust might be necessary. Therefore two scores have been used in the risk assessment.

From the assessment of the setbacks of the proposed operations and prevailing winds, the main risk is from the easterly winds on mornings, especially in summer when the soils, hardstand and stockpiles are at their driest.

Tree Belts and Buffer Management

The distance to sensitive premises are > 0.5 km for all but the dwelling to the east south east which lies at approximately 400 meters from the corner of the pit, separated by remnant vegetation which will remain in place.

The EPA guidance "*Separation Distances between Industrial and Sensitive Land Uses*", June 2005, lists the generic buffers for quarries with crushing processing and milling on a case by case basis with the guideline for sand and limestone excavation generic buffer as 300 – 500 metres depending on the extent of processing.

Sand extraction has the smallest buffers with many sand extraction sites at 300 metres or less throughout the south west. The buffers also comply with the *City of Busselton Local Planning Policy No. 2.3 Extractive Industries* and the Draft *DWER Guideline for Dust Emissions 2021*. See Table 2 for the buffer distances.

The buffer distances also comply with the setbacks prescribed by the Department of Natural Resources Queensland (1997) *Planning Guidelines: separating agricultural and residential land uses* and *Department of Health WA, 2012* which used the same guidelines.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Dust particles are readily stopped by tree belts and distance, with which the site complies. Tree belts slow the wind and allow the dust to settle but on this site it is the travel distances that provide the protection.

The Queensland Guidelines predominantly relate to agricultural spray drift, but based on particle size also relates to dust.

The Guidelines provide for a buffer of 300 metres for open agricultural land, which is applicable to the proposed operations, dropping down to 40 metres where an effective tree belt is in place. The Western Australian Department of Health also uses the same guidelines. The Guidelines are based on field studies and demonstrate the effectiveness of tree belts and distance in providing screening against particulate travel.

On this site it is noted that the distance to the closest sensitive premises is a minimum of around 400 metres along relatively flat ground. That land surface has significant vegetation and trees minimising any dust risk to sensitive premises.

The vegetation between the corner of the proposed pit and the dwelling to the east will provide good protection from dust risk as considered in the Department of Health and DWER Guidelines.

Table 6: Dust Risk (DWER 2011 Guidelines)

PART A Number	Item	Score
		Sand excavation on the proposed sand pit
1	Nuisance potential of the material	Low when trafficked and untreated and topsoil is moved when moist - 2.
2	Topography and vegetation screening	Sheltered and screened - 1
3	Area of site activities	Active trafficked areas at any one time are 1 - 5 hectares in area - 3
4	Type of work being undertaken	Bulk earthworks - 9
	Summer total without dust measures	Maximum = 6

PART B Number	Item	Score
		Sand excavation on the current sand pits and resources.
1	Distance to premises	Premises between 100 - 500 metres – 12
2	Effect of prevailing wind	Isolated land uses affected by one wind direction - 6
	Total Part B	Maximum Premises = 18

Activity	Calculated Score Part A x Part B	Allocated Risk of Dust
----------	-------------------------------------	------------------------

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Sand excavation on the current sand pits and resources.	Maximum Premises A and B = 6 x 18= 108	Classification 1 Negligible Risk, No recommended actions or contingencies required for the dwellings. Dust management will be required for pit best practice and worker environment.
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The dust risk assessment based on the *DEC (DWER) 2011* shows a “Negligible” Risk.

Impacts, risks and management measures to minimise the effect on local air quality are detailed in Table 9.

Table 9 Impacts, Risk and Management- Air Emissions

Aspect	Impact	Base Impact	Management Measures	Resultant Impacts
Land clearing	Potential dust from dry topsoil.	May travel offsite. Low	Clearing land reinstatement will be carried out when the soils are moist.	Negligible
Emissions from vehicles and operating machinery (particularly diesel engines)	Increase in particulates in local air environment	Low	Keep exhausts in good working order through routine maintenance	Negligible
Greenhouse emissions from burning fossil fuels	Increase in greenhouse concentrations in the atmosphere	Low	Minimise material handling in accordance with good quarry planning, to minimise fuel use. Use appropriately sized machinery.	Negligible
Excavation	Potential dust from dry topsoil	Low	The excavation of sand is free from dust as the particle sizes are too large and the sand stays moist from capillary action. Excavation will be undertaken as low in the pit as permitted by the quarry planning to provide maximum shelter for dust protection and behind the perimeter bund and face. Trafficked roads and hard stand will be wetted down or treated if required. Internal roads and hardstand surfaces will be maintained in good condition (free of potholes, rills and product spillages) and with	

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Aspect	Impact	Base Impact	Management Measures	Resultant Impacts
			suitable grades	
Dust generated by haulage	Increase in particulate in the atmosphere, deposition on surrounding residences, health effects of dust	Low	Water to be applied to haul roads as required to minimise dust. Unsealed section of haul route separate from residences by >700m. All vehicle loads will be covered.	Low
Dust generated by a combination and high winds	Increase in particulate in the atmosphere, deposition on surrounding residences/ health effects of dust Large dust loads Visible dust blow	Moderate	Extraction to be staged Minimise work in strong winds, such that dust generated from loading activities is minimised Progressive rehabilitation to be conducted Long term stockpiles to be stabilised using dust suppressing measures (jute matting, grass, etc.)	Low

The key impacts identified was the risk of dust blow from severe wind, coupled with dry weather. This risk will require active management, the key step being to minimise the area of exposed soil through working only two hectares at any one time, securing long term stockpiles, progressively rehabilitating worked areas and minimising works if winds are high and material is very dry. All routine impacts from dust to other air emissions were considered negligible, given buffer distances and the scale of the activity being proposed.

The Responsibilities for Dust Management are shown in the Operations Environmental Management Plan Section 3.11.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

7.4 Ground and Surface Water

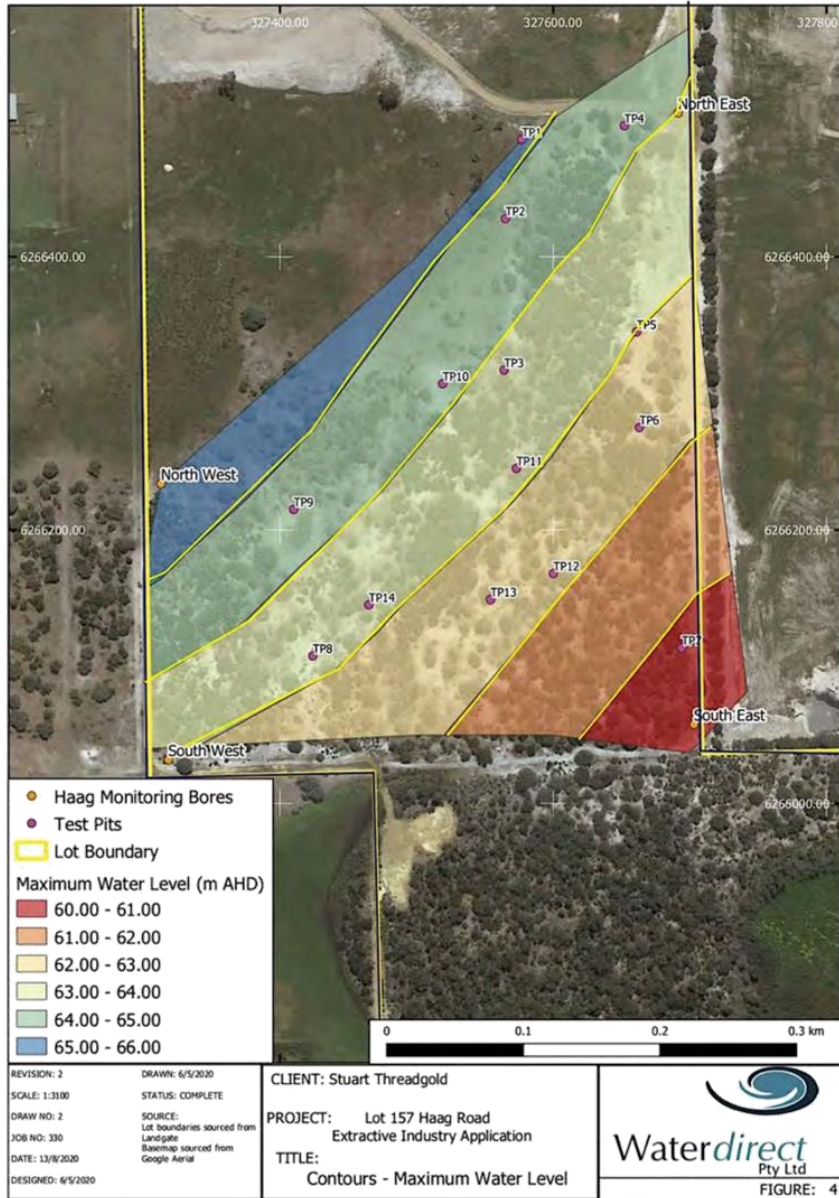


Figure 13: Water table elevations

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

Extraction operations have the potential to create sediment laden runoff, particularly as often large work areas are left disturbed at any one time. Sand extraction activities should be less prone to sediment runoff, given that unlike clays, sands should only be transported in only the most high energy runoff flows.

Two watercourses run in proximity to the project areas, namely Mary and Annie Brook. These watercourses are heavily vegetated and are likely to have a high capacity for absorbing sediment runoff with a large particle size (i.e. sand), however the aim should be to minimise sediment load. The two watercourses are located within the Vasse-Wonnerup wetland system, however it is considered that the buffers from watercourses, coupled with the type of material being extracted or disturbed, will present no threat to this system.

The groundwater system in the area has been investigated by Water Direct Pty Ltd, August 2020 V2, Hydrogeological Assessment Extractive Industries Approval, for S and C Threadgold, 157 Haag Road Yelverton.

Some general groundwater protection measures are required to protect against the risk of contamination so as to protect any beneficial uses in proximity to the project.

Chemical or fuel spills soaking through to the groundwater is the main cause of groundwater contamination, usually via unidentified leaks in long term fuel storage tanks. In addition, spills of hydrocarbons can be transported by stormwater into local watercourses, which can result in visible sheens of hydrocarbons and impacting aquatic life. Frogs in particular are susceptible to this type of pollution.

Table 7: Water table risk and management

Aspect	Impact	Base Impact	Management Measures	Resultant Impacts
Sediment running off from the site during heavy rainfall	Turbidity in local waterways Deposition over aquatic organisms	Low	Buffer of ~ 100m to be maintained between working areas and watercourses	Low
Risk	Potential Impact	Base Risk	Management Measures	Resultant Risk
Maintenance activities spilling oil or other hydrocarbons to ground	Contamination of waterways	Low	Equipment to be maintained in a designated equipment yard. Drip trays and spill clean-up kits to be kept on site and employed if a spill occurs.	Negligible
Leaking fuel tanks transmitting fuels to groundwater systems	Contamination of groundwater with hydrocarbons	Moderate	Bunds placed around all permanent fuel tanks or chemical storages	Low

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

The key risk identified in analysis is presented by permanent chemical and fuel storage on site. Bunding, coupled with routine checking of the tanks, will ensure this risk is minimised. Bunds will be designed to ensure any realistic spill scenario is captured by the bund.

Table 8: Hydrology and Pit Floor Management

HYDROLOGY – WATER AND PIT FLOOR MANAGEMENT	Compliance and Monitoring	Remediation	Timing
<p>Groundwater Flows – Floor Elevation The water table has been monitored from 2018 to 2020 and that data has been used to inform the hydrogeological report prepared by Water Direct Pty Ltd who used regional bore elevations to determine the winter maximum water table elevation. The excavated floor is to be a minimum of 0.5 metres separation to the highest seasonal water table based on Water Direct Figure 4 which takes into account the water monitoring from 2018 – 2020 as well as adding 0.2 metres to the measured AHD groundwater elevations to bring them into line with the historical groundwater elevations recorded by DWER Monitoring Bores. The proposed final floor elevation of the pit is designed by being 0.5 metres above the winter maximum water table elevation. The floor elevation maintains the pre-mine water table gradients from north west towards the south east. No surface flows of water are anticipated on the pit floor because like the current land surface of deep sand the sand on the floor of the pit will be too permeable to allow surface water flow. Currently there is no surface water flow from Lot 75 and the proposed pit quarry. That situation will be maintained. The lowest point of the pit will be the south eastern corner and with the batter slopes of the pit there will be no surface flows of water out of the pit. The catchment and water flow paths and volumes will not change as a result of the excavation. The groundwater from under the pit will continue to flow south east, away from the catchment of Annie Brook. Recharge from the removal of some trees and shrubs will lead to a small increase in recharge to the water table which will compensate for a drying climate. That is, there will be no changes to the water regimes and inflows to either Mary or Annie Brooks.</p> <p>Water Quality The operational Management proposed for the excavation includes management and removal of wastes and refuelling and servicing management. No fuel will be stored in the pit and all major servicing will be completed offsite.</p>	<p>The concept pit floor is 0.5 metres above the maximum winter ground water 2018 to 2020 plus 0.2 metres. (Water Direct Figure 4). Five water monitoring bores are installed at each corner of the proposed pit, NW, NE, SE and SW as well as the central south. Water monitoring has been completed through 2018 to 2020. The monitoring bores will be monitored in Autumn and late winter annually. At least one piezometer will be installed on the floor of each stage of the extraction to monitor the 0.5 separation to the winter water table.</p>	<p>If the water table is exposed on the floor of the pit the depression will be backfilled to comply with the 0.5 metre separation from the final land surface. If the highest winter water table is found to be different to the hydrogeological data the floor elevation of future stages will be adjusted up or down to compensate.</p>	<p>Autumn and late Winter during the life of the excavations.</p>

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – Version 2

The Responsibilities for Water Management are shown in the Operations Environmental Management Plan Section 3.1.3.

7.5 Transport and Infrastructure

Trucks are known to increase the wear and tear on road surfaces, particularly on narrower roads, where shoulder damage is generally the principle mechanism of road deterioration.

The property owner privately funded a \$178,000 capital works upgrade to Haag Road, Yelverton prior to commencement of sand extraction, in accord with DA12/0338, which has been maintained in good working order by the pit operator.

Table 9: Transport Risks and Management

Aspect	Impact	Base Impact	Management Measures	Resultant Risk
Haulage trucks damaging the pavement of Chambers Road	Damage to pavement and increased risk to local traffic	Moderate	Pavement to be promptly repaired where damage solely attributed to the project is evident	Negligible
Risk	Potential Impact	Base Risk	Management Measures	Resultant Risk
Risk of collision with public traffic	Injury/damage to property	Low	Restrict hours of haulage to daylight hours No haulage to be conducted on Chambers Road during school bus hours Road damage to be promptly repaired	Low

The section of Chambers Road to be utilised to reach the Bussell Highway was upgraded for the adjacent sand extraction operation within the last five years and is considered to be highly suited for this application. Road wear and tear within the City is minimised by selection of a site that minimises transport on the local road network.

A commitment to maintain the quality of Chambers Road by implementing an ongoing maintenance program will ensure that the road does not deteriorate over the life cycle of the project.

The route selected and the restrictions imposed on operating hours, in particular avoiding school bus hours, ensures that the risk of collision with school buses is eliminated and the risk of collision with local traffic is minimised. Road signage, suitable for the adjacent sand extraction operation, is considered appropriate for this project and no additional signage is proposed for traffic management purposes.

Development Application (Sand Extraction) - Social Impact Assessment
Lot 75 Haag Road, Yelverton – **Version 2**

The Responsibilities for Transport Management are shown in the Operations Environmental Management Plan Section 3.1.2.

7.6 Visual Amenity

In an area generally regarded as having a high visual amenity, quarries would be considered out of place or detrimental to this amenity. This project is not visible from any vantage points in surrounding areas and is not marked in the Caves Road Visual Management Policy as an area requiring additional scrutiny from a visual amenity perspective. The site is effectively screened from Haag and Chambers Roads, by dense and tall native vegetation along the road reserve, general topography, mature northern peppermint tree line on-site, blue gum rehabilitation along eastern boundary and pinus pinea along western boundary.

Table 10: Visual risk and management

Aspect	Impact	Base Impact	Management Measures	Resultant Impact
Quarry visible from a limited number of vantage points	Visual incompatibility of sand extraction operation in the rural environment	Negligible	Maintain buffers Use internal roads to Chambers Road Minimise dust emissions Progressive rehabilitation undertaken	Negligible
Risk	Potential Impact	Base Risk	Management Measures	Resultant Risk
Land use changes require the removal of buffer vegetation along Haag Road	Increase in visibility of the site from Haag Road	Low	Consult with City to ensure buffers are maintained or advance notice is given of removal so alternatives can be considered	Negligible
Visibility of the project from Haag Road	Deterioration in the aesthetic appeal of the adjacent eco-retreat	Low	Maintain the effective buffering Plan works to ensure the most northerly blocks are worked in a manner sensitive to this issue (work the extraction face south to north, maintain buffers, stay off the ridgeline)	Low

The visual impact of the project is shown to be negligible, given that the site is effectively screened from all major vantage points identified as well as all adjacent roads, which are, in any event, servicing predominantly local traffic only. Buffers are to be maintained and rehabilitation progressed in parallel with extraction operations to ensure any impacts are further lessened.

7.7 Impact Assessment Summary

Impact assessment indicates that the site is excellently positioned close to major transport infrastructure, effectively screened from the majority of view sheds, adjacent residences and property and can operate in all cases with only a low impact on adjacent residents or land uses. In the short term, the proposal will result in an immediate decrease in native vegetation, but as this is heavily impacted with phytophthora and is deteriorating presently, implementation of either rehabilitation option should result in a net gain of native vegetation quality.

7.8 Framework Environmental Management Plan

An Environmental Management Plan is attached to address:

- project operations (hours of operation, site layouts, haulage routes, etc.)
- roles and responsibilities for implementation of the EMP
- documentation and record keeping
- environmental inductions, training and awareness

Site environmental management as detailed as in the application, including:

- Noise and Dust Management Plan
- Road monitoring and repair
- Drainage Management Plan
- Dieback Management Plan
- Maintenance of site buffering
- Rehabilitation
- Complaints and queries handling and response
- Environmental monitoring and reporting

Closure and Rehabilitation Plan

**PROPOSED SAND EXCAVATION
CLOSURE AND REHABILITATION PLAN**

S Threadgold

Lot 75 (157) Haag Road,
Yelverton

City of Busselton - DA2020/437

Clearing Permit – CPS8863/1

1 October 2021

SUMMARY

Sand has been excavated from Lot 75 (157) Haag Road, Yelverton previously.

This proposal is for a sand extraction quarry covering an area of approximately 5.0 hectares.

The proposed excavation is an amendment to an earlier application to the City of Busselton (DA2020/0437) and a Clearing Permit Department of Water and Environmental Regulation, (CPS 8863/1).

It is proposed to extract the sand in three stages of three stages of 2.0, 2.0 and 1.0 hectares, to a depth of 0.5 metres separation above the highest winter water table.

Flora, Vegetation and Fauna studies have concluded that the vegetation is in generally Degraded Condition.

An offset of around 10.1 hectares of vegetation in Good to Very Good Condition plus an additional 2.9 hectares of sand ridge vegetation is offered as an offset, under Conservation Covenant, in addition to the sand excavation being returned to *Banksia* Woodland.

This Rehabilitation Management Plan is written to support the revegetation of native vegetation around the floor of the pit as well as to support the revegetation of the site under the Development Approval and provide the information required by DWER in relation to the groundwater elevations and the final floor elevations.

The Report is provided in Two Parts;

- Part 1 – Existing Environment, which provides the background information and context
- Part 2 – Revegetation Plan to DWER Requirements



Landform Research

Rehabilitation Management - Proposed Sand Excavation, Lot 75 Haag Road, Yelverton

CONTENTS

1.0 INTRODUCTION	1
1.1 Background – Property Details	1
1.2 Work Brief	1
1.3 Project Overview	1
1.4 End Use	2
1.5 Baseline Assessments	2
1.6 Studies Completed	2
1.7 Legal Controls	3
2.0 PROPOSED EXCAVATION	6
2.1 Project Overview	6
2.2 Staging	7
3.0 EXISTING ENVIRONMENT	8
3.1 Current and Past Landuse – Site Description	8
3.2 Geology and Soils	8
3.3 Hydrogeology and Drainage	8
3.4 Flora and Vegetation	11
3.4.1 Vegetation Present	11
3.4.2 Significant Vegetation	13
3.4.3 Current Vegetation and Disturbance	17
3.5 Summary of the Vegetation to be cleared	18
3.6 Fauna	20
3.6.1 Conservation Covenants and Mitigation to Clearing	25
The proposed extraction area is reduced from 11.5 hectares to 5.01 hectares.....	25
4.0 CURRENT DISTURBANCES AND ENVIRONMENTAL THREATS	26
5.0 CLOSURE AND REVEGETATION	30
5.1 Introduction and Purpose	30
5.2 Final Landform of Excavation	30
5.3 Responsibilities	30
5.4 Current Disturbances and Environmental Threats	31
5.5 Completion Criteria	31
5.5.1 Completion Criteria of the Excavated Resource Area	31
5.5.2 Completion Criteria of the Southern Remnant Vegetation	32
5.5.3 Completion Criteria of the Old Gravel Pit	33
5.5.4 Completion Criteria of the Sand Ridge Conservation Area	33
5.6 Monitoring of Revegetation	33
6.0 CLOSURE AND REVEGETATION	34
Revegetation Management	42
7.0 MANAGED RISKS - REVEGETATION	55
8.0 WEED AND DIEBACK MANAGEMENT	17

Rehabilitation Management - Proposed Sand Excavation, Lot 75 Haag Road, Yelverton

8.1	Weed Management Plan	17
8.2	Dieback Management Plan	18
8.3	Suggested Species List for Revegetation.....	19

FIGURES

Figure 1:	Location of the sand resource (orange) - <i>Stream Environment and Water 2018</i>	3
Figure 2:	Proposed Excavation - Staging - Existing Contours. See Figure 16 for Section Line A - B	4
Figure 3:	Concept final contour plan	5
Figure 4:	Maximum groundwater elevations (m AHD).....	10
Figure 5:	Aerial photograph of the sand resource. See Figure 2	11
Figure 6:	Vegetation Complexes (<i>Stream Environment and Water 2018</i>).....	12
Figure 7:	Vegetation Communities (<i>Stream Environment and Water 2018</i>).....	15
Figure 8:	Aerial photograph of the offset land. Compare to Figures 5 and 7	16
Figure 9:	Vegetation Condition (<i>Stream Environment and Water 2018</i>).....	17
Figure 10:	Typical vegetation with a cluster of better overstorey in the distance.....	18
Figure 11:	Western and northern vegetation, generally outside the proposed resource area	19
Figure 12:	Typical vegetation. Significant deaths of <i>Banksia</i> and no understorey.....	19
Figure 13:	Typical vegetation. Degraded overstorey and no understorey	20
Figure 14:	Location of larger trees and trees with hollows (Harewood 2019).....	22
Figure 15:	Pit Footprint and Conservation Covenants	23
Figure 16:	Section Line (See Figure 2 for the location of the section).....	24

Rehabilitation Management - Proposed Sand Excavation, Lot 75 Haag Road, Yelverton

TABLES

Table 1: Hydrology and Pit Floor Management	9
Table 2: Summary of 100 m ² Sample Plots of the Best Vegetation on the Sand Resource	14
Table 3: Summary of 100 m ² Sample Plots of the Southern Remnant Vegetation.....	14
Table 4: Current and Baseline Potential Impacts on Vegetation	26
Table 5: Summary of the Rehabilitation Procedures	35
Table 6: Revegetation Management.....	42
Table 7: Risks Associated with Revegetation and Management.....	55
Table 8: Risk Assessment Criteria (After DMIRS)	58
Table 9: Species List for Revegetation	19

ATTACHMENTS

- Harewood G, 2019, Targeted Fauna Assessment, Lot 75 Haag Road Yelverton.
- Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. *Lot 75 Haag Road, Yelverton.*

1.0 INTRODUCTION

1.1 Background – Property Details

The history of Lot 75 is provided in the document Development Application (Sand Extraction) 2019 – Social Impact Assessment provided to the City of Busselton in support of the Application, Section 2.1.2. (See Attached).

A sand extraction quarry is applied for on Lot 75 (157) Haag Road, Yelverton by the landowner, covering an area of approximately 5.0 hectares. The sand pit is to operate over a 5 year period.

The property details are found in the Development Application submitted to the City of Busselton, which is attached and the Application for a Clearing Permit (CPS 8863/1).

The proposed extraction has been amended from the original 11.5 hectares down to 5.0 hectares.

The land is owned by S Threadgold who is the applicant for the proposed sand extraction (City of Busselton DA 2020/437) and Clearing Permit CPS 8863/1).

Both the Development Application and the Clearing Permit have been reduced to 5.01 hectares.

It is proposed to extract the sand in six stages of around 2.0 hectares each for stages 1 and 2 and 1.0 hectare for Stage 3.

The project will supply the local building and construction industry, Main Roads WA projects and civil works with an estimated 200,000 tonnes of quality grade building sand and fill material. The principal markets to be supplied with this depleting resource are Busselton, Vasse and Dunsborough areas which are still experiencing prolonged growth.

The project is sited close to major road infrastructure, located approximately two kilometres from Bussell Highway.

Sand has previously been extracted from the northern portion of Lot 75 through development approval from the City of Busselton (DA12/0338) and a previous Clearing Permit (CPS 765/1).

Plans of the amended Development area and proposed Clearing Permit Area are attached. The applied for area is found on the attached Figures 2 and 3 which show the staging.

The site is partially covered by native vegetation in generally Degraded Condition.

1.2 Work Brief

Landform Research was requested to review the submitted information and site studies and prepare a rehabilitation plan for the end use of the property and to provide input to both the amended Development Application and Clearing Permit.

A site inspection was made by Lindsay Stephens of Landform Research on 7 August 2020.

The contacts for Landform Research are listed at the front of the report under the Summary.

1.3 Project Overview

Lot 75 is currently used as a Lifestyle Lot with a dwelling. It has some cleared agricultural land that is lightly grazed, with the remainder of the northern portion of the land Parkland Cleared with pasture understorey. The native vegetation on the southern portion remains largely intact.

A constructed wetland exists at the northern end of the previously excavated land, and some trees planted such as *Pinus pinea* as a use of pine nuts. There is some natural vegetation, and an area of vegetation in Good Condition on the southern portion of the subject land

In the past, under a previous owner, Lot 75 was used as grazing and general agriculture and for sand extraction.

The capability of the sands for grazing has been improved by the past sand extraction, which lowered the sand ridge and enabled the sand to carry good pasture over into summer.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

The remaining sand ridge, which is covered by generally degraded remnant vegetation, has a sand resource with a surface up to 5 metres above the water table and does not support pasture into summer.

With the extraction of the sand the soils will be improved through better summer soil moisture.

A southern portion of Lot 75, extending into the south eastern corner, is covered by remnant local native vegetation with a wetland. That land of around 10.1 hectares will be offered as conservation through Conservation Covenant.

As part of that proposal Haag Road was significantly upgraded to the City of Busselton requirements. The adjoining property to the east has been the subject of sand extraction, and used the upgraded Haag Road.

1.4 End Use

After sand excavation, portion of the excavated land will be returned to local native vegetation.

The perimeter buffer vegetation will be retained.

The fire break will be relocated from the boundary to the floor of the excavated area to better protect the perimeter vegetation and land uses on Lot 75.

The southern area of vegetation in Good to Very Good Condition will be retained and placed under Conservation Covenant. A fire break will be provided to that vegetation as required by the City of Busselton. See Figure 15.

The old gravel pit in the proposed Conservation Area will be revegetated to local native vegetation.

1.5 Baseline Assessments

Within the previous reports and documentation a number of discussions and plans have been prepared to provide the background data for the proposed excavation of sand.

The various information was reviewed to check for inconsistencies or potential improvements.

When reviewing the available data no issues were found that would lead to any other significant changes to the project apart from the reduced excavation footprint.

A site survey plan was prepared on 7 August 2020 that was not available to the other consultant reports and is included here.

From the available information a closure and rehabilitation plan was developed.

1.6 Studies Completed

A number of studies have been completed with respect to the proposed extractive industry site.

- Harewood G, 2019, *Targeted Fauna Assessment, Lot 75 Haag Road Yelverton*.
- Landform Research, 2020, Field inspection. Observed material is included in this Revegetation Plan.
- Ngh Environmental 2018, *Noise and Dust Management Plan, Sand Extraction – Lot 75 Haag Road Yelverton*.
- Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. *Lot 75 Haag Road, Yelverton*.
- Survey South 2020, *Feature Survey and Contour Plan of Lot 75 Haag Road Yelverton*.
- Threadgold Architecture, 2019, *Development Application (Sand Extraction) – Social Impact Assessment, Lot 75 Haag Road*.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

- Threadgold Architecture, 2019, Operations *Environmental Management Plan – Sand Extraction, Yelverton*.
- Water Direct Pty Ltd, August 2020 V2, *Hydrogeological Assessment Extractive Industries Approval, for S and C Threadgold, 157 Haag Road Yelverton*.

1.7 Legal Controls

The quarry will be approved under a number of different processes.

The City of Busselton will condition all aspects of the quarry, including the methods of excavation, the depths of excavation, the final floor form, the revegetation and rehabilitation and the water quality management.

The City of Busselton will issue a Development Approval (DA 2020/0437) with Conditions under their Town Planning Scheme. They will also issue an Extractive Industry Licence under the City's Local Law, again with Conditions.

Monetary Bonds will be required by the City to ensure satisfactory compliance and rehabilitation. Those Bonds will be required to be legally available to the City in the event of default on the completion of the sand excavation and satisfactory rehabilitation.

If the landowner does not satisfactorily complete the revegetation the City will be able to undertake those activities using the money from the required bond under the Local Law.

In addition a Clearing Permit (CPS 8863/1) under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, will contain conditions that will also regulate the clearing and revegetation of the site.

If the sand is to be screened, a Licence under *Part (V) of the Environmental Protection Act 1986* will be required that will also be issued with conditions to regulate the operations of the quarry.

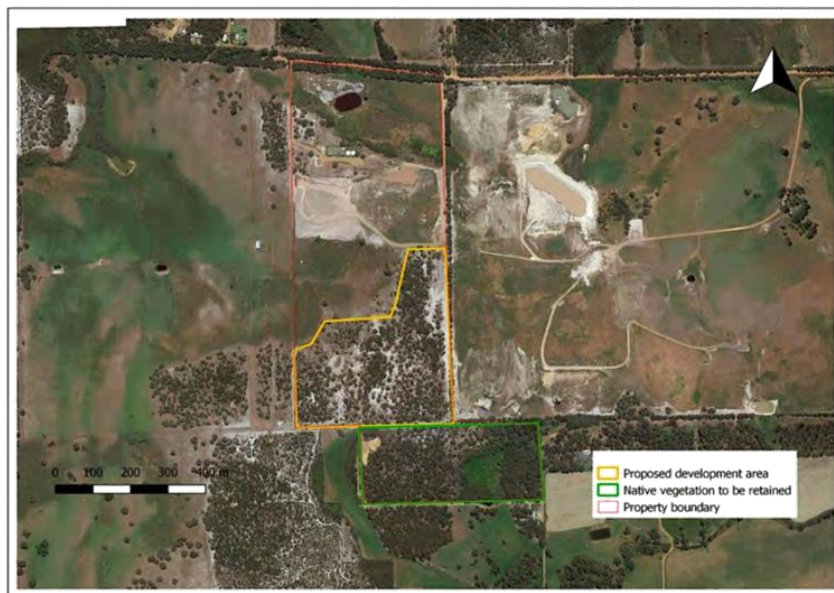


Figure 1: Location of the sand resource (orange) - *Stream Environment and Water 2018*

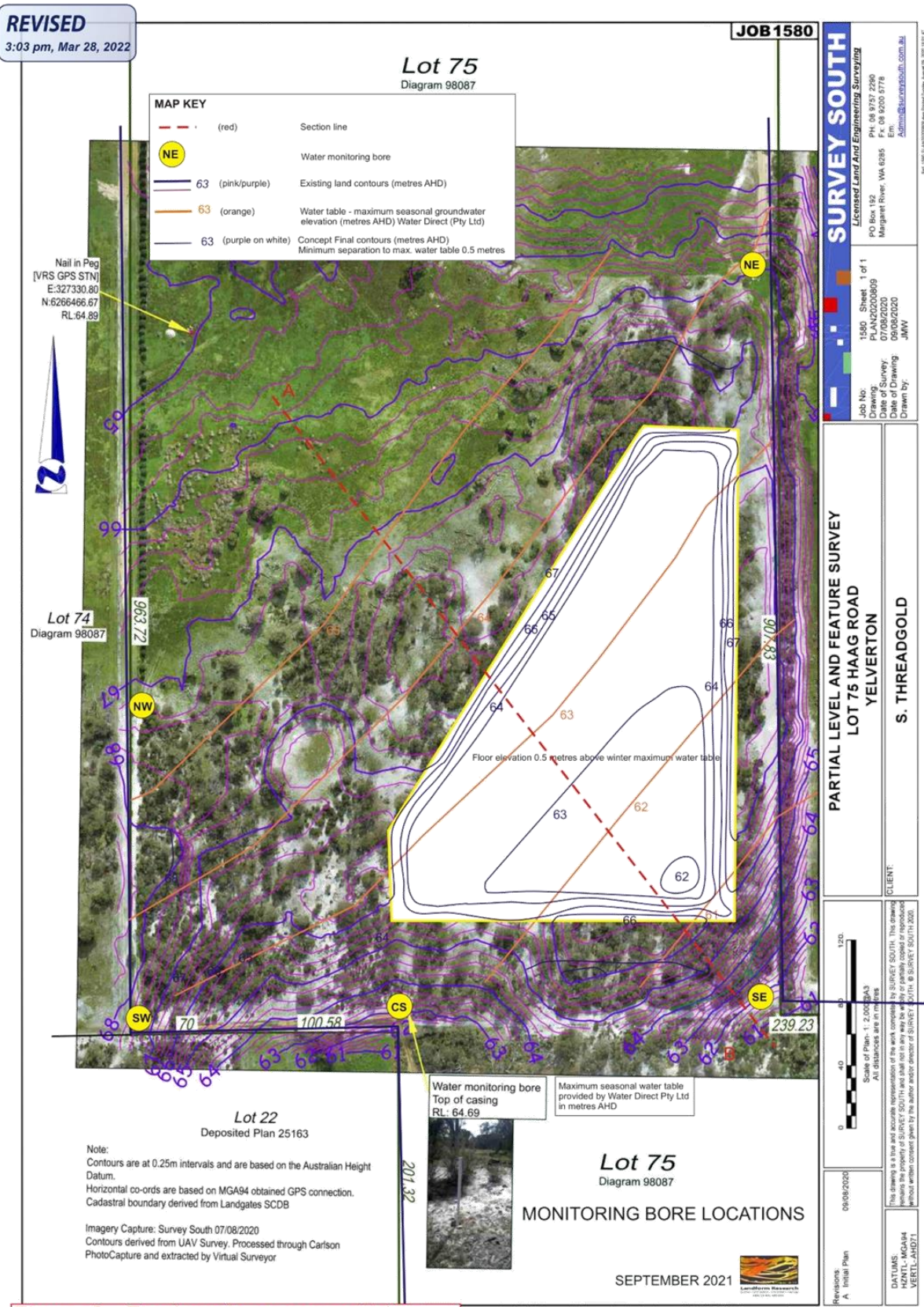


Figure 3 : Final contour concept plan

2.0 PROPOSED EXCAVATION

2.1 Project Overview

The Project Overview is provided in the Development Application (Sand Extraction) 2019 – Social Impact Assessment provided to the City of Busselton in support of the Application, Section 3.0. (See Attached).

The whole resource area has been investigated using an excavator digging test holes in a grid pattern. The sand varies from yellow to white and from 1 – 3 metres deep with an average of 1.5 metres. See Water Direct Pty Ltd. See Figure 2 and Figure 15.

- An access road will be formed from gravel or limestone to enable the various stages to be excavated.
- Vegetation will be cleared by pushing into perimeter stockpiles. Excess timber will be used for fence posts, fire wood, and craft uses, subject to site and use safety. See Section 4.2 Vegetation Recovery During Clearing.
- Smaller vegetation branches will be used in revegetation for a source of seed, by spreading on the batter slopes and rehabilitation areas.
- Excess vegetation will be mulched for final end use restoration.
- Topsoil will be removed and recovered for spreading directly onto areas to be revegetated.
- If topsoil cannot be directly transferred it will be stored in low dumps at the perimeter of the excavation footprint.
- There is little or no overburden, which will consist of subgrade sand. If available overburden will be pushed from the excavation area to provide perimeter bunding to assist in visual, noise and dust management.
- Sand will be excavated from the floor of the pit to a depth of 1 – 5 metres.
- The base of the pit is to be a minimum of 0.5 metres separation to the highest seasonal water table based on Water Direct Figure 4 which takes into account the water monitoring from 2018 – 2020 as well as adding 0.2 metres to the measured AHD groundwater elevations to bring them into line with the historical groundwater elevations recorded by DWER Monitoring Bores.
- As the first part of construction and excavation, the access road will be constructed at the pit final floor elevation by cutting to the floor of the pit. This will mitigate the need to construct the road twice. The access road will be formed from gravel, limestone or suitable hard stand to enable traffic.
- The sand to be used for fill will be loaded directly to road truck by loader. The loader will stay at the face and the road trucks will be restricted to access roads spreading out from the centre of the operational area. Drivers will be instructed to stay in their trucks within the loading area.
- The loader will work at the face, approaching the face in a perpendicular manner to enable the natural slump of sand to make the working face safe.
- Trucks will be confined to a haul road and loading area that will be moved as required as the face progresses. The trucks will approach in an anticlockwise direction so the driver is facing the loader. Drivers will be required to stay in their trucks whilst in the loading area.
- All vehicles will have radio contact.
- The site will be worked in stages with the land being reformed and rehabilitated progressively as the final floor elevations are reached.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

- The design depth of the excavation is based on winter water monitoring and will be maintained by survey and piezometers.
- Operations will occur on the floor of the pit with the face providing visual and noise screening to the closest residences as shown in the attached Staging Plan.
- Rehabilitation will progressively follow mining, wherever possible with completed stages of the excavation being revegetated as soon as practicable.

2.2 Staging

The pit is divided into three stages of 2 hectares + 2 hectares + 1 hectare.

The face of the pit will be orientated so that the face is located between the excavation area and Haag Road and the closest sensitive premises such as dwellings to the north east and north west and the dwelling and glamping to the south east. Figure 2

3.0 EXISTING ENVIRONMENT

3.1 Current and Past Landuse – Site Description

Lot 75 is currently used as a Lifestyle Lot with a dwelling. It has some cleared agricultural land that is lightly grazed, with the remainder of the northern portion of the land Parkland Cleared with pasture understorey. The native vegetation on the southern portion remains largely intact.

The land north of the sand resource was extracted for sand previously.

As part of that proposal Haag Road was significantly upgraded to the City of Busselton requirements.

The adjoining property to the east has previously had sand extracted from it.

3.2 Geology and Soils

The geology is described in Water Direct Pty Ltd. The resource lies on the Yelverton Shelf, Weaving S, 1998, *Geographe Bay Catchment, Natural Resource Atlas*, DPIRD (Department of Agriculture).

The soils of the resource area are well described in Tille P J and N C Lantzke, 1990, *Busselton – Margaret River Land Capability Study*, DPIRD (Department of Agriculture) Land Resource Series No 5 as Yd, Yelverton Deep Sandy Flats and Low Slopes.

On this site only the overlying sand sheet is impacted by excavation and consists of deep leached quartz sands.

The soils and excavation of sands are well known from the other sand pits that have operated and currently operate across the local area.

The resource typically has a grey sand overburden up to 100 mm thick over leached white silica sand grading to yellow sand.

A series of test pits were sunk across the sand resource to verify the sand. The location of the test pits are shown in Water Direct Pty Ltd 2020, Figure 2, which is attached.

3.3 Hydrogeology and Drainage

The Hydrogeology and Drainage is discussed in the Water Direct Pty Ltd study, which shows a drainage line in the north to Annie Brook. There is no surface water flow from the subject land.

The only water flows are through lateral movement of the superficial groundwater. On the pit footprint those flows are to the south east across the southern portion of Lot 75, as described by the Water Direct report and shown by the Section line through the pit Figure 6.

The headwaters of Annie Brook originate from the wetter areas at the north of Lot 75, near Haag Road. To the south of Lot 75 is Mary Brook, from which the headwaters of a small tributary originate just outside the central south western edge of Lot 75.

There are no water courses on the sand resource.

The hydrogeology was plotted on the Contour Survey Plan using a separation of 0.5 metres to the highest recorded water table, and that enabled the replotting of the proposed pit footprint and a section line through the proposed development.

The separation to the highest water table was changed from 1 metre in the previous documentation to 0.5 metre in compliance with DWER Water Quality Protection Note 15, (2019) Basic Raw Materials Extractive Industries. See Figure 16 for a Section Line.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Table 1: Hydrology and Pit Floor Management

HYDROLOGY – WATER AND PIT FLOOR MANAGEMENT	Compliance and Monitoring	Remediation	Timing
<p>Groundwater Flows – Floor Elevation</p> <p>The water table has been monitored from 2018 to 2020 and that data has been used to inform the hydrogeological report prepared by Water Direct Pty Ltd who used regional bore elevations to determine the winter maximum water table elevation.</p> <p>The excavated floor is to be a minimum of 0.5 metres separation to the highest seasonal water table based on Water Direct Figure 4 which takes into account the water monitoring from 2018 – 2020 as well as adding 0.2 metres to the measured AHD groundwater elevations to bring them into line with the historical groundwater elevations recorded by DWER Monitoring Bores.</p> <p>The proposed final floor elevation of the pit is designed by being 0.5 metres above the winter maximum water table elevation.</p> <p>The floor elevation maintains the pre-mine water table gradients from north west towards the south east.</p> <p>No surface flows of water are anticipated on the pit floor because like the current land surface of deep sand the sand on the floor of the pit will be too permeable to allow surface water flow.</p> <p>Currently there is no surface water flow from Lot 75 and the proposed pit quarry. That situation will be maintained. The lowest point of the pit will be the south eastern corner and with the batter slopes of the pit there will be no surface flows of water out of the pit.</p> <p>The catchment and water flow paths and volumes will not change as a result of the excavation.</p> <p>The groundwater from under the pit will continue to flow south east, away from the catchment of Annie Brook.</p> <p>Recharge from the removal of some trees and shrubs will lead to a small increase in recharge to the water table which will compensate for a drying climate.</p> <p>That is, there will be no changes to the water regimes and inflows to either Mary or Annie Brooks.</p> <p>Water Quality</p> <p>The operational Management proposed for the excavation includes management and removal of wastes and refuelling and servicing management.</p> <p>No fuel will be stored in the pit and all major servicing will be completed offsite.</p>	<p>The concept pit floor is 0.5 metres above the maximum winter ground water 2018 to 2020 plus 0.2 metres. (Water Direct Figure 4).</p> <p>Five water monitoring bores are installed at each corner of the proposed pit, NW, NE, SE and SW as well as the central south.</p> <p>Water monitoring has been completed through 2018 to 2020.</p> <p>The monitoring bores will be monitored in Autumn and late winter annually.</p> <p>At least one piezometer will be installed on the floor of each stage of the extraction to monitor the 0.5 separation to the winter water table.</p>	<p>If the water table is exposed on the floor of the pit the depression will be backfilled to comply with the 0.5 metre separation from the final land surface.</p> <p>If the highest winter water table is found to be different to the hydrogeological data the floor elevation of future stages will be adjusted up or down to compensate.</p>	<p>Autumn and late Winter during the life of the excavations.</p>

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

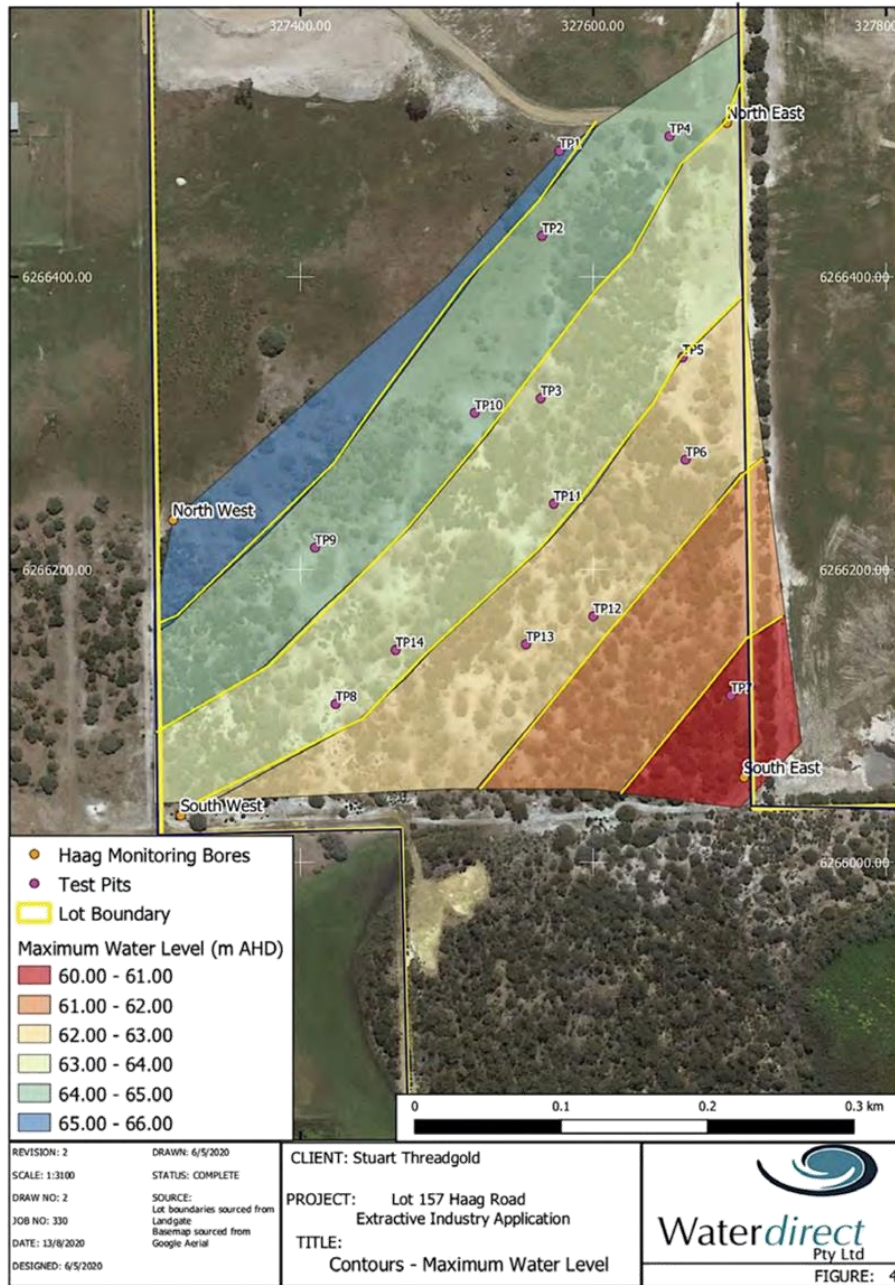


Figure 4: Maximum groundwater elevations (m AHD)



Figure 5. Aerial photograph of the sand resource. See Figure 2

3.4 Flora and Vegetation

3.4.1 Vegetation Present

Stream Environment and Water, 2018, completed a flora and vegetation survey of Lot 75. This added to a previous survey conducted by Eco Logic Environmental Services 2013, the data of which is incorporated into the current survey.

The site is located at the south westerly limit of the Swan Coastal Plain on the Whicher Scarp. The key vegetation units are the Yelverton Complexes.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

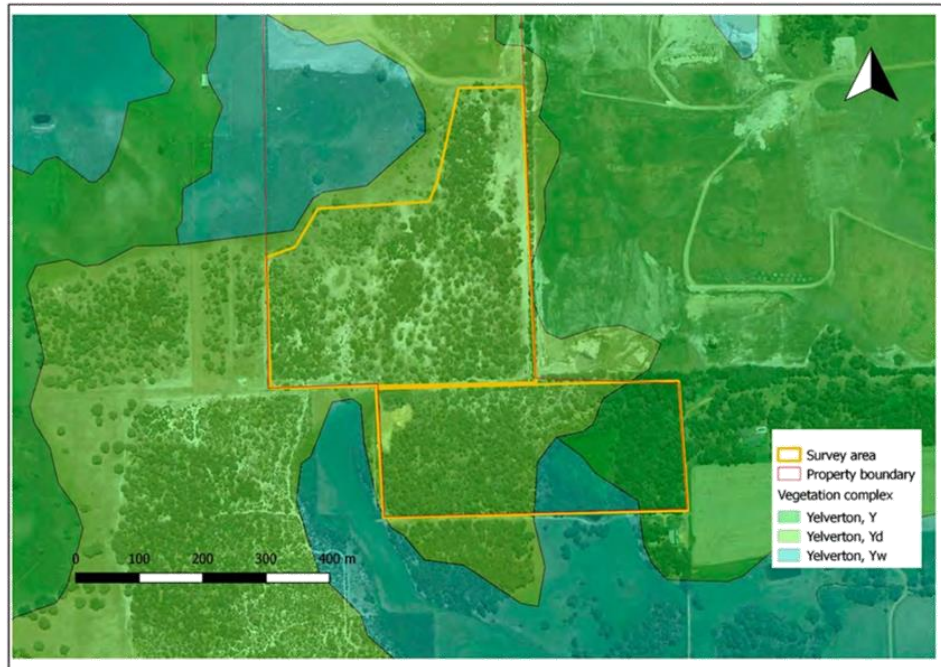


Figure 6: Vegetation Complexes (*Stream Environment and Water 2018*)

The field survey recorded 108 taxa of vascular plants from 37 families.

Thirteen of the 108 taxa are introduced. An additional 11 species (including 4 introduced species) were recorded in the previous survey by Ecological Environmental Services (2013) but were not recorded during the current project.

The dominant families in terms of number of taxa recorded (including all species from both surveys) were Myrtaceae with 12 taxa, Asteraceae with 10, Poaceae and Fabaceae both with 9 taxa.

No state listed DRF or priority flora species, or federally listed threatened flora species, were recorded in the project area in the current survey. The previous survey by Eco Logic Environmental Services (2013) recorded the priority 3 species *Stylidium loweriana*.

Two of the thirteen introduced flora species recorded during the survey, are listed as declared pest plants under the Biosecurity and Agriculture Management Act (2007), *Asparagus asparagoides* (bridal creeper) and *Zantedeschia aethiopica* (Arum lily) although Stream Environment and Water did not map the weed species for this project.

The vegetation is too degraded for sample plots to be effective and these were not completed by *Stream Environment and Water 2018*. However the vegetation descriptions of the proposed pit and the vegetation on the land to be protected as a Conservation Covenant provide the baseline local vegetation data. From that data the proposed Completion Criteria has been developed and is appropriate and achievable, based on revegetation of other sand pits in similar soils and parkland pasture. See the attached Flora and Vegetation Survey completed by Stream Environment and Water.

Therefore the location of reference sites are not applicable to this site.

The site is so degraded and has an absence of understorey that it was not possible for Stream Environment and Water to use 100 m² plots to assess the quality of the vegetation already on site.

It should be noted that not all plant communities have the same number of plants, and reduced species richness and plant density can be natural. *Agonis flexuosa* and *Allocasuarina fraseriana* produce phytotoxins to reduce competition from understorey and other trees.

In plant communities where these plants are prominent, the species richness and plant density is normally much less. Such communities can appear and even be listed as "Degraded" when they are in fact in "Good" or better condition. The test really is the number of exotic species rather than the lack of species richness and plant density.

On site reduced plant density and species richness can be expected to occur naturally in Peppermint-Sheoak Woodland (AgAfKg)

3.4.2 Significant Vegetation

Both the **Banksia Woodland (BaBiKg)** and the **Sheoak-Banksia Woodland (AfBaBi)** are consistent with the diagnostic characteristics of the *Banksia* Woodland of the Swan Coastal Plain TEC (listed under EPBC Act as Endangered and under State policy as Priority 3). Figure 5.

The TEC structure is typically low woodland to forest with a canopy dominated or co-dominated by a number of *Banksia* species, including as in this case *Banksia attenuata* (Commonwealth of Australia 2016). None of the contra-indicators i.e. dominant or co-dominant species such as *Banksia littoralis* are present in this community.

The Sheoak-Banksia Woodland (AfBaBi) has affinities with the State listed Priority 1 West Whicher Scarp *Banksia attenuata* woodland (B2) (which is a component of the EPBC listed *Banksia* Woodland of the Swan Coastal Plain TEC). However, the poor condition of the vegetation and disturbed nature of the understorey in particular, meant that definitive identification of the priority ecological community was difficult. *Kunzea glabrescens* also produces dense thickets that reduce the understorey and ground cover species.

Stream Environment and Water 2018 mapped 11.9 ha of *Banksia* woodland consistent with the characteristics of the federally listed *Banksia* Woodlands of the Swan Coastal plain threatened ecological community in the potential development area.

Of the 11.9 hectares, only 1.3 ha was in good condition and therefore meets the minimum requirement to be classified as the TEC but is under the minimum patch size of 2ha. **As the *Banksia* Woodland in Good Condition is below the patch size for referral to the Commonwealth under the EPBC 1999 listing, no referral is necessary.** Compare Figures 5 and 7.

The remainder of the *Banksia* Woodland is in degraded/good to degraded condition and therefore does not meet the minimum requirements to be classified as the TEC.

Vegetation Survey sites were conducted, but only in the better vegetation. Sample Site 8 lies at the southern edge of the amended resource area and Site10 lies just to the north of the amended pit footprint. Sites 6 and 9 lie to the west in the *Banksia* Woodland.

It can be seen that the best vegetation on the sand resource has 10 – 16 native species per 100 m² with 4 to 9 exotic species. From the site photographs it can be seen that there are significant areas where there is little or no overstorey and no ground cover. Figures 8 to 11. The location of the sample sites is shown in Figure 5.

On the other hand the southern remnant vegetation is in much better condition, with there being 2 or less exotic species in 6 of the 8 Sample Sites, with the number of native species ranging up to 36 in the sample plots. Several Sites such as Site 11 were deliberately located in disturbed ground. The vegetation cover is greater and ranges from 47 % to 147 %.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Table 2: Summary of 100 m² Sample Plots of the Best Vegetation on the Sand Resource

PLOT NUMBER	NATIVE SPECIES	EXOTIC SPECIES	% COVER OF NATIVE SPECIES
6 (outside the resource)	16	9	82 %
8	10	6	61 %
9 (outside the resource)	11	4	88 %
10 (outside the resource)	11	6	103 %

Table 3: Summary of 100 m² Sample Plots of the Southern Remnant Vegetation

PLOT NUMBER	NATIVE SPECIES	EXOTIC SPECIES	% COVER OF NATIVE SPECIES
1	36	0	47 %
2	32	1	74 %
3	18	0	125 %
4	11	2	92 %
5	21	1	147 %
11	21	7	83 %
12	16	6	65 %
13	29	0	87%

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

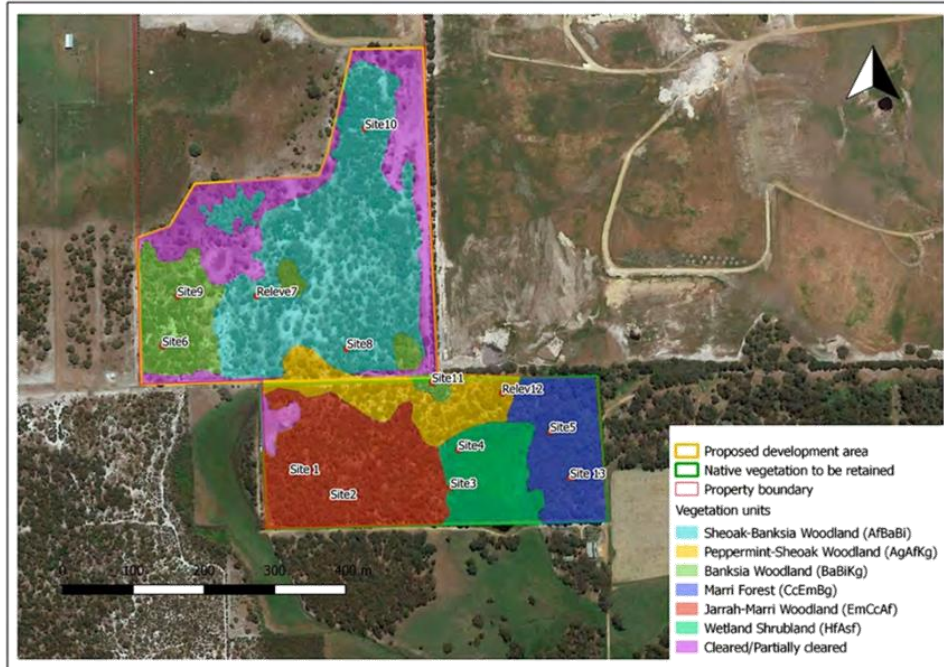


Figure 7: Vegetation Communities (*Stream Environment and Water 2018*)

The wetland area mapped as **Wetland Shrubland (HfAsf)** has possible affinities to the Priority 1 Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (G2) vegetation community. The landform is consistent with the description given by Keighery et al. (2008) for west Whicher Scarp valley wetlands of vegetation communities associated with permanent/near permanent wetlands fed by persistent freshwater seepages. Figure 7.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton



Figure 8: Aerial photograph of the offset land. Compare to Figures 5 and 7

Further survey (to assess additional quadrats) and analysis of floristic community types using regional datasets would be required to confirm the community described as the priority 1 ecological community.

The potential Priority Vegetation Community Wetland Shrubland (HfAsf), is to be retained in the southern vegetation that is to be protected and installed with a Conservation Covenant to ensure its long term protection and management.

Five taxa recorded during this survey were identified by Keighery et al. (2008) as significant taxa. Of the five taxa only one is found in the plant communities on the proposed sand pit, *Hibbertia ferruginea* which was recorded in the 2013 vegetation survey, but was not recorded in the current survey in spite of intensive field work. ***Therefore none of the listed significant species will be impacted by the proposed sand excavation.***

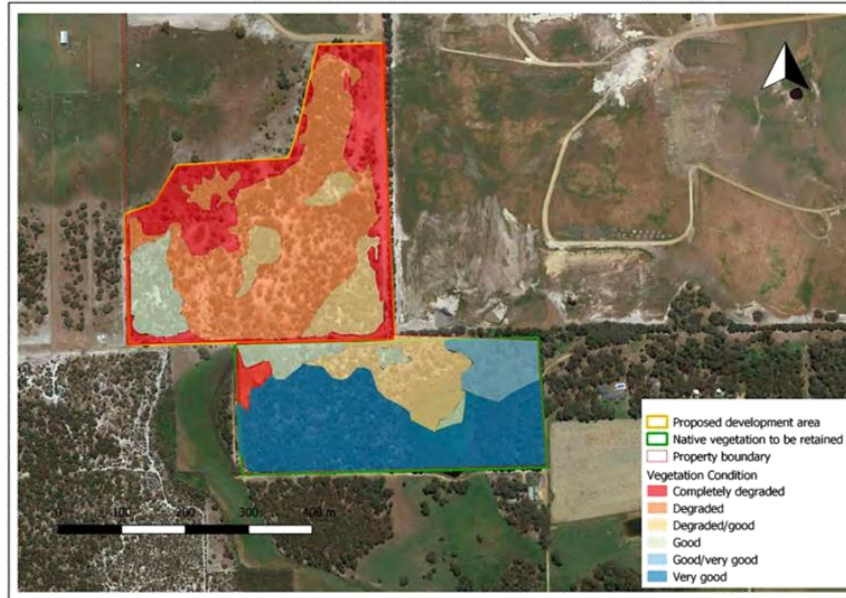


Figure 9: Vegetation Condition (Stream Environment and Water 2018)

3.4.3 Current Vegetation and Disturbance

Vegetation condition across the survey area ranged from “Completely Degraded” to “Very Good”.

In general, the condition of the northern portion of the survey area, which is proposed to be excavated, was in poor condition compared to the southern portion of Lot 11, which is to be retained and protected.

Historical grazing, and potentially dieback, have affected the structure of the vegetation in much of the excavation area. In this area the understorey has relatively poor diversity and cover of native species, in particular, a perennial native shrub layer is lacking in many areas. The overstorey is generally intact, however there are sparse patches and dead trees. Figures 10 to 13.

In contrast most of the vegetation in the southern portion of the property was mapped as good to very good condition. The southern area of vegetation is proposed for retention by the landholder and will be placed under a vegetation covenant.

Of the 11.9 hectares examined in the flora and vegetation survey, only 1.3ha was in good condition and therefore meets the minimum requirement to be classified as the TEC but is under the minimum patch size of 2ha. **As the Banksia Woodland in Good Condition is below the patch size for referral to the Commonwealth under the EPBC 1999 listing, no referral is necessary.** Figure 9.

The vegetation on the revised footprint is classified as predominantly Degraded with just over 1 hectare recorded by Ecological Environmental Services as being in Degraded to Good Vegetation.

Within the proposed conservation area is a small old gravel pit. See Figure 8, 9 and 15.

It is proposed to revegetate the gravel pit through the use of recovered local native topsoil and the application of local provenance species.

The vegetation condition of the southern area, proposed for conservation varies from “Degraded” to “Very Good”. However as noted in Section 3.4.1 above not all plant communities have the same number of plants, and reduced species richness and plant density can be natural.

Agonis flexuosa and *Allocasuarina fraseriana* produce phytotoxins to reduce competition from understorey and other trees and on site the plant density and species richness can be expected to occur naturally in Peppermint-Sheoak Woodland (AgAfKg). Such communities can appear and even be listed as "Degraded" when they are in fact in "Good" or better condition. The number of exotic species in addition to the species richness and plant density needs to be considered when making assessments.

3.5 Summary of the Vegetation to be cleared

The vegetation to be cleared is summarised in Section 3.4 Flora and Vegetation and in Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas.



Figure 10: Typical vegetation with a cluster of better overstorey in the distance.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton



Figure 11: Western and northern vegetation, generally outside the proposed resource area



Figure 12: Typical vegetation. Significant deaths of *Banksia* and no understorey



Figure 13: Typical vegetation. Degraded overstorey and no understorey

Minimisation of potential flora impacts are summarised below;

- The disturbance footprint has been reduced from 11.5 hectares to 5.0 hectares.
- The end use of the sand pit will be to local native *Banksia* Woodland vegetation.
- The condition of the vegetation to be cleared is shown as near 4.0 hectares of Degraded vegetation with just over 1 hectare as Degraded to Good.
- The perimeter vegetation will be retained.
- Most of the *Banksia* Woodland is retained.
- The wetland vegetation will be retained under Conservation Covenant
- The 10.1 hectare block of vegetation in the south, which contains feeding habitat for Black Cockatoos, will be retained, upgraded and protected by Conservation Covenant.
- A 2.9 hectare block of sand ridge vegetation will be protected by Conservation Covenant and the vegetation quality upgraded.
- The small gravel pit will be revegetated.

3.6 Fauna

Greg Harewood completed a Targeted fauna assessment in 2019 (Harewood G, 2019, Targeted Fauna Assessment, Lot 75 Haag Road Yelverton).

The main fauna identified as being potentially present and of significance are the Western Ring Tail Possum and the three species of Black Cockatoo.

During the survey, trees with hollows were recorded and checked for suitability and use by fauna.

The site does lie within the distribution of **Western Ringtail Possums**. However the site investigations conducted by Greg Harewood did not find any evidence of their presence on Lot 75.

If present the species utilise *Agonis* Peppermint, Jarrah and *Nuytsia* as food sources, all of which are present on the proposed pit footprint. The surrounding perimeter vegetation is to be retained and the large area of vegetation in the south will be retained under Conservation Covenant.

In order to increase the suitable habitat for Ring Tail Possums, it is proposed to add more local native vegetation, particularly *Agonis* Peppermint and Jarrah, which will be added in the vegetation retained and on the batter slopes to increase the habitat and vegetation connectivity for Western Ring Tail Possums.

The habitat suitable for **Black Cockatoos** was assessed. Greg Harewood found twelve trees with a trunk diameter of >500 mm. Six appeared to contain hollows but none large enough for use as Black Cockatoo nesting. No roosting trees were recorded. The vegetation on the pit footprint provides foraging habitat for one or more species.

Minimisation of potential fauna impacts are summarised below;

- The disturbance footprint has been reduced from 11.5 hectares to 5.0 hectares.
- The pit will be returned to Banksia Woodland to provide food resources for Black Cockatoos.
- The revised excavation footprint has reduced the impacts with only four trees with hollows now lying within the excavation footprint.
- Only six of the trees of > 500 mm diameter lie within the revised footprint.
- Hollows recovered from trees at clearing will be retained and installed in retained remnant vegetation.
- The perimeter vegetation will be retained and added to and the block of vegetation in the south, which contains feeding habitat for Black Cockatoos, will be retained and protected by Conservation Covenant.
- Additional local native vegetation of Black Cockatoo feed habitat species will be added to the retained vegetation and provided with better conservation protection to minimise or negate the impacts of excavation on Black Cockatoo habitat.
- Hollows recovered from trees at clearing will be retained and installed in retained remnant vegetation.
- A review of the fauna and capture of fauna prior to clearing will be conducted by an approved fauna expert. That will most likely target species such as possums and Quenda which are anticipated to be the most mammalian fauna impacted by clearing.
- Additional local native vegetation of Black Cockatoo feed habitat species will be added to the retained vegetation to minimise or negate the impacts of excavation on Black Cockatoo habitat.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

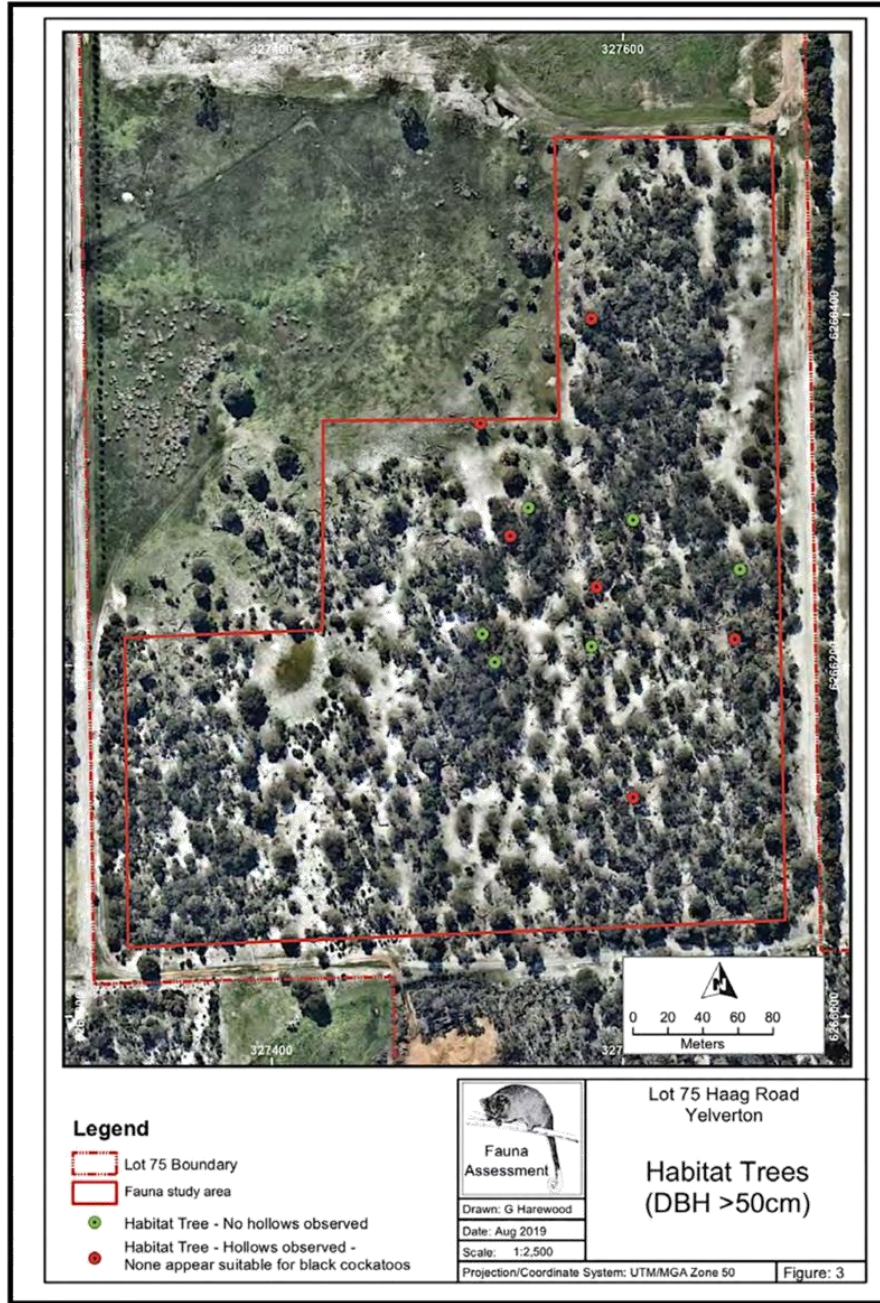


Figure 14: Location of larger trees and trees with hollows (Harewood 2019)

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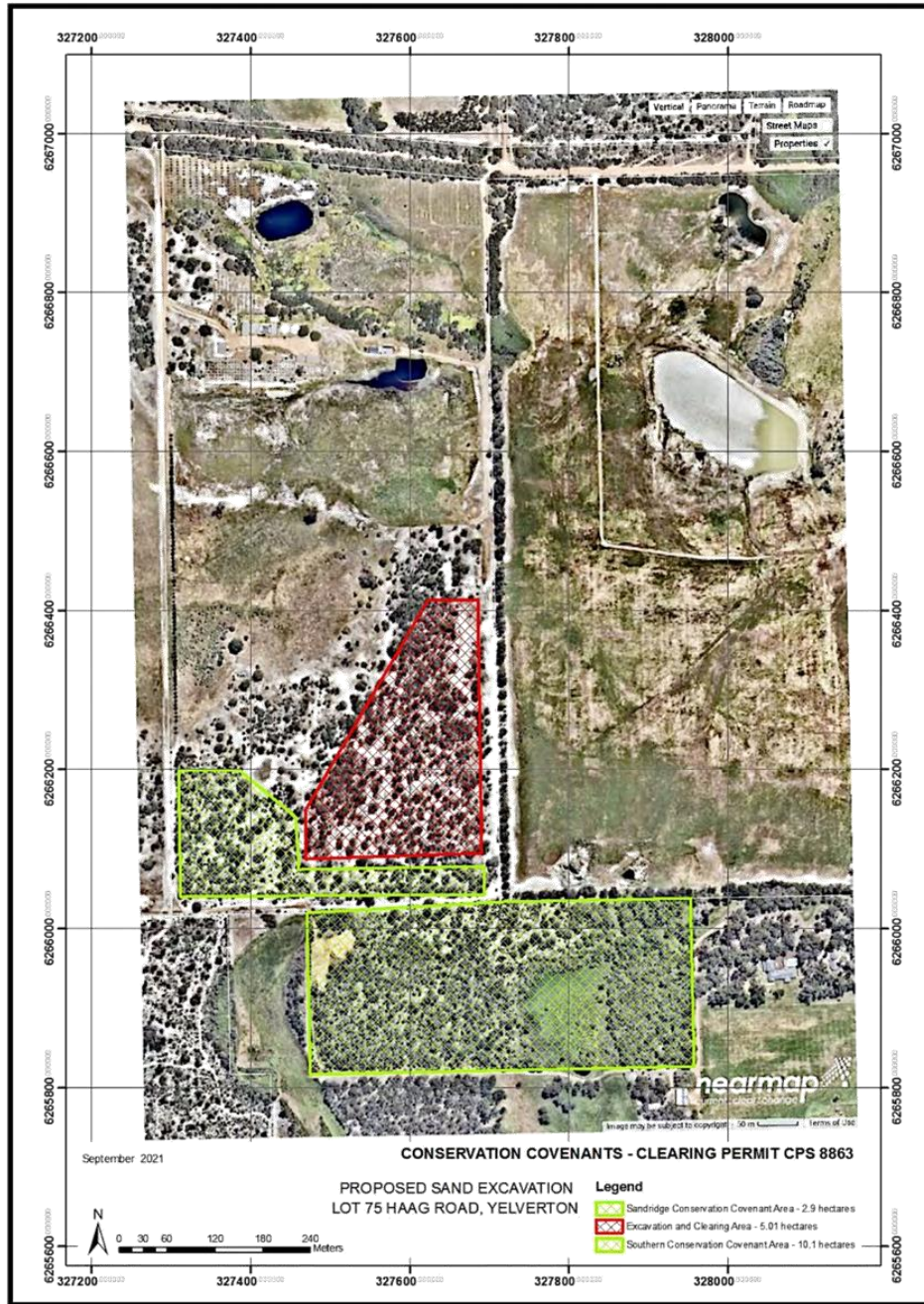


Figure 15: Pit Footprint and Conservation Covenants

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

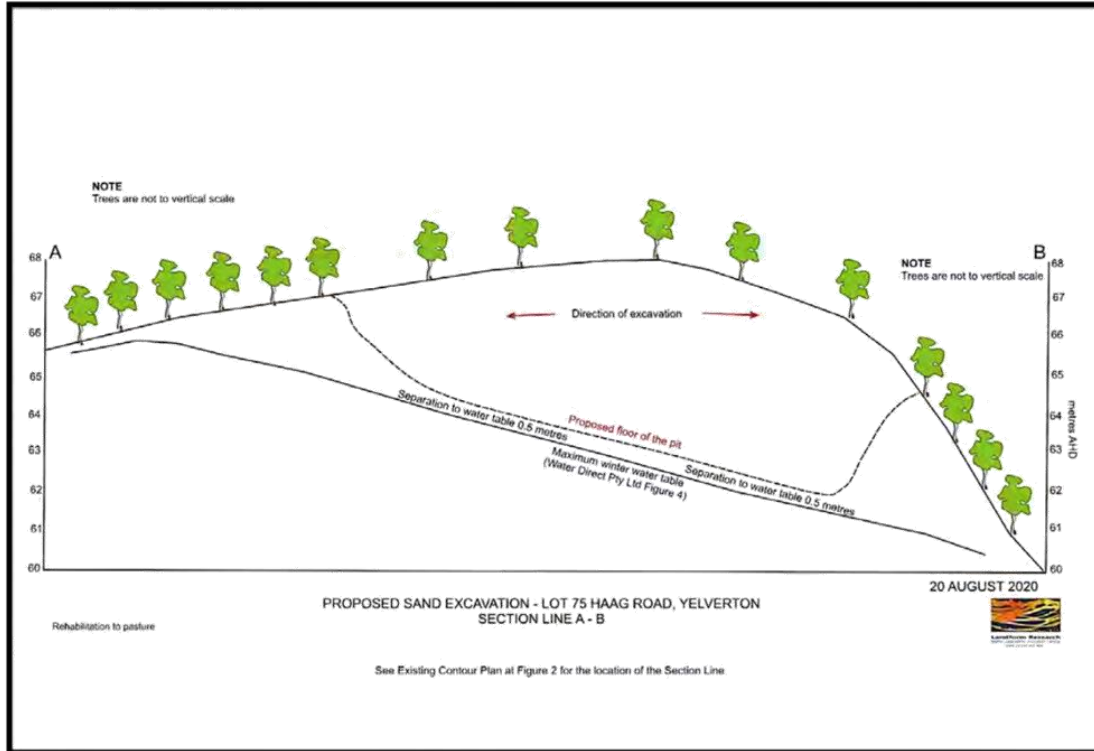


Figure 16: Section Line (See Figure 2 for the location of the section)

3.6.1 Conservation Covenants and Mitigation to Clearing

Southern Offset Vegetation Conservation Area

The southern portion of Lot 75 will be offered as an offset to the clearing of the resource area. The offset comprises a range of community types suitable for cockatoos, Ringtail Possum and other fauna such as Quenda.

Whilst the proposed offset has some vegetation in Degraded Condition, the majority of the vegetation is in Good to Very Good Condition. Figure 7.

An offset of 10.1 hectares of the southern remnant vegetation will be protected by Conservation Covenant under *Section 30B of the Soil and Land Conservation Act 1945* and revegetated to "Very Good Condition", (Keighery 1994).

The Conservation Covenants will provide additional protection and enhancement of the remnant vegetation, subject to the provision of a perimeter fire break outlined in green on Figures 7, 8 and 9.

The potential Priority Vegetation Community Wetland Shrubland (HfAsf), which occurs in the offset is to be retained in the southern vegetation that is to be protected.

That portion of land requires a fire break, as required by the City of Busselton by way of email dated 25 March 2020 from the Ranger and Emergency Services of the City of Busselton.

The firebreak will be installed around the perimeter of the portion of the vegetation to the requirements of the City of Busselton. There is a difficulty constructing the fire break along all of the southern edge of the land due to the wetland area at that location. The fire break will either be installed at the wetland in summer or that section deleted because it adjoins cleared farm land. In other locations the fire break will be perimeter or, if significant vegetation/trees occur, it will be strategic around those features.

The vegetation will be maintained by the landholder for the life of the Conservation Covenant.

Old Gravel Pit Revegetation

The 0.3 hectare old gravel pit contained in the southern vegetation conservation area will be regenerated to local native vegetation in "Very Good Condition", (Keighery 1994).

The old gravel pit (around 0.3 hectares) will be revegetated with local native species by the direct return of topsoil from the adjoining bush and from topsoil removed by gravel extraction.

Sand Ridge Conservation Area

An offset of 2.9 hectares of the sand ridge resource, west of the proposed pit will be retained under Conservation Covenant under *Section 30B of the Soil and Land Conservation Act 1945*. and revegetated to "Good" Condition, (Keighery 1994).

Excavated Resource Area Revegetation

The proposed extraction area is reduced from 11.5 hectares to 5.01 hectares.

The base of the pit will be ripped and if there is insufficient topsoil local provenance seeds and tube plants will be installed and brushing by Myrtaceae and Proteaceae branches removed from clearing for the sand pit, to provide sources of seeds.

Local species used in the revegetation will provide food resources suitable for Western Ringtail Possums and Black Cockatoos.

The whole of the pit will be revegetated to local native vegetation to "Good" Condition", (Keighery 1994). At the end of excavation and revegetation the excavated area will lift from vegetation in "Degraded Condition" to vegetation with "Good Condition".

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

4.0 CURRENT DISTURBANCES AND ENVIRONMENTAL THREATS

A Risk Assessment of the proposed sand extraction is provided in the *Development Application (Sand Extraction) 2019 – Social Impact Assessment provided to the City of Busselton in support of the Application, Section 7.0 and Table 7.*

The current environmental threats to the existing vegetation are those related to the current and past land uses.

Table 4: Current and Baseline Potential Impacts on Vegetation

Environmental Threat	Description of Potential Impact	Inherent Risk				Comments on the Potential Risks	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
Existing Risks to the Vegetation on the Resource Area							
Vegetation will be impacted by grazing	Grazing stock may chew the bark of overstorey vegetation, compact the soil beneath the vegetation	Moderate	Likely	HIGH	High	<p>The vegetation on the resource area has been grazed in the past by previous landholders. That has lead to removal of all the understorey and progressive impact on the upper storey.</p> <p>Many of the <i>Banksia</i> have died over the years and there is only one small area remaining predominantly in the west of the resource area which has been excluded from the modified pit footprint.</p> <p>It remains unclear why the <i>Banksia</i> have died as the <i>Phytophthora</i> Assessment did not detect any infestations. Soil impacts and compaction may have contributed to the decline of the overstorey</p> <p>The current owner does not have grazing stock on site. Therefore the proposed resource is not currently fenced from the remainder of the land, although the whole of Lot 75 is fenced.</p> <p>From time to time stock will be required on Lot 75 to reduce the summer fire hazard and fuel loadings. Any introduction of stock are likely</p>	Figures 10, 12 and 13 shows the death of the <i>Banksia</i> in the west.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Environmental Threat	Description of Potential Impact	Inherent Risk				Comments on the Potential Risks	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
Vegetation may be impacted by Dieback	<i>Phytophthora</i> if introduced or spread is likely to lead to continued decline of the remnant vegetation on the resource area.	Moderate	Possible	MEDIUM	High	One <i>Phytophthora</i> test was completed on a <i>Banksia</i> in 2017 and did not show any presence of dieback, however it is possible that dieback could be introduced through farm practices or spread from adjoining properties If introduced then the current susceptible vegetation could be expected to continue to decline.	Figures 11, 12 and 13. Development Application Section 7.1, Table 7 and Appendix D. Operations Environmental Management Plan – Sand Extraction 2019, Section 2.2.1.2 Clearance.
Threatened Vegetation Communities may be impacted	The quality and area of <i>Banksia</i> Woodland will reduce	Moderate	Likely	HIGH	High	There has already been significant impact on <i>Banksia</i> with dead trees present and others dying. Without management it is anticipated that the degradation will continue.	
Threatened fauna may be impacted	Black Cockatoos are dependant on Eucalypts and <i>Banksia</i> for food resources which may reduce. The potential habitat for Western Ringtail Possums may reduce	Insignificant	Likely	MEDEIUM	High	The quality of the overstorey will continue to degrade without management and replenishment, which will gradually reduce the food resources on Lot 75. There are no trees with hollows suitable for breeding. Whilst Western Ringtail Possums utilise <i>Agonis flexuosa</i> they also utilise Eucalypts and understorey species for food resource and habitat. There have been significant reductions in the overstorey, and the understorey is almost totally replaced by pasture. Without management both the overstorey and understorey habitats are anticipated to reduce.	
Pasture species will suppress overstorey viability	Pasture understorey and ground cover takes water and nutrients and is likely to prevent the natural regeneration of the overstorey from self seeding.	Moderate	Likely	HIGH	High	There are few to no seedlings germinating or growing from natural regrowth, possibly due to competition from the pasture understorey.	Stream Environment and Water, 2019, <i>Flora and Vegetation Assessment</i> .

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Environmental Threat	Description of Potential Impact	Inherent Risk				Comments on the Potential Risks	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
Weeds will impact the vegetation	Weeds and naturalised plants may impact the potential for natural regeneration of the native vegetation.	Moderate	Possible	MEDIUM	High	A total of 13 naturalised species were recorded. Some of these are pasture species. The presence of weeds could increase without control, further impacting the existing vegetation on site.	Stream Environment and Water, 2019, <i>Flora and Vegetation Assessment</i> .
Age of the vegetation and Fire Frequency	Native vegetation will over time age and may be a factor in the death of <i>Banksia</i> as may be the lack of fire.	Minor	Unlikely	LOW	High	The vegetation will age and with no replacements the existing vegetation will decline over time	Stream Environment and Water, 2019, <i>Flora and Vegetation Assessment</i>
Existing Risks to the Southern Remnant Vegetation							
Vegetation will be impacted by grazing	Grazing stock impact the vegetation	Moderate	Unlikely	MEDIUM	High	The southern portion of Lot 75 has perimeter fencing in place and has not been grazed by the current owner.	Figures 6 and 8.
Vegetation will be impacted by Dieback	<i>Phytophthora</i> if introduced or spread is likely to lead to continued decline of the remnant vegetation on the resource area.	Major	Possible	HIGH	High	One <i>Phytophthora</i> test was completed on a <i>Banksia</i> in 2017 and did not show any presence of dieback, however it is possible that dieback could be introduced through farm practices or spread from adjoining properties If introduced the current susceptible vegetation could be expected to continue to decline.	Figures 10 to 13. Development Application Section 7.1, Table 7 and Appendix D.
Weeds will impact the vegetation	Weeds and naturalised plants may spread onto the site or the existing weeds may spread and impact native vegetation.	Moderate	Almost Certain	HIGH	High	Although the weed load is lower, there are some more invasive species such as <i>Zantedeschia aethiopia</i> , <i>Avena</i> spp and <i>Asparagus asparagoides</i> . Two of the introduced flora species recorded during the survey, are listed as declared pest plants under the Biosecurity and Agriculture Management Act (2007), <i>Asparagus asparagoides</i> (bridal creeper) and <i>Zantedeschia aethiopia</i> (Arum lily). The presence of weeds could increase without control, further	Stream Environment and Water, 2019, <i>Flora and Vegetation Assessment</i> .

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Environmental Threat	Description of Potential Impact	Inherent Risk				Comments on the Potential Risks	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
						impacting the existing vegetation on site.	
Firebreaks	Fire may adversely affect the remnant vegetation.	Moderate	Possible	MEDIUM		The City of Busselton has notified the landowner that they must construct a fire break around the southern remnant vegetation. That fire break opens a path for the introduction and or spread of weeds. On the other hand the fire break will enable better access to treat significant exotic species.	

See Table 6 for Risk Assessment Criteria

5.0 CLOSURE AND REVEGETATION

5.1 Introduction and Purpose

Background

There has been previous sand excavation on site, to the north of the proposed extraction. That was completed under Planning Approval (DA13-0228) from the City of Busselton and Clearing Permit CPS 5606/1.

The property owner is seeking to develop land at Lot 75 Haag Road, Yelverton for the purposes of sand extraction through the City of Busselton DA20/0437. The Development Application and Extractive Industry Licence have yet to be determined by the City of Busselton.

To enable the excavation of sand a Clearing Permit CPS 8863/1 has been applied for.

Originally the project application was for a footprint of around 11.5 hectares, but through discussions with DWER this has been reduced to around 5 hectares as defined in the amended application area for CPS 8863/1. The same amended excavation footprint will be applied to City of Busselton DA20/0437.

The project will supply the local building and construction industry, Main Roads WA projects and civil works with an estimated 200,000 tonnes of quality grade building sand and fill material over a five year period. The principal markets to be supplied with this depleting resource are Busselton, Vasse and Dunsborough areas which are still experiencing prolonged growth.

It is proposed to extract the sand in three stages of 2.0, 2.0 and 1.0 hectares.

This rehabilitation plan uses similar techniques to the previously approved plan and building on and extending the plan to cover the various aspects of the proposed sand extraction of 5 hectares of sand resource from the central south of Lot 75.

The Rehabilitation Plan is in line with *A guide to preparing revegetation plans for clearing permits (DWER 2018)*.

5.2 Final Landform of Excavation

The floor of the pit will be determined by the hydrogeology and the groundwater elevations as discussed at Section 3.3 Hydrogeology and Drainage.

The pit will be shallow, varying from 1 metre to around 4 metres deep.

The floor will be gently sloping to the south, similar to the pre-excavation land surface.

The perimeter vegetation around the outside of the proposed pit will be retained. Figure 2

The proposed revegetation will be to local native vegetation across the central floor of the proposed pit with revegetation to local native vegetation around the batter slopes of the completed faces of the pit. See the yellow hatched area.

In addition a Conservation Covenant is offered for the land on the southern portion of Lot 75 as shown on Figure 1.

Within the portion of the proposed Conservation Covenant area is a small old gravel pit of around 0.3 hectares, that will be revegetated.

The Conservation Covenant and its management is described in Section 4.4.

The remnant vegetation to be retained is discussed in Section 4.9 Hydrology – Water Management.

5.3 Responsibilities

This Revegetation Plan has been prepared by Landform Research whose contact details are at the front of the document.

All Approvals will be held by the landholder.

All excavation will be conducted by the landholder Stuart Threadgold who is the applicant for the proposed sand extraction through the City of Busselton and the applicant for Clearing Permit CPS 8863/1.

Stuart Threadgold will be responsible for all approvals, extraction of the sand, restoration and revegetation of the disturbed land and provision of the offset Conservation Covenant.

The nomination of the responsibilities are listed under *Environmental Management in the Operations Environment Management Plan 2019*.

5.4 Current Disturbances and Environmental Threats

A number of site specific studies have been conducted on site:

- *Stream Environment and Water, 2018*, completed a flora and vegetation survey of Lot 75. This added to a previous survey conducted by Eco Logic Environmental Services 2013, the data of which is incorporated into the current survey.

The survey covered the flora and vegetation, and is attached, and summarised in Section 3.4 of this document.

- *Greg Harewood* completed a Targeted fauna assessment in 2019 (Harewood G, 2019, Targeted Fauna Assessment, Lot 75 Haag Road Yelverton).

The survey is attached and is summarised in Section 3.5 of this report.

- Water Direct Pty Ltd, August 2020, *Hydrogeological Assessment Extractive Industries Approval, for S and C Threadgold, 157 Haag Road Yelverton*.

The study is summarised in Section 3.3 and is attached.

Other studies were completed on the potential impacts of dust and noise and were provided to the City, in support of the Development Approval Application.

5.5 Completion Criteria

The Completion Criteria is informed by the 100 m² Sample Site data contained in *Stream Environment and Water, 2019, Flora and Vegetation Assessment*. See Tables 1 and 2 and *Stream Environment and Water, 2018, completed a flora and vegetation survey of Lot 75*.

It should be noted that the Completion Criteria are the criteria to be signed off on, rather than a planting regime and an 80% survival rate of the tube plants.

5.5.1 Completion Criteria of the Excavated Resource Area

Without topsoil, and in consideration of the species likely available from direct seed collection and commercially, a reasonable and achievable species richness and vegetation cover has been selected.

On the other hand the revegetation must be able to be completed in a manner that is sustainable and result in better quality closure vegetation than the existing vegetation.

The Sample Sites on the resource were selected based on the best vegetation and provide an indication of the likely revegetation completion criteria. However the collected data does not provide any data on the number of plants per 100 m², but rather the species richness and vegetation cover.

The sample plots have an average of 12 species / 100 m². The average vegetation cover is 83.5 % which can only be achieved over time.

Completion Criteria for the Resource Area are;

- *Species richness is 8 species /100 m².*
- *Plant density is 1 plant / m².*
- *Minimum 250 habitat tree species per hectare, Eucalyptus, Agonis flexuosa, Nuytsia floribunda and Banksia, suitable as habitat for Ringtail Possum and Black cockatoos.*

- **Target vegetation Condition to be "Good" based on Keighery 1994.**
- **< 20% bare ground assessed as vegetation cover.**
- **Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.**

Monitoring

- **Four 100 m² sample plots, combined with annual field monitoring and photographic verification for 5 years until the completion criteria are met.**

5.5.2 Completion Criteria of the Southern Remnant Vegetation

The sample data for the better vegetation can be used to inform the Completion Criteria for degraded areas to be revegetated. Whilst the average species richness is 23 per 100 m², it can be difficult to achieve this without the use of topsoil.

A Conservation Covenant is offered to cover the southern portion of vegetation on Lot 75, which is in Good to Very Good Condition. Total 10.1 hectares. See Figure 15. The Conservation Covenant will help offset the clearing of vegetation for the extraction of sand.

That portion of land requires a fire break as required by the City of Busselton by way of email dated 25 March 2020 from the Ranger and Emergency Services of the City of Busselton.

The firebreak will be installed around the perimeter of the vegetation to the requirements of the City of Busselton. There is a difficulty constructing the fire break along all of the southern edge of the land due to the wetland area at that location.

The fire break will either be installed at the wetland in summer or that section deleted because it adjoins cleared farm land. In other locations the fire break will be perimeter or if significant vegetation/trees occur it will be strategic around those features.

The vegetation will be maintained by the landholder for the life of the Conservation Covenant.

Whilst the Completion Criteria requires the vegetation listed as "Degraded" to be revegetated to "Very Good" the assessments need to be made by site specific on ground review to determine whether the vegetation is actually "Degraded" or as a result of phytotoxins.

As noted previously not all plant communities have the same number of plants, and reduced species richness and plant density are normal. *Agonis flexuosa*, *Allocasuarina fraseriana* and *Kunzea glabrescens* all produce phytotoxins to reduce competition from understorey and other trees. Therefore what visually appears to be "Degraded" may in fact be a result of phytotoxins in parts of the Peppermint-Sheoak Woodland (AgAfKg). The test is the number of exotic species rather than the lack of species richness and plant density.

The combination of seeding and tube planting will depend on the existing vegetation quality, and species present, with tube planting predominant in the areas with existing ground cover. The planting and seeding will match the requirements to upgrade the vegetation. The species selected in each degraded area will be selected to specifically enhance the deficient vegetation layers in that local area.

The completion criteria does not allow for the naturally lower plant density and species richness of the Peppermint-Sheoak Woodland (AgAfKg). Using the data for other communities may not be appropriate in that community and an allowance may be considered when assessing the cut offs for that vegetation type.

Completion Criteria for the southern Remnant Conservation Vegetation;

- **Conservation Covenant under Section 30B of the Soil and Land Conservation Act 1945 prior to commencement of excavation.**
- **No degradation in vegetation quality.**
- **Target vegetation Condition to be "Very Good" based on Keighery 1994 based on Baseline Sample Plots (Stream Environment and Water 2018) located in Vegetation of Very Good Condition; Sample Sites 1, 2, 3, and 13. See note about Peppermint-Sheoak Woodland (AgAfKg) above.**
- **Bare Ground < 20% average.**
- **Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.**

5.5.3 Completion Criteria of the Old Gravel Pit

The old gravel pit (around 0.3 hectares) will be revegetated with local native species by planting of tube plants and seeding. See Figure 15.

This will lift the vegetation quality of the vegetation in the south to be placed under Conservation Covenant.

The base of the pit will be ripped and local provenance seeds and tube plants will be installed.

The average vegetation cover of the southern remnant vegetation is 90 %, which can only be achieved over time.

The Completion Criteria for the Gravel Pit is;

- *The species richness is 12 species /100 m² for the revegetation of the gravel pit.*
- *The proposed plant density is 1 plant / m².*
- *Minimum 250 habitat tree species per hectare, Eucalyptus, Agonis flexuosa, Nuytsia floribunda and Banksia at 3 years.*
- *Target vegetation Condition to be "Very Good" based on Keighery 1994 based on Baseline Sample Plots (Stream Environment and Water 2018) located in Vegetation of Very Good Condition; Sample Sites 1, 2, 3, and 13.*
- *< 20% bare ground assessed as vegetation cover.*
- *Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.*

5.5.4 Completion Criteria of the Sand Ridge Conservation Area

An area of 2.9 hectares of remnant vegetation to the west of the proposed excavation is proposed to be placed under Conservation Covenant to complement the southern remnant vegetation conservation area and assist in offsetting the clearing required for sand excavation. The area will be revegetated with local native species by the addition of some topsoil removed by sand extraction, seeding and tube planting. See Figure 15.

The surface will be ripped if required, and local provenance seeds and tube plants will be installed in degraded areas, combined with brushing by Myrtaceae and Proteaceae branches removed from clearing for the sand pit, to provide additional sources of seeds. The combination of seeding and tube planting will depend on the existing vegetation quality, with tube planting predominant in the areas with pasture ground cover.

The Completion Criteria for the Sand Ridge Conservation Area is;

- *Conservation Covenant under Section 30B of the Soil and Land Conservation Act 1945 prior to commencement of excavation.*
- *The species richness is 12 species /100 m².*
- *The plant density is 1 plant / m².*
- *Minimum 250 habitat tree species per hectare, Eucalyptus, Agonis flexuosa, Nuytsia floribunda and Banksia at 3 years.*
- *Target vegetation Condition to be "Very Good" based on Keighery 1994.*
- *< 20% bare ground assessed as vegetation cover.*
- *Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.*

5.6 Monitoring of Revegetation

The Completion Criteria is informed by the 100 m² Sample Site data contained in Stream Environment and Water, 2019, Flora and Vegetation Assessment. See Tables 1 and 2 and *Stream Environment and Water, 2018*, completed a flora and vegetation survey of Lot 75.

6.0 CLOSURE AND REVEGETATION

The Staging, Clearing, topsoil recovery and Rehabilitation of Lot 75 is provided in the *Operations Environmental Management Plan (Sand Extraction) 2019 provided to the City of Busselton in support of the Application, Section 2.0*.

The methodology in this and the Operations Environmental Management Plan will complement each other with the procedures being incorporated into this summary of closure and revegetation.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Table 5: Summary of the Rehabilitation Procedures

Stage of Rehabilitation	Southern Conservation Area	Sand Resource Conservation Area	Old Gravel Pit	Excavation Area
Conservation Covenant	An offset of 10.1 hectares will be retained under Conservation Covenant under <i>Section 30B of the Soil and Land Conservation Act 1945</i> .	An offset of 2.9 hectares of the sand ridge resource, west of the proposed pit will be retained under Conservation Covenant under <i>Section 30B of the Soil and Land Conservation Act 1945</i> , and revegetated to "Good" Condition, (Keighery 1994).	The 0.3 hectares of old gravel pit will be included in the Conservation Covenant of the Southern Conservation Area.	
Staging	The Conservation Covenant will be in place prior to excavation commencing. Revegetation will commence within the first year of commencement. Fencing will be completed within the first year.	The Conservation Covenant will be in place prior to excavation commencing. Revegetation will commence within the first year of commencement. Fencing will be completed within the first year.	The Conservation Covenant will be in place prior to excavation commencing. Revegetation will commence within the first year of commencement.	The proposed pit of 5.0 hectares has two stages of 2.0 hectares and a final stage of 1 hectare. Clearing and excavation will be completed in stages, with Stage 1 being closed at the same time as Stage 2 is being opened and excavated.
Non natural materials	Apart from fencing, any non natural inert materials will be collected and removed from site prior to soil reconstruction and/or revegetation.	Apart from fencing, any non natural inert materials will be collected and removed from site prior to soil reconstruction and/or revegetation.	Any non natural inert materials on the old gravel pit will be collected and removed from site prior to soil reconstruction and/or revegetation.	All non natural inert materials associated with quarrying that are not required for future use on Lot 75 will be collected and removed from site unless required for internal roads. If not required, roadbase, hardstand and any other inert materials left over from the site operations will be scraped and picked up and will be used to backfill the pit faces or reused. Faces and the landform are to comply with DMIRS Guidelines for the restoration of sand pits and be stable for the long term. Faces will be pushed down or backfilled to be similar to the Concept Final Contour Plan, Figure 3.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage of Rehabilitation	Southern Conservation Area	Sand Resource Conservation Area	Old Gravel Pit	Excavation Area
Landform restoration	Landform change not required.	Landform change not required.	Landform change not required.	<p>Faces and the landform are to comply with DMIRS Guidelines for the restoration of sand pits and be stable and safe for the long term.</p> <p>The landform to the adjoining excavated and non excavated surfaces.</p> <p>The excavated floor is to be a minimum of 0.5 metres separation to the highest seasonal water table. Figures 4 and 6.</p> <p>Batter slopes are to be 1 : 4 vertical to horizontal. This is different to the floor of the pit which will be retained at 1 : 10 vertical to horizontal, which maximises the sand resource and still provides for developable and usable land.</p> <p>See the Concept Final Contour Plan, Figure 3.</p> <p>The excavated surface is to be resistant to wind and water erosion.</p> <p><i>(Operations Environmental Management Plan (Sand Extraction) 2019, Section 2.2.5.1 Earthworks, and Section 3.1.3, Site Drainage, Water Quality and Sediment Control).</i></p>
Soil reconstruction	Not required.	Not required.	<p>Soils are to be constructed from overburden overlain by topsoil, leaf litter, vegetation fragments as available in areas of native vegetation.</p> <p>The old gravel pit will be deep ripped.</p> <p>Any topsoil cover of 50 – 100 mm that was pushed to the edge of the excavation will be respread as the</p>	<p>The soils are to be constructed from overburden overlain by topsoil, leaf litter, vegetation fragments as available in areas of native vegetation.</p> <p>The floors and batter slopes will be deep ripped along contour if required.</p> <p>The topsoil cover of 50 – 100 mm that was pushed to the edge of the current excavation in separate windrows will be</p>

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage of Rehabilitation	Southern Conservation Area	Sand Resource Conservation Area	Old Gravel Pit	Excavation Area
			final surface covering.	respread as the final surface covering. Any overburden will be used as backfill.
Clearing and treatment of vegetation	No clearing.	<p>No clearing.</p> <p>Smaller vegetation and branches cleared from Stage 1 will be used in revegetation for a source of seed, by spreading between existing vegetation.</p> <p>Nesting and other hollows cleared from Stage 1 will be installed on site.</p> <p>Any burnt materials and the ash will be used for soil amendments if available, to increase seed germination and nutrients; replicating natural vegetation – fire management interactions.</p>	<p>No clearing.</p> <p>Mulching is not recommended for revegetation as it smothers and inhibits germination of native seed.</p> <p>Smaller vegetation and branches cleared from Stage 1 can be used in revegetation for a source of seed, by spreading between existing vegetation.</p> <p>Nesting and other hollows cleared from Stage 1 can be installed on site.</p> <p>Any burnt materials and the ash will be used for soil amendments if available, to increase seed germination and nutrients; replicating natural vegetation – fire management interactions.</p>	<p>During clearing fauna will be captured and relocated.</p> <p>Trees hollows will be salvaged and re-established in secure locations.</p> <p>Vegetation will be cleared by pushing into perimeter stockpiles. Excess timber will be used for fence posts, fire wood, and craft uses, subject to site and use safety.</p> <p>Vegetation and recovered materials will be stored no closer than 50 metres to the lot boundaries.</p> <p>Smaller vegetation and branches will be used in revegetation for a source of seed, by spreading on the batter slopes and rehabilitation areas and the sand conservation area.</p> <p>Vegetation being cleared from Stage 2 will be used for revegetation of Stage 1 to substitute for vegetation recovered from Stage 1.</p> <p>Mulching is not recommended for revegetation as it smothers and inhibits germination of native seed.</p> <p>Nesting and other hollows will be retained for re-installation in remnant vegetation.</p> <p>Topsoil and vegetation fragments will be transferred directly from an area being cleared and spread across the surface to provide seed sources and habitats wherever possible. If direct transfer is not possible, any material stored in dumps will</p>

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage of Rehabilitation	Southern Conservation Area	Sand Resource Conservation Area	Old Gravel Pit	Excavation Area
				<p>be respread.</p> <p>Larger vegetation and logs will be formed into occasional piles for habitat creation on the lower elevations.</p> <p>Vegetation materials are best stored on the excavated land from which they can readily be accessed for rehabilitation. That may lead to slightly more ground being required to be open at any one time.</p> <p>Excess and unusable timber will (with approval through the City of Busseton) be burnt and the ash used for soil amendments, to increase seed germination and nutrients; replicating natural vegetation – fire management interactions.</p>
Weed Treatment	<p>Any weeds likely to significantly impact on the rehabilitation will be sprayed with Roundup or other herbicide or grubbed out, depending on the species involved.</p> <p>Fusilade will be used where grasses present an impediment to rehabilitation.</p> <p><i>See Section 9.1 Weed Management.</i></p>	<p>Any weeds likely to significantly impact on the rehabilitation will be sprayed with Roundup or other herbicide or grubbed out, depending on the species involved.</p> <p>Fusilade will be used where grasses present an impediment to rehabilitation.</p> <p><i>See Section 9.1 Weed Management.</i></p>	<p>Any weeds likely to significantly impact on the rehabilitation will be sprayed with Roundup or other herbicide or grubbed out, depending on the species involved.</p> <p>Fusilade will be used where grasses present an impediment to rehabilitation.</p> <p><i>See Section 9.1 Weed Management.</i></p>	<p>Any weeds likely to significantly impact on the rehabilitation will be sprayed with Roundup or other herbicide or grubbed out, depending on the species involved.</p> <p>Fusilade will be used where grasses present an impediment to rehabilitation.</p> <p><i>See Section 9.1 Weed Management.</i></p>
Revegetation	<p>Revegetation will take place during the first winter months following the commencement of excavation.</p> <p>Revegetation will take place between the existing trees and shrubs and following treatment of exotic species.</p> <p>The species used will match the</p>	<p>Revegetation will take place during the first winter months following the commencement of excavation.</p> <p>Revegetation will take place between the existing trees and shrubs and following treatment of exotic species.</p> <p>Revegetation will consist of direct</p>	<p>Revegetation will take place during the first winter months following the commencement of excavation.</p> <p>Local species (<i>Agonis flexuosa</i>) <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i>, <i>Eucalyptus patens</i> <i>Banksia grandis</i> and understorey species are to be used in revegetation</p>	<p>Revegetation will take place during the first winter months following the availability of ground. Rehabilitation of Stage 1 will be commenced during the excavation of Stage 2.</p> <p>Revegetation will consist of direct transfer of topsoil, brushing with local native plants derived from clearing and as required</p>

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage of Rehabilitation	Southern Conservation Area	Sand Resource Conservation Area	Old Gravel Pit	Excavation Area
	<p>vegetation community into which the revegetation is being added.</p> <p>Local species <i>Agonis flexuosa</i>, <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i>, <i>Eucalyptus patens</i>, <i>Banksia attenuata</i>, <i>Banksia ilicifolia</i>, <i>Banksia grandis</i> and understorey species are to be used in revegetation because they are the favoured habitat of the Western Ringtail Possum and Black Cockatoos. These species will be added as tube plants in addition to seed.</p> <p>Tube plants of shrub species will also be used as required conducted in winter (June – August).</p> <p>To upgrade the vegetation tube plants will form the main source.</p> <p>Seeding will only be used in areas of bare soil.</p> <p>The planting rate is to achieve the completion criteria allowing for deaths to enable achievement of the Completion Criteria. The rates will vary depending on the local quality of the receiving vegetation.</p> <p>Any plant materials brought to the site will be dieback and weed free.</p> <p><i>Species lists are taken from Section 9.3, Table 9 and Stream Environment Water Report dated December 2018.</i></p>	<p>transfer of topsoil, brushing with local native plants derived from clearing of Stage 1 if available.</p> <p>Local species <i>Agonis flexuosa</i>, <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i>, <i>Eucalyptus patens</i>, <i>Banksia attenuata</i>, <i>Banksia ilicifolia</i>, <i>Banksia grandis</i> and understorey species are to be used in revegetation because they are the favoured habitat of the Western Ringtail Possum and Black Cockatoos. These species will be added as tube plants in addition to seed.</p> <p>Tube plants of shrub species will also be used as required conducted in winter (June – August). Seeding will take place in summer – autumn or spring.</p> <p>The planting rate and seeding is to achieve the completion criteria allowing for deaths to enable achievement of the Completion Criteria. The rates will vary depending on the local quality of the receiving vegetation.</p> <p>Seeds are to be spread, bulked up with moist vermiculite, and smoke treated where possible.</p> <p>Leguminous seeds are to be scarified.</p> <p>Any plant and seed materials brought to the site will be dieback and weed free.</p> <p><i>Species lists are taken from Section</i></p>	<p>because they are the favoured habitat of the Western Ringtail Possum and Black Cockatoos.</p> <p>These species will be added as tube plants in addition to seed.</p> <p>Tube plants of shrub species will also be used as required.</p> <p>Tube planting is to be conducted in winter (June – August). Seeding will take place in summer – autumn or spring.</p> <p>Tube plants are to be placed in low undulations and not on the high points of furrowed soil.</p> <p>The planting rate and seeding is to achieve the completion criteria allowing for deaths to enable achievement of the Completion Criteria.</p> <p>Seeds are to be spread, bulked up with moist vermiculite, and smoke treated where possible.</p> <p>Leguminous seeds are to be scarified.</p> <p>Any plant and seed materials brought to the site will be dieback and weed free.</p> <p><i>Species lists are taken from Section 9.3, Table 9 and Stream Environment Water Report dated December 2018.</i></p>	<p>trees/shrubs installed as tube plants and local provenance seed.</p> <p>Local species <i>Agonis flexuosa</i>, <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i>, <i>Eucalyptus patens</i>, <i>Banksia attenuata</i>, <i>Banksia ilicifolia</i>, <i>Banksia grandis</i> and understorey species are to be used in revegetation because they are the favoured habitat of the Western Ringtail Possum and Black Cockatoos. These species will be added as tube plants in addition to seed.</p> <p>Tube plants of shrub species will also be used as required.</p> <p>Tube planting is to be conducted in winter (June – August). Seeding will take place in summer – autumn or spring.</p> <p>Tube plants are to be placed in low undulations and not on the high points of furrowed soil.</p> <p>The planting rate and seeding is to achieve the completion criteria allowing for deaths to enable achievement of the Completion Criteria.</p> <p>Seeds are to be spread, bulked up with moist vermiculite, and smoke treated where possible.</p> <p>Leguminous seeds are to be scarified.</p> <p>Any plant and seed materials brought to the site will be dieback and weed free.</p> <p><i>Species lists are taken from Section 9.3, Table 9 and Stream Environment Water Report dated December 2018.</i></p>

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage of Rehabilitation	Southern Conservation Area	Sand Resource Conservation Area	Old Gravel Pit	Excavation Area
		9.3, Table 9 and Stream Environment Water Report dated December 2018.		
Completion Criteria	<p>No degradation in vegetation quality.</p> <p>Target vegetation Condition to be "Very Good" based on Keighery 1994 based on Baseline Sample Plots (Stream Environment and Water 2018) located in Vegetation of Very Good Condition; Sample Sites 1, 2, 3, and 13.</p> <p>Bare Ground < 20% average.</p> <p>Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.</p> <p>See the note about the species richness and plant density in the Peppermint-Sheoak Woodland (AgAfKg) and the presence of phytotoxins. See Section 3.4.3.</p>	<p>Species richness is 12 species /100 m².</p> <p>The plant density is 1 plant / m².</p> <p>Minimum 250 habitat tree species per hectare, <i>Eucalyptus</i>, <i>Agonis flexuosa</i>, <i>Nuytsia floribunda</i>, Providing weed treatment prior to revegetation and for 3 years following completion. and <i>Banksia</i> at 3 years.</p> <p>Target vegetation Condition to be "Good" based on Keighery 1994.</p> <p>< 20% bare ground assessed as vegetation cover.</p> <p>Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.</p> <p>See note about Peppermint-Sheoak Woodland (AgAfKg) and the presence of phytotoxins above.</p>	<p>Species richness is 12 species /100 m² for the revegetation of the gravel pit.</p> <p>The proposed plant density is 1 plant / m².</p> <p>Minimum 250 habitat tree species per hectare, <i>Eucalyptus</i>, <i>Agonis flexuosa</i>, <i>Nuytsia floribunda</i>, <i>Allocasuarina fraseriana</i> and <i>Banksia</i> at 3 years.</p> <p>Target vegetation Condition to be "Very Good" based on Keighery 1994 based on Baseline Sample Plots (Stream Environment and Water 2018) located in Vegetation of Very Good Condition; Sample Sites 1, 2, 3, and 13.</p> <p>< 20% bare ground assessed as vegetation cover.</p> <p>Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.</p>	<p>Species richness is 8 species /100 m².</p> <p>Plant density is 1 plant / m².</p> <p>Minimum 250 habitat tree species per hectare, <i>Eucalyptus</i>, <i>Agonis flexuosa</i>, <i>Nuytsia floribunda</i>, <i>Allocasuarina fraseriana</i> and <i>Banksia</i>, suitable as habitat for Ringtail Possum and Black cockatoos.</p> <p>Target vegetation Condition to be "Good" based on Keighery 1994.</p> <p>< 20% bare ground assessed as vegetation cover.</p> <p>Weed cover; not impacting revegetation, no Declared or "Environmental" weeds and weeds <10% of plant density.</p>
Monitoring	100 m ² sample plots as necessary in the Degraded to Good Vegetation Condition Areas, combined with annual field monitoring and photographic verification for 5 years until the completion criteria are met.	Four 100 m ² sample plots, combined with annual field monitoring and photographic verification for 5 years until the completion criteria are met.	One 100 m ² sample plot if there is sufficient ground, combined with annual field monitoring and photographic verification for 5 years until the completion criteria are met.	Four 100 m ² sample plots combined with annual field monitoring and photographic verification for 5 years until the completion criteria are met.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage of Rehabilitation	Southern Conservation Area	Sand Resource Conservation Area	Old Gravel Pit	Excavation Area
	<p><i>Agonis flexuosa</i> and <i>Allocasuarina fraseriana</i> produce phytotoxins to reduce competition from understorey and other trees and on site the plant density and species richness can be expected to occur naturally in Due to the release of plant phytotoxins of some species, Peppermint-Sheoak Woodland (AgAfKg) communities can appear "Degraded" when they are in fact in "Good" or better condition. The number of exotic species in addition to the species richness and plant density needs to be considered when making assessments. See Section 3.4.3.</p>			
Remediation	<p>If the Completion Criteria is not met or assessed as not likely to be met, additional tube planting and or seeding as required will be used as described above to increase the plant density and species richness and achieve the completion criteria.</p>	<p>If the Completion Criteria is not met or assessed as not likely to be met, additional tube planting and or seeding as required will be used as described above to increase the plant density and species richness and achieve the completion criteria.</p>	<p>If the Completion Criteria is not met or assessed as not likely to be met, additional tube planting and or seeding as required will be used as described above to increase the plant density and species richness and achieve the completion criteria.</p>	<p>If the Completion Criteria is not met or assessed as not likely to be met, additional tube planting and or seeding as required will be used as described above to increase the plant density and species richness and achieve the completion criteria.</p>

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Revegetation Management

The closing of the pit and rehabilitation of both the pit and the southern remnant vegetation, will be conducted as part of the excavation program.

As the mobile plant excavates the last sand from the floor of the pit the floor and batter slopes will be formed to the final contour and form. Those costs will therefore be part of the extraction costs.

On the other hand if the pit is not reformed correctly then there will be a potential cost to use a contractor to complete the work.

For revegetation, transfer of topsoil combined with the collection of seeds from ahead of clearing will be used to form a key component of the revegetation, combined with weed treatment.

Additional seeding and tube planting will be used as required.

The sources of funding will be from the proceeds of excavation for the owner operator.

In the event of failure of the sand pit being property closed, that will become apparent during the annual inspections by the City and the provisions of the Local Law.

The bond will be able to be used progressively by the City through a legal agreement that will be required by the City.

The City local law prevents future stages being opened before earlier stages are rehabilitated.

Table 6: Revegetation Management

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
Revegetation of Sand Excavation – 5 hectares in Stages of 2 + 2 + 1 hectares								
All commitments and management measures will be committed to.								
P1	Prior to and during clearing		During clearing recovered tree hollows recovered and relocated in the retained remnant vegetation. If the hollows are insufficient specific fauna tubes will be purchased and installed. Collection of local native seed.		Included in cost of clearing and excavation.		Contractor, consultant, through the landowner.	Operations Environment Management Plan 2.2, 2.2.1, 2.2.7, 3.1.5 and 4.1. Table 5.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
P2	Closure and formation of final land surface	Prior to winter Year 1	All non natural inert materials associated with quarrying that are not required for future use on Lot 75 will be collected and removed from site unless required for internal roads. Batter slopes at 1 : 4 vertical to horizontal and floor at 1 : 10 vertical to horizontal. Separation to the highest known water table of > 0.5 metres \$500 per ha.	\$500 per ha	\$ 2 500	Included in normal excavation	Contractor through the landowner.	Operations Environment Management Plan 2.2.5 and 3.1.5. Table 5.
P3	Respreading topsoil and vegetation fragments Included in normal excavation	Prior to winter Year 1		\$500 per ha	\$ 2 500	Included in normal excavation	Contractor through the landowner.	Operations Environment Management Plan 2.2.1, 2.2.2, 2.2.4, 2.2.5, 3.1.5 and 4.1. Table 5.
P4	Providing weed treatment prior to revegetation and for 3 years following completion.	Autumn Year 1	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds	\$200 per hectare	\$1 000	Treatment may require all weeds with a broad spray herbicide or Grass specific herbicide to manage pasture regrowth.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
P5	Provision of 0.5 kg mixed seed per hectare	Autumn Year 1	The Completion Criteria is to be met and maintained for 2 years.	\$800 per hectare	\$ 4 000		Landowner	Operations Environment Management Plan 3.1.5. Table 5.
P6	Planting a minimum of 400 tube plants per	Winter Year 1		\$1200 per hectare			Landowner	Operations Environment Management Plan

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
	hectare							3.1.5. Table 5.
P7	Weed monitoring and treatment as necessary	Autumn Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds	\$200 per hectare	\$1 000	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor - Consultant	Operations Environment Management Plan 3.1.4. Section 9.1.
P8	Review success of revegetation	Autumn Year 2	The Completion Criteria is to be met and maintained for 2 years.	\$200 per hectare	\$1 000		Consultant	Operations Environment Management Plan 3.1.5.
P9	Providing additional seed and tube plants if required	Winter Year 2		\$500 per hectare if required	\$2 500		Landowner	Operations Environment Management Plan 3.1.5. Table 5.
P10	Weed monitoring and treatment as necessary	Spring Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds	\$200 per hectare	\$1 000	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Table 5. Section 9.1.
P11	Weed monitoring and treatment as necessary	Autumn Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds	\$200 per hectare	\$1 000	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
P12	Review success of revegetation	Autumn Year 3	The Completion Criteria is to be met and maintained for 2 years.	\$200 per hectare	\$1 000		Contractor - Consultant	Operations Environment Management Plan 3.1.5. Table 5.
P13	Planting tube	Winter		\$300 per	\$1 500		Land Owner	Operations

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
	plants as necessary per hectare	Year 3		hectare if required				Environment Management Plan 2.2.7 and 3.1.5.
P14	Weed monitoring and treatment as necessary	Spring Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds	\$200 per hectare	\$1 000	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
P15	Weed monitoring and treatment. Monitoring of species richness and plant density against the Completion Criteria. Addition of tube plants and seed (if required) added. The management sequence is to be repeated until the Completion Criteria has been met for two years.	Years 4 and 5 and ongoing until Completion Criteria met.	Weed numbers and The Completion Criteria is to be met and maintained for 2 years.		\$5 000 if required		Contractor - Landowner	Operations Environment Management Plan 3.1.4. Section 9.1. Table 5.
Total Estimated Costs					\$25 000			
Restoration of Gravel Pit – 0.3 hectares								
All commitments and management measures will be committed to.								
G1	Closure and formation of final land surface	Prior to winter Year 1	Ripping of existing gravel floor if required.		\$500	Use normal excavation equipment	Contractor through the landowner.	Operations Environment Management Plan 2.2.5, 3.1.5 and 4.1.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
								Table 5.
G2	Respreding topsoil and vegetation fragments from perimeter.	Prior to winter Year 1			\$ 300	0.3 hectares only Topsoil and vegetation fragments will be spread.	Contractor through the landowner.	Operations Environment Management Plan 2.2.4, 2.2.5, 3.1.5 and 4.1. Table 5.
G3	Providing weed treatment prior to revegetation and for 3 years following completion.	Autumn Year 1	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may target all weeds with a broad spray herbicide or Grass specific herbicide to manage pasture regrowth. Treatment tied to other revegetation.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
G4	Provision of 0.5 kg mixed seed.	Autumn Year 1	The Completion Criteria is to be met and maintained for 2 years.		\$800			Operations Environment Management Plan 3.1.5. Table 5.
G5	Planting a minimum of 200 tube plants	Winter Year 1			\$600			Operations Environment Management Plan 3.1.5 and 4.1. Table 5.
G6	Weed monitoring and treatment as necessary	Autumn Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor - Consultant	Operations Environment Management Plan 3.1.4. Section 9.1.
G7	Review success of revegetation	Autumn Year 2	The Completion Criteria is to be met and maintained for 2 years.		\$200		Consultant	Operations Environment Management Plan 3.1.5. Table 5.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
G8	Providing additional seed and tube plants if required	Winter Year 2			\$300		Landowner	Operations Environment Management Plan 3.1.5. Table 5.
G9	Weed monitoring and treatment as necessary	Spring Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
G10	Weed monitoring and treatment as necessary	Autumn Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
G11	Review success of revegetation	Autumn Year 3	The Completion Criteria is to be met and maintained for 2 years.		\$200		Consultant	Operations Environment Management Plan 2.2.7 and 3.1.5. Table 5.
G12	Planting tube plants to lift the vegetation of any deficient areas.	Winter Year 3			\$200		Landowner	Operations Environment Management Plan 3.1.5. Table 5.
G13	Weed monitoring and treatment as necessary	Spring Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1. Table 5.
G14	Weed monitoring and treatment.	Years 4 and 5	Weed numbers and The Completion Criteria is to be		\$400		Contractor landowner	- -

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
	Monitoring of species richness and plant density against the Completion Criteria Addition of tube plants and seed as required) to improve deficient areas. The management sequence is to be repeated until the Completion Criteria has been met for two years.	ongoing until Completion Criteria met.	met and maintained for 2 years.				consultant	
Total Estimated Costs					\$4 000			
Protection of Southern 10.1 hectares of Remnant Vegetation								
All commitments and management measures will be committed to.								
C1	Provide Conservation Covenant		Conservation Covenant under the <i>Soil and Land Conservation Act 1945</i>		\$ 3 000		Landowner	Operations Environment Management Plan 2.2.7, 3.1.5 and 4.1. Table 5.
C2	Review vegetation condition and determine the additional planting and management to be applied.	Winter Year 1	No degradation to the vegetation on site. Improvements in vegetation quality because of weed management and control and additional revegetation.				Contractor - consultant	Operations Environment Management Plan 2.2.7 and 3.1.5. Table 5.
C3	Repair and maintain the	Year 1 following	Fence suitable for keeping stock out.		\$6 000		Contractor	Operations Environment

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
	perimeter fencing.	approval						Management Plan 2.2.5, 2.2.7 and 4.1.
C4	Construct the fire break to City of Busselton Requirements	Year 1 following approval	Fire breaks to be completed to City of Busselton specifications.		\$400	The fire break will be constructed by the excavation equipment on site.	Contractor	Operations Environment Management Plan 2.2.5, 2.2.7 and 4.1.
C5	Providing weed treatment prior to revegetation and for 3 years following completion.	Autumn Year 1	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds.		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.4. Section 9.1.
C6	Tube planting and or seeding to lift the quality of the degraded vegetation.	Tube planting Winter Year 1 Seeding spring summer Year 1.	Actions as per Table 5.				Contractor landowner consultant	
C7	Weed monitoring and treatment as necessary	Spring Year 1	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds.		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Operations Environment Management Plan 3.1.4.	Operations Environment Management Plan 3.1.4. Section 9.1.
C8	Maintain fire break		Fire breaks to be completed to City of Busselton specifications.		\$400	The fire break will be constructed by the excavation equipment on site.	Contractor	Operations Environment Management Plan 2.2.5 and 4.1.
C9	Repair and maintain the perimeter fencing.	Year 2			\$300		Contractor Landowner	Operations Environment Management Plan 4.1.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
C10	Weed monitoring and treatment as necessary	Autumn Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
C11	Tube planting and or seeding to lift the quality of the vegetation in deficient areas.	Tube planting Winter Seeding spring summer if required Year 2.	Actions as per Table 5.		\$2 000		Contractor landowner consultant	
C12	Weed monitoring and treatment as necessary	Spring Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
C13	Repair and maintain the perimeter fencing.	Year 3			\$300		Landowner contractor	Operations Environment Management Plan 2.2.5 and 4.1.
C14	Maintain fire break		Fire breaks to be completed to City of Busselton specifications.		\$400	The fire break will be constructed by the excavation equipment on site.	Contractor	Operations Environment Management Plan 4.1.
C15	Weed monitoring and treatment as necessary	Autumn Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
C16	Tube planting and or seeding as required to lift the	Tube planting Winter	Actions as per Table 5.		\$1 000		Contractor landowner consultant	

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
	quality of the vegetation.	Seeding spring summer if required. Year 3.						
C17	Weed monitoring and treatment as necessary	Spring Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
C18	Weed monitoring and treatment. Monitoring of species richness and plant density against the Completion Criteria. Addition of tube plants and seed (if required) to lift the vegetation quality of deficient areas. The management sequence is to be repeated until the Completion Criteria has been met for two years.	Years 4 and 5 and ongoing until Completion Criteria met.	Weed numbers and The Completion Criteria is to be met and maintained for 2 years.		Allow \$2,000		Contractor - landowner - consultant	
Total Estimated Costs					\$16 400			
Protection and upgrade of 2.9 hectares of Sand Resource Vegetation								
All commitments and management measures will be committed to.								
R1	Provide Conservation		Conservation Covenant under the <i>Soil and Land</i>		Included with the		Landowner	Operations Environment

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
	Covenant		<i>Conservation Act 1945</i>		southern remnant vegetation			Management Plan 2.2.7, 3.1.5 and 4.1. Table 5.
R2	Review vegetation condition and determine the additional planting and management to be applied.		Improvements in vegetation quality because of weed management and control				Contractor Consultant	Operations Environment Management Plan 2.2.7 and 3.1.5. Table 5.
R3	Provide perimeter fencing.		Fence suitable for keeping stock out.		\$3 000		Contractor	Operations Environment Management Plan 2.2.5, 2.2.7 and 4.1. Table 5.
R3	Providing weed treatment prior to revegetation and for 3 years following completion.	Autumn Year 1	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds.		\$400	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.4. Section 9.1. Table 5.
R4	Tube planting and or seeding as required to lift the quality of the vegetation.	Tube planting Winter Year 1 Seeding spring summer Year 1 .	Actions as per Table 5.		\$2 000		Contractor landowner consultant	
R5	Weed monitoring and treatment as necessary	Spring Year 1	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds.		\$300	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Operations Environment Management Plan 3.1.4.	Operations Environment Management Plan 3.1.4.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
								Section 9.1.
R6	Maintain the perimeter fencing.	Year 2						Operations Environment Management Plan 4.1.
R7	Weed monitoring and treatment as necessary	Autumn Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$200	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
R8	Tube planting and or seeding to lift the quality of the vegetation of deficient areas.	Tube planting Winter Seeding spring summer if required. Year 2.	Actions as per Table 5.		Allow \$2 000		Contractor Landowner -	
R9	Weed monitoring and treatment as necessary	Spring Year 2	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$200	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
R10	Maintain the perimeter fencing.	Year 3			Allow \$300		Contractor Landowner -	Operations Environment Management Plan 2.2.5 and 4.1.
R11	Weed monitoring and treatment as necessary	Autumn Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$300	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
R12	Tube planting and or seeding as	Tube planting	Actions as per Table 5.		Allow		Contractor -	

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Stage	Actions Monitoring	Timing	Commitments / Completion Criteria	Estimated Unit Cost	Total Estimated Cost	Comments	Responsibilities	References
	required to lift the quality of the vegetation.	Winter Seeding spring summer if required. Year 3.			\$1 000		Landowner	
R13	Weed monitoring and treatment as necessary	Spring Year 3	Weeds at numbers that do not impact revegetation. Absence of Declared Weeds		\$100	Treatment may involve grubbing out or herbicide. Cost will be minimal if carried out by landowner.	Contractor	Operations Environment Management Plan 3.1.4. Section 9.1.
R14	Weed monitoring and treatment. Monitoring of species richness and plant density against the Completion Criteria. Addition of tube plants and seed (if required) to lift the quality of deficient area. The management sequence is to be repeated until the Completion Criteria has been met for two years.	Years 4 and 5 and ongoing until Completion Criteria met.	Weed numbers and The Completion Criteria is to be met and maintained for 2 years.		Allow \$5 000		Contractor landowner consultant	
Total Estimated Costs					\$14 800			

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

7.0 MANAGED RISKS - REVEGETATION

The current environmental threats to the existing vegetation are those related to the current and past land uses.

Table 7: Risks Associated with Revegetation and Management

Environmental Threat to Revegetated and Managed Land	Description of Potential Impact	Risk After Management Applied				Comments on the Management and Risks to Revegetated and Managed Land	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
Rare							
Rehabilitation may not be undertaken	The rehabilitation may not be undertaken or may fail.	Moderate	Rare	LOW	High	<p>The requirement for rehabilitation is committed to in this Management Plan which will be provided to the City of Busselton to form part of the amended development approval and therefore will form part of the conditioned documentation if Development Approval is provided.</p> <p>Any Development Approval is a legally binding document and if the conditions are not carried out as required then the City is able to take action under the Town Planning Scheme to ensure that the conditions are completed as required.</p> <p>An Extractive Industries Licence will also be required from the City of Busselton and that will contain a performance bond in favour of the City which will enable the City to draw on the bond and complete any outstanding tasks such as rehabilitation.</p> <p>The sand extraction is to be staged and if the rehabilitation is not being undertaken progressively then the later Stages of the development can be withheld by the City.</p> <p>The revegetation of the resource area will be conditioned under Clearing Permit CPS 8863/1 which is issued under the <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i> and will be enforceable under the Regulations.</p> <p>The above controls apply to both the requirement to undertake the revegetation and also to any failure to reach the Completion Criteria.</p> <p>When the site is revegetated the amount of habitat suitable for Black Cockatoos and the Western Ringtail Possum will be</p>	Figure 6 shows the death of the <i>Banksia</i> in the west.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Environmental Threat to Revegetated and Managed Land	Description of Potential Impact	Risk After Management Applied				Comments on the Management and Risks to Revegetated and Managed Land	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
				LOW		<p>significantly increased over what is currently present.</p> <p><i>Agonis flexuosa</i> and <i>Allocasuarina fraseriana</i> produce phytotoxins to reduce competition from understorey and other trees and on site the plant density and species richness can be expected to occur naturally in Due to the release of plant phytotoxins of some species, Peppermint-Sheoak Woodland (AgAfKg) communities can appear "Degraded" when they are in fact in "Good" or better condition. The number of exotic species in addition to the species richness and plant density needs to be considered when making assessments. See Section 3.4.3.</p>	
The revegetation may be impacted by Dieback	<i>Phytophthora</i> if introduced or spread is likely to lead to reduction in the success of the revegetation	Moderate	Rare	LOW	High	<p>Dieback Management is proposed and is part of the management committed to. Being part of the management dieback management plan will be mandatory.</p> <p>Dieback principals will be used in all site activities and revegetation.</p>	<p>Figures 10 and 11.</p> <p>Development Application Section 7.1, Table 7 and Appendix D.</p> <p>Operations Environmental Management Plan – Sand Extraction 2019, Section 2.2.1.2 Clearance. Table 5.</p>
Threatened fauna may be impacted	Black Cockatoos Western Ringtail Possums and other fauna may be impacted by clearing and excavation	Minor	Unlikely	LOW	High	<p>A commitment is made to capture potentially impacted fauna prior to clearing.</p> <p>Black Cockatoos are highly mobile and will move away from clearing activities.</p> <p>A significant amount of habitat will be retained.</p> <p>The clearing and revegetation will be progressively staged.</p> <p>The vegetation at the completion of excavation and revegetation will be enhanced.</p>	

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Environmental Threat to Revegetated and Managed Land	Description of Potential Impact	Risk After Management Applied				Comments on the Management and Risks to Revegetated and Managed Land	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
Weeds May impact the re-vegetation	Weeds and naturalised plants may impact the potential for natural regeneration of the native vegetation.	Moderate	Unlikely	MODERATE	High	Weed Management is proposed and is part of the management plan committed to. Being part of the management dieback management will be mandatory. Weed Management principals will be used in all site activities and revegetation.	Stream Environment and Water, 2019, <i>Flora and Vegetation Assessment</i> . Section 9.1 and Table 5.
Risks to the Protection of the Southern Remnant Vegetation							
Vegetation will be impacted by grazing and other impacts	Grazing stock impact the vegetation	Moderate	Rare	LOW	High	The southern portion of Lot 75 has perimeter fencing in place and has not been grazed by the current owner. The fencing will be upgraded. Perimeter fire breaks will be installed. The whole 10.1 hectares will be protected by a Conservation Covenant.	Figures 11 - 13.
The Vegetation will be impacted by Dieback	<i>Phytophthora</i> if introduced or spread is likely to lead to continued decline of the remnant vegetation on the resource area.	Moderate	Rare	LOW	High	Dieback Management is proposed and is part of the management committed to. Being part of the management dieback management will be mandatory. Dieback principals will be used in all site activities and revegetation.	Figures 11 - 13. Development Application Section 7.1, Table 7 and Appendix D.
Weeds will impact the vegetation	Weeds and naturalised plants may spread onto the site or the existing weeds may spread and impact native vegetation.	Moderate	Unlikely	MODERATE	High	Weed Management is proposed and is part of the management committed to. Being part of the management dieback management will be mandatory. Weed Management principals will be used in all site management activities such as construction of fencing and provision and management of firebreaks. The invasive weed species such as <i>Zantedeschia aethiopia</i> , <i>Avena</i> spp and <i>Asparagus asparagoides</i> will be controlled. Fencing will reduce the risk of weed introductions.	Stream Environment and Water, 2019, <i>Flora and Vegetation Assessment</i> . Section 9.1 and Table 5.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Environmental Threat to Revegetated and Managed Land	Description of Potential Impact	Risk After Management Applied				Comments on the Management and Risks to Revegetated and Managed Land	References
		Consequence	Likelihood	Risk Rating	Data Certainty		
Firebreaks	Fire frequency may change.	Minor	Unlikely	LOW	High	There is not anticipated to be any change to fire frequency. The provision of fire breaks will assist in reducing the risk of wild fires by acting as a break and providing emergency access.	

Table 8: Risk Assessment Criteria (After DMIRS)

Level of Knowledge Certainty from DMIRS Statutory Guidelines

Descriptor	Explanation
Low	Risk rating is based on subjective opinion or relevant past experience. Baseline data/information has limitations, with only general conclusions possible and further work is required.
Medium	Risk rating is based on similar conditions being observed previously. Baseline data/information has some gaps or minor further work required.
High	Risk rating is based on testing, modelling or experiments. Baseline data/information is complete and analysis appropriate for level of data.

Likelihood Descriptors from DMIRS Statutory Guidelines

Descriptor	Frequency	Probability
Almost Certain	Twice or more per year	Event will occur during the Project / period under review.
		High number of known incidents.
Likely	Once per year	Event likely to occur during the Project / period under review.
		Regular incidents known.
Possible	Once in 5 years	Event may occur in some instances during the Project / period under review.
		Occasional incidents known.
Unlikely	Once in 10 years	Event is not likely to occur during the Project / period under review.
		Some occurrences known.
Rare	Once in 20 years	Event will occur in exceptional circumstances during the Project / period under review.
		Very few or no known occurrences.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Consequence Descriptors from DMIRS Statutory Guidelines

Factor	Insignificant	Minor	Moderate	Major	Severe
Biodiversity	Alteration or disturbance to an isolated area with no effect on habitat or ecosystem. Loss of an individual plant / animal of conservation significance.	Alteration or disturbance to <10% of a habitat or ecosystem resulting in a recoverable impact within 2 years. Loss of multiple plants / animals of conservation significance.	Alteration or disturbance to 10- 40% of a habitat or ecosystem resulting in a recoverable impact within 2-5 years. Loss of <50% known local population of plant / animal of conservation significance.	Alteration or disturbance to 40- 70% of a habitat or ecosystem resulting in a recoverable impact within 5-15 years. Loss of >50% known local population of plant / animal species with possible loss of entire local population.	Alteration or disturbance to >70% of a habitat or ecosystem resulting in a recoverable impact >15 years. Local loss of conservation significant or listed species. Extinction of a species.
Water Resources	Negligible change to hydrological processes, water availability or water quality.	Short-term modification of hydrological processes, water availability and quality within project tenure, but no change in beneficial use.	Medium-term modification of hydrological processes, water availability and water quality within project tenure, but no change in beneficial use. Short-term modification of hydrological processes, water availability and water quality outside project tenure, but no change in beneficial use.	Long-term modification of hydrological processes, water availability and water quality within project tenure, but no change in beneficial use. Medium-term modification of hydrological processes, water availability and water quality outside project tenure, with change in beneficial use	Long-term or permanent modification of hydrological processes, water availability or water quality outside project tenure, with impacts to a water-dependent environmental value and/or change in beneficial use.
Land and Soils	Clean-up by site personnel, rectified immediately. Confined to immediate area around source.	Clean-up by site personnel, remediation within 1 year. Confined to operational area.	Clean-up by site personnel, remediation within 1-3 years. Minor impact outside disturbance envelope or minor impact to soil stockpiles.	Clean-up requiring external specialist, remediation within 3-10 years. Impact has migrated outside the disturbance envelope or contamination of soil stockpiles.	Clean-up requiring external specialist. Remediation >10 years, or permanent residual impact. Impact outside the tenement boundary.
Rehabilitation and Mine Closure	Site is safe, stable a non-polluting. Post mining land use is not adversely affected.	Site is safe, all major landforms are stable, and any stability or pollution issues are contained and require no residual management. Post mining land use is not adversely affected.	Site is safe, and any stability or pollution issues require minor, ongoing maintenance by end land-user. Post mining land use cannot proceed without some management.	Site cannot be considered safe, stable or non-polluting without long-term management or intervention. Post mining land use cannot proceed without ongoing management.	Site is unsafe, unstable and/or causing pollution or contamination that will cause an ongoing residual affect. Post mining land use cannot be achieved.

Rehabilitation Management - Proposed Sand Excavation, CPS 8863/1 - Lot 75 Haag Road, Yelverton

Modified Acceptability of Risk Level from DMIRS Statutory Guidelines

Risk Level	Acceptability	Treatment
Very High	Unacceptable	Risk will not be tolerated. Modification of activity required and Mining Proposal amended.
High	May be acceptable, with specific risk treatments	Risk may be tolerated with application of high reliability risk treatments. Environmental outcome / Closure objective required.
Moderate	Acceptable, with relevant risk treatments	Risk is tolerable with application of appropriate risk treatments. Environmental outcome / Closure objective required.
Low	Acceptable	Risk is acceptable, but still requires industry best practice environmental management.

8.0 WEED AND DIEBACK MANAGEMENT

8.1 Weed Management Plan

Baseline Weed Status

Weed management is to be used to minimise impact on adjoining remnant vegetation and on adjoining properties as well as maintaining the agricultural capability of the rural lot.

The sand excavator owns Lot 75. It is therefore in their interests to efficiently and correctly rehabilitate the excavated area and minimise weed impacts.

The management of weeds is essentially similar to that for plant diseases. The impact of weeds is really the impact within the local area and the more they are controlled the better. It is desirable that the site does not become a haven for environmental weeds and therefore a management and control program is warranted at all sites.

Weeds can be declared under the *Agriculture and Related Resources Protection Act 1976* which requires that Declared Weeds are eradicated. Other weeds are not Declared but may be classified as Environmental Weeds because they are well known for impacting on vegetation.

Thirteen of the 108 taxa are introduced. An additional 11 species (including 4 introduced species) were recorded in the previous survey by Ecological Environmental Services (2013) but were not recorded during the current project.

Two of the thirteen introduced flora species recorded during the survey, are listed as declared pest plants under the Biosecurity and Agriculture Management Act (2007), *Asparagus asparagoides* (bridal creeper) and *Zantedeschia aethiopica* (Arum lily) although Stream Environmental and Water did not map the weed species for this project.

(Operations Environmental Management Plan (Sand Extraction) 2019, Section 2.2.5.1 Earthworks, and Section 3.1.3, Site Drainage, Water Quality and Sediment Control)

The main sources of weeds are;

- Seeds from exotic plants already on site or nearby.
- Spread of existing weeds and pasture species.
- Weeds from edge effects from access and local roads.
- Gradual creep of weeds along access roads.
- Rubbish dumped by the public. This is not likely as the resource is set well back from Haag Road.
- Materials or waste brought to site by employees.
- Soil and seeds from vehicles arriving at site. This often applies to trucks that have carried something else such as grain, or vehicles to be used in earthworks.
- Wind blown seed from surrounding land.
- Birds and other vectors. This is more common than is often given credit for. eg *Solanum* species.

Weed Management

- Weed Management will integrate with normal farm weed management.
- Inspections are to be conducted to monitor the presence and introduction of Environmental and Declared Weeds on an annual or more frequent basis. On identification, Declared and significant environmental weeds will either be removed, buried, or sprayed with a herbicide.
- *Asparagus asparagoides* (bridal creeper) and *Zantedeschia aethiopica* (Arum lily) are to be targeted with specific mechanical and spot spray treatment to try and eliminate the species.
- Any pasture (grass) weeds likely to significantly impact on the rehabilitation will be sprayed with Roundup or other herbicide or grubbed out, depending on the species involved. Fusilade will be used where grasses present an impediment to rehabilitation.
- All vehicles and equipment to be used during land clearing or land reinstatement, are to be clean and free from soil or plant material when arriving at site.
- No soil and vegetation will be brought to the site apart from that to be used in rehabilitation.
- Plants to be used in rehabilitation are to be free from weeds.

Rehabilitation Management - Proposed Sand Excavation, Lot 75 Haag Road, Yelverton

- Weed affected top soils may need to be taken offsite or will be treated to minimise or mitigate weed spread.
- Illegally dumped rubbish is the major source of weeds and will be removed promptly.
- No weed contaminated or suspect soil or plant material is to be brought onto the site.
- When clearing land or firebreaks vehicles will work in conjunction with dieback principles and push from areas of better vegetation towards areas of lower quality vegetation.
- Weeds are to be sprayed with broad spectrum spray prior to planting or seeding in weed affected soils as required.

Monitoring and Control

- Review of revegetated areas, annually in Spring – Autumn to determine if there are weeds that are impacting on the success of revegetation.
- Apply additional weed control in the remnant vegetation, which will include more frequent treatment and monitoring until the weeds are controlled.
- In pasture provide weed treatment which will be taken over by normal agricultural practices once the pasture is established
- Ongoing monitoring and treatment twice yearly.
- In addition; monitor prior to revegetation activities and for a minimum of 3 years post revegetation
- The Weed Management Plan will be implemented.

8.2 Dieback Management Plan

Quarantine and Dieback Management is provided in the *Development Application (Sand Extraction) 2019 – Social Impact Assessment provided to the City of Busselton in support of the Application, Section 3.5.*

Dieback of vegetation is often attributed to *Phytophthora cinamomi* even though there are other *Phytophthora* species and other diseases such as *Armillaria* that can cause dieback like symptoms. Microscopic soil-borne fungi of the genus *Phytophthora* kill a wide range of native plants and can cause severe damage to many vegetation types, particularly those from the families Proteaceae, Epacridaceae, Xanthorrhoeaceae and Myrtaceae.

There are several guides to the management of Dieback.

- *Department of Biodiversity Conservation and Attractions Phytophthora Dieback Management Manual, Forest and Ecosystem Management , October 2017.*
- *Department of Biodiversity Conservation and Attractions Phytophthora Dieback Management Plan, October 2017.*
- *Dieback Working Group 2005, Management of Phytophthora Dieback in Extractive Industries.*
- *Dieback Working Group, 2000, Managing Phytophthora Dieback, Guidelines for Local Government.*

Phytophthora cinamomi is commonly present in the higher rainfall zones of the south west of WA but occurs in wetter parts of the zone with rainfall of 400 mm or even slightly lower. And is certainly present at some locations in the nearby areas. Dieback diseases are more likely to be transported under moist soil conditions

It is unclear whether dieback is present. Some susceptible species on site have died, but these could be due to changed soil water regimes, decreased rainfall, plant diseases or plant age. Testing did not reveal the presence of dieback.

The sand pit is likely classified as "Not Interpretable" with respect to dieback because of the significant existing levels of disturbance.

On the other hand DBCA has determined that material such as sand, taken from deeper in the regolith profile where there is no organic and other plant matter, carries low risk of spreading dieback. (DEC/DWER 2004).

(Operations Environmental Management Plan (Sand Extraction) 2019, Section 3.1.4, Quarantine). The responsibilities and applications are listed.

Management of Dieback Risk

- *DBCA 2017 and Dieback Working Group 2005, Guidelines will be followed.*

Rehabilitation Management - Proposed Sand Excavation, Lot 75 Haag Road, Yelverton

- Vehicles are to be prohibited from entering vegetation ahead of excavation, apart from normal travel along made firebreaks and roads for normal security and maintenance activities.
- A split operation will be worked where practicable, where the road transport vehicles only access one side of the stockpile or processing area and excavation vehicles operate on the other side of the stockpiles and processing, reducing the risk of contamination from road transport.
- All vehicles and equipment used during land clearing or land reinstatement, will be clean and free from soil or plant material when arriving at site.
- When removing topsoil and clearing, vehicles will run around the perimeter and then push inwards where possible.
- Remnant vegetation ahead of the stage to be excavated is proposed to be quarantined where possible to minimise vehicles from entering, through reduced tracks, signage, site marking and or fencing as appropriate.
- No soil and vegetation is to be brought to the site apart from that to be used in rehabilitation and that which is dieback free.
- Plants to be used in rehabilitation are to be certified as from dieback free sources.
- Rehabilitated surfaces will be free draining and not contain wet or waterlogged conditions.
- Illegally dumped rubbish is to be removed promptly.
- When clearing land or firebreaks vehicles are to work from disturbed areas towards the pit; or, in situations where dieback interpretation is not possible, from areas of higher quality vegetation to areas of lower quality vegetation.
- Roads are to be maintained as free draining and hard surfaced.
- Quarry traffic will be restricted to the designated access roads, pit and stockpile areas apart from clearing land and maintaining fire breaks.

8.3 Suggested Species List for Revegetation

Species list taken from *Stream Environment and Water, 2018, Flora and Vegetation Assessment*.

Table 9: Species List for Revegetation

Family	Genus	Species	Seed	Tube Plants and or Seed	Comment
Anarthriaceae	Anarthria	prolifera			
	Lyginia	barbata			
Apiaceae	Xanthosia	candida			
Asparagaceae	Lomandra	micrantha			
	Lomandra	nigricans			
	Lomandra	sp.			
	Sowerbaea	laxiflora			
Asteraceae	Thysanotus	manglesianus			
	Ptilotus	manglesii			
	Lagenophera	huegelii			
	Rhodanthe	citrina			
Casuarinaceae	Allocasuarina	fraseriana	x	x	
Colchicaceae	Burchardia	congesta			Wet sites
Cyperaceae	Baumea	vaginalis			Wet sites
	Lepidosperma	leptostachyum			Wet sites
	Lepidosperma	pubisquamatum			
	Lepidosperma	squamatum			
	Mesomelaena	tetragona			
	Tetraria	capillaris			
Dasypogonaceae	Tetraria	octandra			
	Dasypogon	bromeliifolius			
	Kingia	australis			
Dilleniaceae	Hibbertia	acerosa			
	Hibbertia	ferruginea			
	Hibbertia	hypericoides	x		

Rehabilitation Management - Proposed Sand Excavation, Lot 75 Haag Road, Yelverton

	Hibbertia	notibractea		
	Hibbertia	racemosa	x	
Ericaceae	Leucopogon	australis		
	Leucopogon	capitellatus		
Fabaceae	Acacia	divergens	x	x
	Acacia	pulchella	x	x
	Chorizema	rhombeum	x	x
	Hovea	chorizemifolia	x	x
	Hovea	pungens	x	x
	Isotropis	cuneifolia		
	Jacksonia	furcellata	x	x
	Mirbelia	dilitata	x	x
Goodeniaceae	Dampiera	linearis		
	Scaevola	calliptera		
Haemodoraceae	Anigozanthus	spp.		x
	Conostylis	setosa		
	Haemodoraceae	sp.		
Iridaceae	Patersonia	occidentalis		
Lauraceae	Cassytha	sp.		
Loranthaceae	Nyctia	floribunda		
Myrtaceae	Agonis	flexuosa	x	x
	Astartea	fascicularis	x	x
	Corymbia	calophylla	x	x
	Eucalyptus	marginata	x	x
	Eucalyptus	patens	x	x
	Homalospermum	firmum		
	Hypocalymma	angustifolium		x
	Hypocalymma	robustum		x
	Kunzea	glabrescens	x	x
	Kunzea	recurva	x	x
	Melaleuca	systema	x	x
	Taxandria	parviceps	x	x
				Wet sites
Pittosporaceae	Billardiera	variifolia		
Podocarpaceae	Podocarpus	drouynianus		
Proteaceae	Banksia	attenuata	x	x
	Banksia	grandis	x	x
	Banksia	ilicifolia	x	x
	Hakea	amplexicaulis	x	x
	Xylomelum	occidentale	x	x
Restionaceae	Desmocladius	fasciculatus		x
	Desmocladius	flexuosus		x
	Hypolaena	exsulca		
	Loxocarya	cinerea		
Rubiaceae	Opercularia	echinocephala		
	Opercularia	hispidula		
Xanthorrhoeaceae	Chamaescilla	corymbosa		
	Xanthorrhoea	gracilis		
	Xanthorrhoea	preissii	x	
Zamiaceae	Macrozamia	riedlei	x	

REFERENCES – READING

- *Department of Biodiversity Conservation and Attractions Phytophthora Dieback Management Manual, Forest and Ecosystem Management , October 2017.*
- *Department of Biodiversity Conservation and Attractions Phytophthora Dieback Management Plan, October 2017.*
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Targeted Fauna Assessment

Lot 75 Haag Road Yelverton

AUGUST 2019
Version 1

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TABLE OF CONTENTS

1.	INTRODUCTION	1
2.	SCOPE OF WORKS.....	1
3.	METHODS	1
3.1	SITE SURVEYS.....	1
3.1.1	Habitat Assessment.....	1
3.1.2	Western Ringtail Possum Assessment.....	2
3.1.3	Black Cockatoo Habitat Assessment.....	2
4.	SURVEY CONSTRAINTS	3
5.	RESULTS	3
5.1	SITE SURVEYS.....	3
5.1.1	Habitat Assessment.....	3
5.1.2	Western Ringtail Possum Assessment.....	4
5.1.3	Black Cockatoo Habitat Assessment.....	4
6.	CONCLUSION	5

FIGURES

FIGURE 1:	Study Area & Surrounds
FIGURE 2:	Study Area - Air Photo
FIGURE 3:	Habitat Trees

PLATES

- PLATE 1: Open Forest of Jarrah, Sheoak, Banksia and Peppermint – north west section of proposal area.
- PLATE 2: Open Forest of Banksia, Sheoak, Jarrah and Peppermint over an Open Shrubland/Scattered shrubs over a Herbland – central eastern side of proposal area.
- PLATE 3: Open Forest of Sheoak, Banksia and Peppermint over an Open Herbland and Open Grassland – central western side of proposal area.

APPENDICES

- APPENDIX A: Habitat Tree Details

1. INTRODUCTION

This report details the results of targeted fauna survey/habitat assessment (western ringtail possums (WRP) and black cockatoos) of Lot 75 Haag Road, Yelverton (the study site). The site is located about 13 km south of the Dunsborough in south west Western Australia and is centred at approximately 33.727385°S and 115.138296°E (Figure 1).

It is understood that about 11.5 hectares of Lot 75 is being targeted for sand extraction and that the clearing of some of the native vegetation, which covers part of this total area, will be required if the project is proceed in its current form.

An application to clear the vegetation is currently being prepared for submission to the Department of Water and Environment Regulation (DWER). The information presented here will be submitted to DWER for their consideration during the application assessment process.

2. SCOPE OF WORKS

The scope of works was:

- Undertake a targeted survey of the site for western ringtail possums and black cockatoos and their habitat; and
- Report summarising methods and results.

Note: For the purposes of this report the term black cockatoo is in reference to Baudin's black cockatoo *Calyptorhynchus baudinii*, Carnaby's black cockatoo *Calyptorhynchus latirostris* and the forest red-tailed black cockatoo *Calyptorhynchus banksii naso*.

3. METHODS

3.1 SITE SURVEYS

Daytime field survey work at the proposed clearing area was carried out by Greg Harewood on the 5 August 2019. The nocturnal WRP survey was carried out on the 6 August 2019.

3.1.1 Habitat Assessment

The vegetation units present have been used to define broad fauna habitat types across the study site.

3.1.2 Western Ringtail Possum Assessment

To determine if western ringtail possums were utilising the study area the following was carried out:

- Daytime survey of the study site searching for dreys, obvious tree hollows (and other potential daytime refuge habitat), scats and individual WRPs;
- One night time survey to locate and record the distribution and abundance of WRPs; and
- Determination of the amount and quality of WRP habitat within the study area.

3.1.3 Black Cockatoo Habitat Assessment

The black cockatoo habitat assessment has included a:

- Habitat tree survey: This involved the identification of all suitable tree species within the study site that have a diameter at breast height (DBH) of over 50cm (irrespective of the presence/absence of suitable hollows – DotEE/DBCA criteria). The location of each tree identified was recorded with a GPS and details on tree species, number and size of hollows (if any) noted.

Target tree species included tuart, marri and jarrah or any other suitable *Corymbia/Eucalyptus* species of a suitable size that may be present. Peppermints, *Banksia*, Sheoak and *Melaleuca* tree species (for example) were not assessed as they typically do not develop hollows that are used by black cockatoos.

For the purposes of this study a potential cockatoo nest hollow was defined as:

Generally, any tree which is alive or dead that contains one or more visible or possible hollows (cavities within the trunk or branches) suitable for occupation by any of the three black cockatoo species for the purpose of nesting/breeding. Hollows that had an entrance greater than about 10cm in diameter and would allow the entry of a cockatoo (white tailed or red-tailed) into a suitably orientated and sized branch/trunk, were recorded as a "potential nest hollow".

Identified hollows (if any) were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). Trees with possible nest hollows were also scratched and raked with a large stick/pole to flush any sitting birds from hollows and calls of chicks were also listened for.

- Black cockatoo foraging assessment: The location and nature of black cockatoo foraging evidence observed (e.g. chewed fruits around base of trees) during the field survey was recorded.
- Roosting habitat survey: Direct and indirect evidence of black cockatoos roosting within trees on site was noted if observed (e.g. branch clippings, droppings or moulted feathers).

4. SURVEY CONSTRAINTS

No seasonal sampling has been carried out as part of this fauna assessment. The conclusions presented are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of the field assessments. It should also be recognised that site conditions can change with time.

During the western ringtail possum assessment and the black cockatoo habitat survey, trees with hollows were recorded. It should be noted that identifying hollows suitable for fauna species from ground level has limitations. Generally the full characteristics of any hollow seen are not fully evident (e.g. internal dimensions). It is also difficult to locate all hollows within all trees as some are not observable from ground level.

The location of habitat trees was recorded using a handheld GPS. The accuracy of the GPS cannot be guaranteed above a level of about 5 to 10 metres, though it should be noted that in some circumstance the accuracy can be worse or better than this.

5. RESULTS

5.1 SITE SURVEYS

5.1.1 Habitat Assessment

The vegetation present within the proposed clearing area consists of various densities of predominately sheoak (*Allocasuarina fraseriana*), candlestick banksia (*Banksia attenuata*), holly-leaved banksia (*B. ilicifolia*), peppermint (*Agonis flexuosa*), WA christmas tree (*Nuytsia floribunda*) and woody pear (*Xylomelon occidentale*) forming a low open forest or woodland with scattered emergent jarrah (*Eucalyptus marginata*) over a generally sparse low open shrubland. Plates 1 to 3 illustrate the nature of some of the vegetation units/habitats present within the study area.

5.1.2 Western Ringtail Possum Assessment

No evidence of western ringtail possums utilising vegetation with the study site was observed during the day or night surveys. The results suggest that WRPs are either completely absent from the study site or present in such low numbers that they avoided detection.

Superficially, almost all of the native vegetation present with the subject site appears to be suitable for western ringtail possum habitat though its relative quality would vary depending on plant species composition and overall density at any one point.

From a foraging perspective WRPs are known to utilise peppermint, sheoak, jarrah, and the WA christmas tree as a food source. All these species are present throughout the subject site.

Canopy connectivity varies within the areas of remnant vegetation with some areas having significant gaps between trees. This is particularly evident in the central west section of the subject site (see Figure 2).

5.1.3 Black Cockatoo Habitat Assessment

The habitat tree assessment identified a total of 12 trees with a DBH of >50cms within the study site (Figure 3).

Of the 12 trees recorded, six appeared to contain hollows or possible hollows with entrances of various sizes. None of these trees were assessed by the Author at the time of the survey as currently being suitable for black cockatoos to use for nesting purposes. This assessment was primarily based on the fact that the hollows appeared to be two shallow or small.

Additional details on each habitat tree observed can be found in Appendix A.

Almost all of the remnant vegetation within Lot 75 represents a foraging resource for one or more of the three black cockatoo species known to frequent the area give the presence of banksia, sheoak, marri and jarrah. Evidence of actual foraging was found during the day time survey in the form of chewed banksia cones (attributed to Carnaby's or Baudin's) and chewed sheoak fruits (attributed to Carnaby's or the FRTBC).

No existing roosting trees (trees used at night by black cockatoos to rest) were identified during the survey period.

6. CONCLUSION

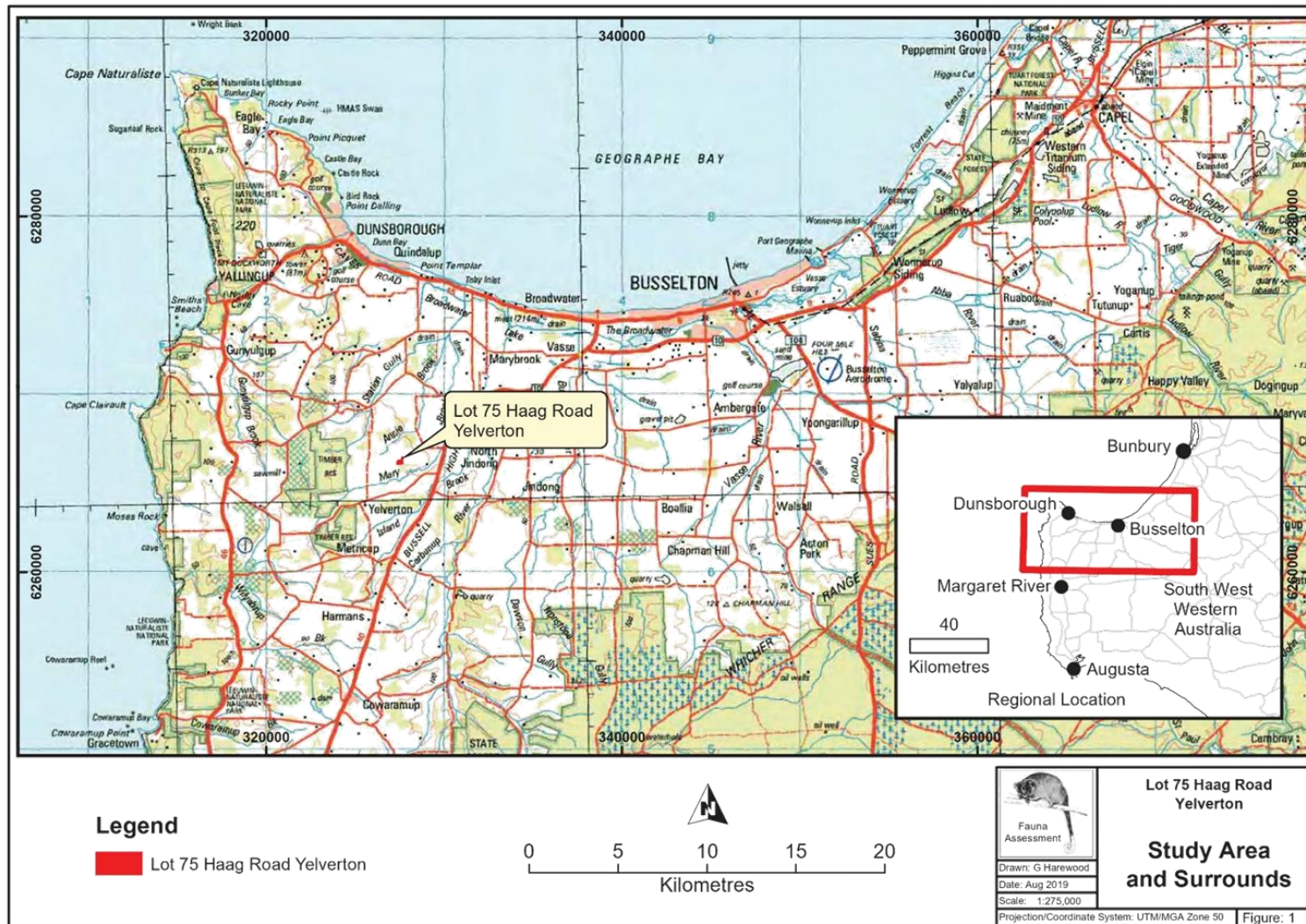
The targeted survey was carried out primarily to determine if western ringtail possums were utilising the proposed clearing area and to determine the extent of black cockatoo habitat present.

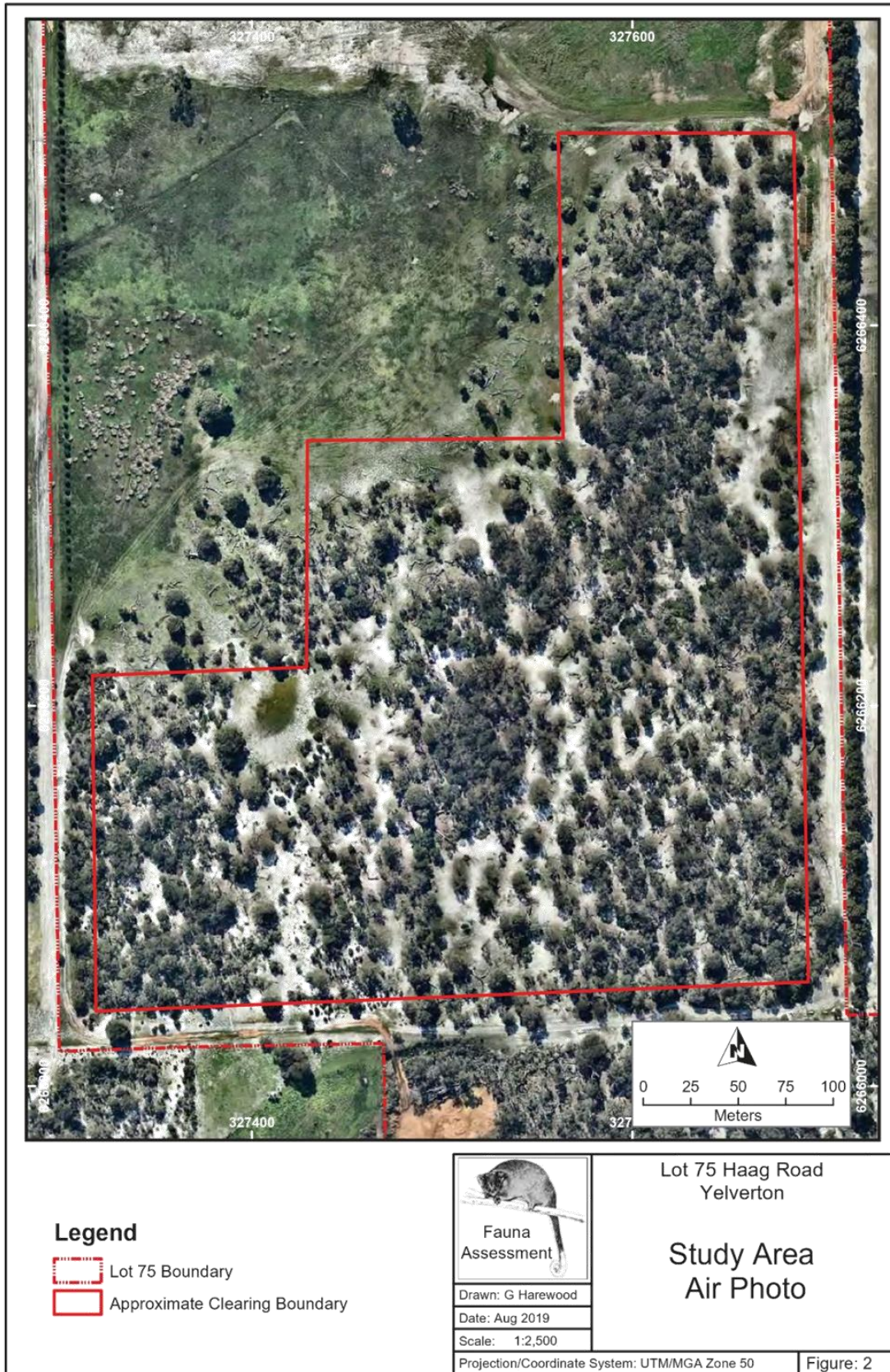
No evidence of the presence of western ringtail possums was observed despite the presence of apparently suitable habitat in some areas.

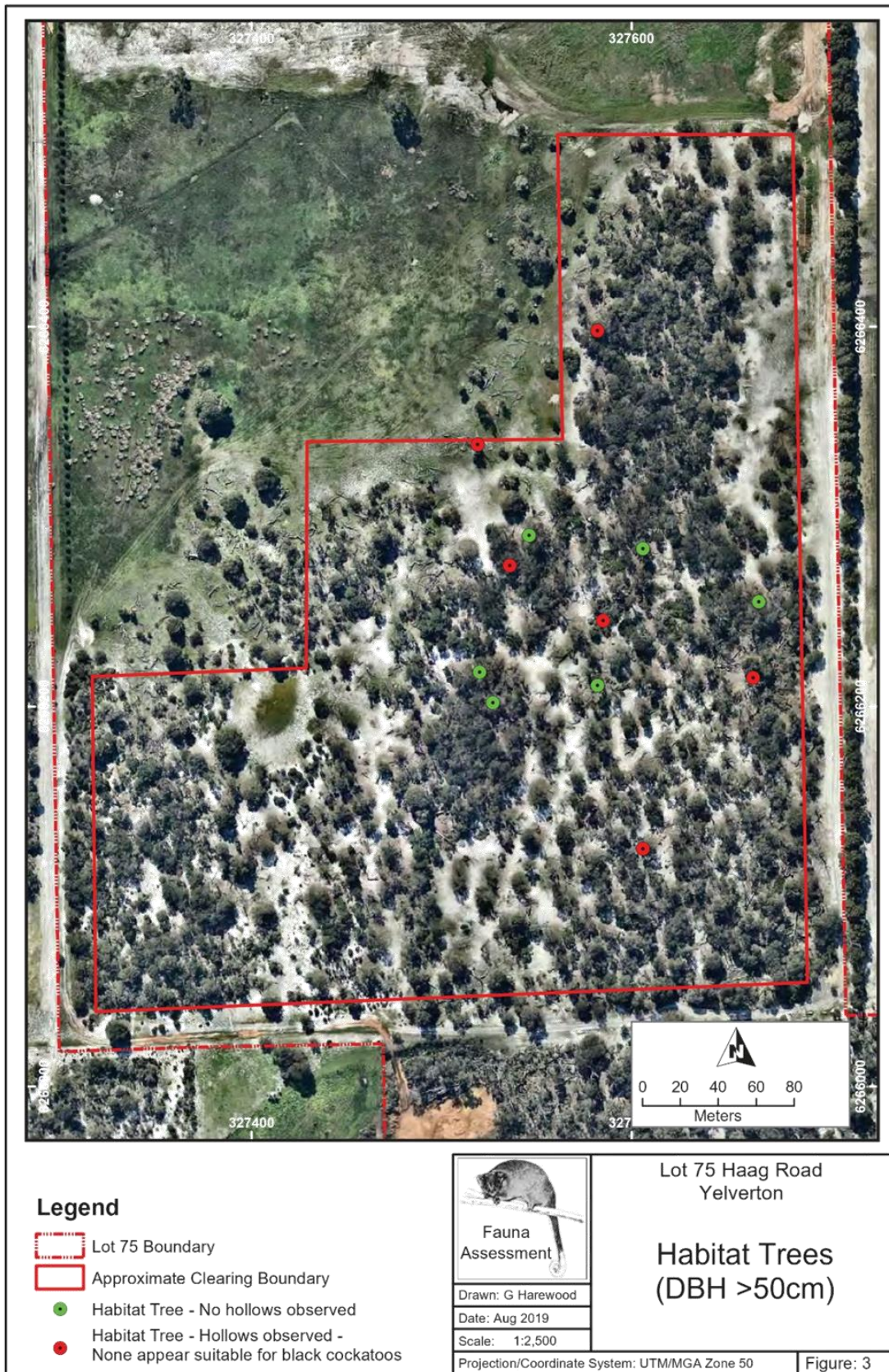
The larger (DBH >50cm) trees present, while limited in number are represent potential breeding habitat for black cockatoos though none appeared to currently contains hollows suitable for this purpose. Most of the remnant vegetation within the proposed works footprint represents potential foraging habitat for black cockatoos given the presence of banksia, sheoak and jarrah. Evidence of foraging on sheoak and banksia by black cockatoos was observed. It is considered unlikely that black cockatoos roost within the area surveyed and no evidence of this activity was seen.

This report should be provided to DWER for their consideration.

FIGURES







PLATES

LOT 75 HAAG ROAD – YELVERTON – TARGETED FAUNA ASSESSMENT – AUGUST 2019 – V1



Plate 1: Open Forest of Jarrah, Sheoak, Banksia and Peppermint over an Open Herbland – north east section of proposal area.



Plate 2: Open Forest of Banksia, Sheoak, Jarrah and Peppermint over an Open Shrubland/Scattered shrubs over a Herbland – central eastern side of proposal area.

LOT 75 HAAG ROAD – YELVERTON – TARGETED FAUNA ASSESSMENT – AUGUST 2019 – V1



Plate 3: Open Forest of Sheoak, Banksia and Peppermint over an Open Herbland and Open Grassland – central western side of proposal area.

APPENDIX A

HABITAT TREE DETAILS

Habitat Trees
DBH >50cm
Datum - GDA94

Entrance Size Ranges - Small = >5cm, Medium = 5, 10cm, Large = >10cm

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimates Hollow entrance size range	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt021	50H	327667	6266255	Jarrah	15-20	>50	0				No	
wpt047	50H	327582	6266211	Jarrah	15-20	>50	0				No	
wpt048	50H	327585	6266245	Dead Jarrah	15-20	>50	2	Small-Medium	No Signs	No Signs	No	Depth of hollows unknown
wpt050	50H	327520	6266218	Jarrah	15-20	>50	0				No	
wpt055	50H	327606	6266283	Jarrah	15-20	>50	0				No	
wpt056	50H	327519	6266338	Jarrah	15-20	>50	5+	Small-Large	Bees	No Signs	No	Hollow too shallow/small
wpt057	50H	327582	6266398	Jarrah	15-20	>50	1	Small	No Signs	No Signs	No	Depth of hollows unknown
wpt024	50H	327664	6266215	Jarrah	15-20	>50	3	Small-Medium	No Signs	No Signs	No	Depth of hollows unknown
wpt032	50H	327606	6266125	Dead Unknown	20+	>50	5+	Small-Large	No Signs	No Signs	No	Hollows too shallow/small
wpt049	50H	327527	6266202	Jarrah	15-20	>50	0				No	
wpt053	50H	327536	6266274	Jarrah	20+	>50	3	Small-Medium	No Signs	No Signs	No	Depth of hollows unknown
wpt054	50H	327546	6266290	Jarrah	15-20	>50	0				No	

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Stream Environment and Water

Flora and vegetation assessment, Lot 75 Haag Road
Yelverton

SURVEY OF PROPOSED SAND EXTRACTION AREAS
DECEMBER, 2018

PREPARED FOR: THREADGOLD ARCHITECTURE



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Contents

1	Introduction	3
1.1	Scope and Objectives	3
1.2	Site location and details	3
2	Background information	5
2.1	Soils and landforms	5
2.2	Vegetation	5
2.3	Threatened Ecological Communities	9
2.4	Threatened and priority flora	9
3	Survey Methods	11
3.1	Desktop Survey	11
3.2	Field Survey	11
3.3	Survey Limitations	12
4	Results	14
4.1	Desktop survey	14
4.1.1	Potential threatened communities and species	14
4.2	Field Survey	17
4.2.1	Flora	17
4.2.2	Vegetation communities	18
5	Discussion and conclusions	24
6	References	26
	Appendix A: Categories and definitions for threatened ecological communities	28
	Appendix B: Categories and definitions for threatened and priority flora species	30
	Appendix C: Protected Matters database search results	32
	Appendix D: Nature Map database search results (threatened species)	43
	Appendix E: Vascular plants species recorded for survey area	44

1 Introduction

1.1 Scope and Objectives

Stream Environment and Water Pty Ltd (Stream Environment and Water) were commissioned by Threadgold Architecture Pty Ltd to undertake a flora and vegetation survey of Lot 75, Haag Road Yelverton. Threadgold Architecture Pty Ltd propose to clear part of Lot 75 for the purposes of sand extraction. Focused Vision Consulting Pty Ltd were also engaged to provide specialist botanical taxonomic and field support given the potential occurrence of threatened orchid species.

The scope of the survey was to complete a flora and vegetation survey of 24ha on Lot 75. The broad objective of the survey was to provide information to support application for a clearing permit for the proposed development area. In doing so, the survey was designed and undertaken to identify whether any Matters of National Environmental Significance (as listed under the Commonwealth Environmental Protection and Biodiversity Conservation (EPBC) Act 1999) or State listed (Wildlife Conservation Act 1950) threatened species or communities are present within the survey area. Further details on the approach taken to meet the scope and objectives are provided in section 3 (Methods).

1.2 Site location and details

The survey area is located on the southern portion of Lot 75 Haag Road, Yelverton (Figure 1). The total survey area is 24ha, comprised of the proposed development area (14ha) and an additional area of native vegetation to be retained (~10ha).

The site is located at the south westerly limit of the Swan Coastal Plain on the Whicher Scarp. The property is within the City of Busselton local government area.

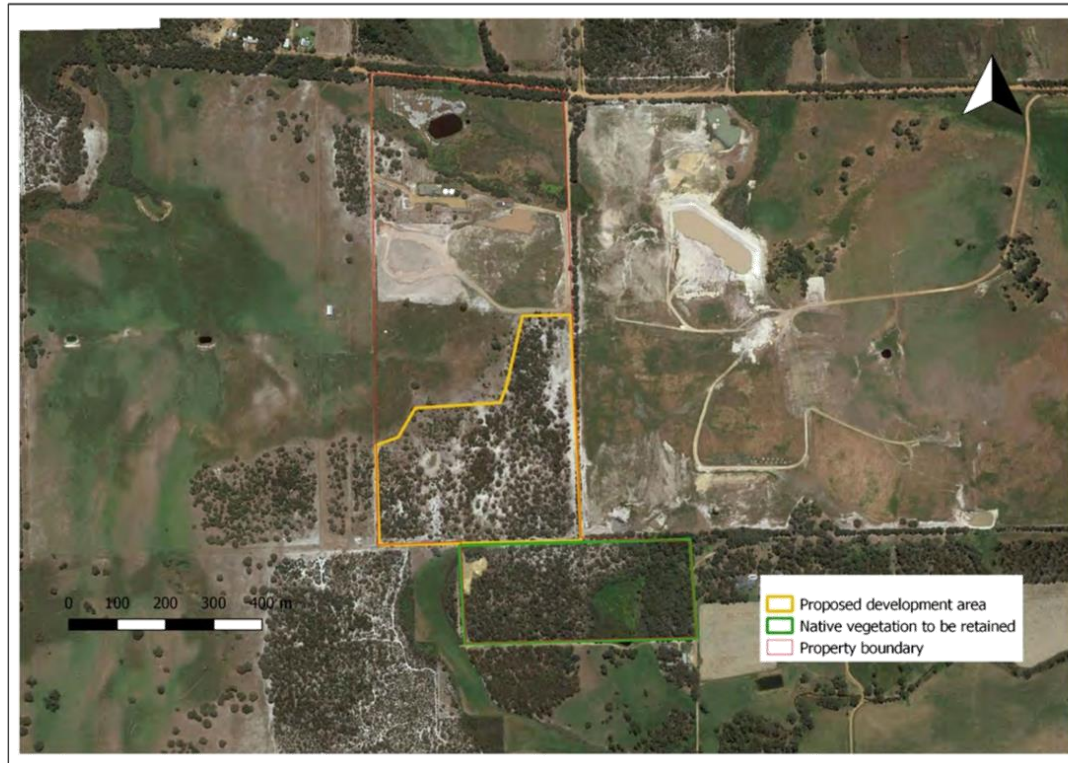


Figure 1: Survey area showing proposed development area

2 Background information

2.1 Soils and landforms

The survey area occurs on the Yelverton Shelf land system on the Whicher Scarp at the north western margin of the Blackwood Plateau. To the north of the survey area the Swan Coastal Plain extends to the coast of Geographe Bay. To the west of the survey area the Leeuwin – Naturaliste Ridge runs north-south.

Soil mapping by the Department of Agriculture and Food (Tille and Lantzke 1990) identifies three soil units within the survey area:

- Yelverton deep sandy flats phase - Level to gently undulating raised shelf, lying 10-40 m above the Swan Coastal Plain. The soils are mainly sands.
- Yelverton wet flats phase - Poorly drained depressions on the shelf surface. Soils are non-saline wet soils and grey-brown sands and loams.
- Yelverton very gentle slopes phase - Undulating terrain. Duplex sandy gravels, semi-wet soils, yellow deep sands and sandy earths and loamy gravels

2.2 Vegetation

The vegetation of the survey area is predominantly remnant native vegetation with varying degrees of disturbance. There has been some historical clearing associated with agricultural development and grazing, particularly in the proposed development area. Some impacts (numerous dead mature trees), possibly as a result of dieback are also evident. A previous dieback assessment indicated that dieback was likely to occur within the project area (Harewood 2018).

Vegetation complexes in the area were mapped by Webb *et al.* (2009) as an extension of earlier work by Mattiske and Havel (1998) and revised through Webb *et al.* (2016). Three vegetation complexes are mapped and described across the site (Figure 2, Table 1).

The State and Federal governments' policies to manage environmental impacts and clearing, apply a target to retain >30% of pre-clearing extent for ecological communities (DER 2014). Vegetation complex mapping is used to represent ecological communities in the south west of Western Australia. Of the vegetation complexes in the current project area, only the Yelverton valleys (Yw) complex has less than 30% the pre-clearing extent intact.

Table 1: Vegetation complexes mapped for the project area

Vegetation complex	Description	% pre-European extent remaining
Yelverton uplands, Yd	Woodland of <i>Allocasuarina fraseriana</i> - <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Xylomelum occidentale</i> - <i>Banksia attenuata</i> on sandy slopes in the humid zone.	55.7
Yelverton valleys, Yw	Woodland of <i>Allocasuarina fraseriana</i> - <i>Nuytsia floribunda</i> - <i>Agonis flexuosa</i> - <i>Banksia attenuata</i> on slopes and open forest of <i>Corymbia calophylla</i> - <i>Eucalyptus patens</i> - <i>Eucalyptus marginata</i> subsp. <i>marginata</i> on the lower slopes and woodland of <i>Eucalyptus rudis</i> - <i>Melaleuca raphiophylla</i> on valley floors in the humid zone.	29.7
Yelverton uplands, Y	Woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Corymbia calophylla</i> - <i>Allocasuarina fraseriana</i> - <i>Agonis flexuosa</i> and open woodland of <i>Corymbia calophylla</i> on low undulating uplands in the humid zone.	35.8

The vegetation communities of part of the current project area have previously been mapped at a finer scale as part of approvals processes for earlier stages of development (Eco Logic Environmental Services Pty Ltd 2013). Four of the vegetation communities described were mapped within the current study area. These were:

OFBaBiAfEmAf- Open Forest of *Banksia attenuata*, *Banksia illicifolia*, *Allocasuarina fraseriana*, *Eucalyptus marginata*, and *Agonis flexuosa* over an Open Shrubland/Scattered shrubs of *Podocarpus drouynianus* over a Herbland of **Hypochoeris* sp., *Chamaescilla corymbosa* and *Burchardia congesta*.

OFEmAfBaXo - Open Forest of *Eucalyptus marginata*, *Allocasuarina fraseriana* and *Banksia attenuata* and *Xylomelum occidentale* over an Open Heath of *Taxandria parviceps* and over low scattered shrubs of *Hibbertia racemosa* and *Podocarpus drouynianus* over a Very Open Herbland of *Rhodanthe citrina*, **Arctotheca calendula* and *Pyrrochis nigricans*.

OFAfBaAf- Open Forest of *Allocasuarina fraseriana*, *Banksia attenuata* and *Agonis flexuosa* over an Open Herbland of **Zantheschia aethiopica*, **Arctotheca calendula*, *Hypochoeris* sp., *Chamaescilla corymbosa* and Open Grassland of **Ehrharta longiflora*, **Hordeum leporium*.

OFAfBaBiAf- Open Forest of *Allocasuarina fraseriana*, *Banksia attenuata* *Banksia illicifolia* and *Agonis flexuosa* over a Shrubland/Open Heath of *Kunzea glabrescens*, *Hibbertia ferruginea* over a Herbland of *Chamaescilla corymbosa*, *Caladenia flava*, **Hypochoeris* sp., and *Burchardia congesta*.

Eco Logic Environmental Services Pty Ltd (2013) also assessed vegetation condition (using the scale developed by Keighery 1994) within the current study area and found the vegetation condition to range from good to completely degraded.

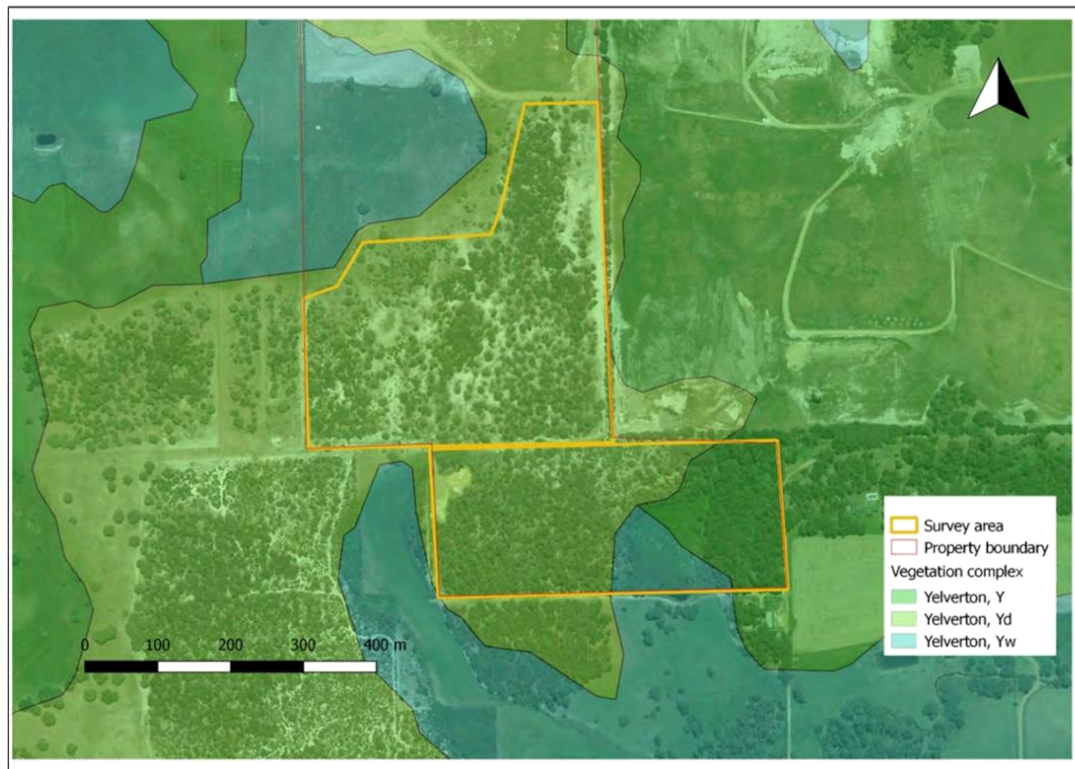


Figure 2: Vegetation complexes for project area and surrounds (Webb et al. 2016).

2.3 Threatened Ecological Communities

Ecological communities are defined as naturally occurring groups of plants, animals and other organisms interacting in a unique habitat. The Department of Biodiversity, Conservation and Attractions (DBCA) identifies and lists ecological communities as a threatened ecological community (TEC) if the community is presumed to be totally destroyed or at risk of becoming totally destroyed. Under the State framework, the listing of TECs is currently non-statutory, however the State government policy framework for environmental impact assessment (EIA) identifies direct impacts to TECs as a potential trigger for referral and formal assessment.

Threatened communities can be classed (see Appendix A for details) as:

- critically endangered (CR)
- endangered (EN)
- vulnerable (VU)
- presumed totally destroyed (PD).

Where communities are considered rare but not (currently) threatened or there is insufficient information available for the community to be considered a TEC, communities can be listed as priority ecological communities (PECs) (definitions of priority classes are provided in Appendix A).

The EPBC Act provides statutory listing and protection for TECs at a Federal level. Under the EPBC Act TECs can be listed as critically endangered, endangered, or vulnerable (Appendix A). Communities listed under the EPBC Act as threatened have statutory protection.

2.4 Threatened and priority flora

Whilst all species of native flora are protected under state legislation, native flora species that are geographically restricted or threatened by local processes may be identified by the DBCA and allocated an elevated conservation status.

The Wildlife Conservation Act (1950) provides for the listing and protection of flora species as 'threatened' if they are under identifiable threat of extinction, rare or otherwise in need of special protection. It is an offence to 'take' (defined under the Act as "...gather, pick, cut, pull up, destroy, remove or injure the flora or to cause or permit the same to be done by any means") threatened or Declared Rare Flora (DRF) species gazetted under Subsection 2 of Section 23F of the Act, without Ministerial approval.

Species may also be identified as priority flora species where they are under consideration for future listing as DRF but there is insufficient information, or they are not currently threatened but could become so if circumstances change (Appendix B).

Flora species can also be listed under the EPBC Act as threatened species and are classed as either extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependant (Appendix B). Any actions likely to have significant impact on

species (or communities) listed under the EPBC Act require referral for assessment and approval from the Federal Minister for the Environment.

3 Survey Methods

3.1 Desktop Survey

A desktop review was completed ahead of field surveys using publicly available datasets to identify potential environmentally significant flora species and vegetation types. Database searches were performed using the Department of the Environment and Energy's Protected Matters Search Tool (Appendix C) and using Nature Map (Appendix D).

A search of the DBCA's threatened flora databases was conducted to identify potential threatened plant species occurring within the survey area. An additional search of Nature Map based on a search area with a radius of 5km was conducted to identify potential flora species (including threatened species) occurring within the project area. The species list from previous survey (Eco Logic Environmental Services 2013) completed at the site was also reviewed to compile a list of potential plant species occurring within the survey area. Key features of threatened flora species identified as likely to occur in the project area were reviewed as part of preparation for the targeted field survey.

Mapping of vegetation associations (eg Beard 1981) and vegetation complexes (Webb *et al.* 2016), and other available regional studies, were reviewed to identify potential vegetation types occurring within the study area. Potential threatened ecological communities were identified through searches of NatureMap and the Protected Matters Search Tool and supplemented through review of relevant literature (eg Keighery *et al.* 2008) and results of previous searches of the DBCA Communities database undertaken in the area.

Soil mapping from Tille and Lantzke (1990) was used to identify soil types and relevant literature utilised to develop a description of the landforms and geomorphology of the project area.

3.2 Field Survey

A field survey incorporating detailed quadrat-based survey and targeted flora searches was completed by Stream Environment and Water, Principal Mike Braimbridge and Lisa Chappell from Focused Vision Consulting Pty Ltd on 15 and 16 September 2018. To maximise the likelihood of recording threatened orchid species, a follow up targeted site visit and traverses were undertaken on 12 October.

Assessment and description of vegetation communities was completed using information collected from 100m² (10x10m) quadrats and additional unmarked relevé sampling. At each location the following information was recorded using standardised field sheets:

- Location and Coordinates
- Soil description and landforms
- Vegetation structure and community description in accordance with the National Vegetation Information System (NVIS) structure and floristics
- Vascular plant species (denoting native and introduced species)
- Height and percentage cover of dominant species in each strata

- Vegetation condition (according to Keighery 1994)

Analysis of floristic community types using a classification analysis was not undertaken as much of the vegetation in the proposed development area was in a degraded (or worse) condition – see section 4.

Targeted searches for threatened flora species was completed through foot traverses of the proposed development area over two field surveys (15,16 September and 12 October) to maximise opportunity of recording target threatened species. Where located, the coordinates of threatened and priority flora species were recorded along with the number of plants.

Observations on vegetation condition were recorded during foot traverses and species lists for community descriptions were supplemented by opportunistic recording of additional species.

Any flora species that were not able to be identified in the field were collected or photographed. Relevant taxonomic literature and databases were used to identify collected specimens.

3.3 Survey Limitations

The survey limitations were considered consistent with EPA Technical Guidance (EPA 2016) and are summarised in Table 2.

Table 2: Assessment of survey limitations

Aspect	Constraint	Comment
Available regional and local information	Negligible	The region is well surveyed with regional vegetation association and complex mapping available. Previous relevant local vegetation survey reports were also available.
Competency of personnel	Negligible	The survey was completed by Mike Braimbridge who has >20 years' experience in conducting flora and vegetation surveys in the Western Australia, including the Swan Coastal Plain and south west. Additional specialist botanical field support was provided by Lisa Chappell from Focused Vision Consulting Pty Ltd who has >15 years' experience in botanical field work across WA.
Proportion of flora identified	Low	The survey was completed during spring flowering period. Where required specimens were collected or photographed and identified using relevant taxonomic literature.
Survey effort and extent	Negligible	Targeted searching effort involved two botanists during initial field visit over two days. An additional site visit was undertaken to cover the potential flowering period of threatened species. Quadrats were replicated in vegetation units and results supplemented using releves and opportunistic sampling. Floristic analysis was not undertaken due to the (generally poor) condition of the vegetation in the target development area.
Accessibility	Negligible	Access to site was provided by landholder

Survey timing and season	Negligible	The survey was completed in mid-September with an additional follow up visit in October to cover likely flowering period for the maximum number of species.
Disturbance	Negligible	Negligible recent disturbances.

4 Results

4.1 Desktop survey

4.1.1 Potential threatened communities and species

The desktop survey identified one federally listed Threatened Ecological Community (TEC) (which is also a state listed PEC) as potentially occurring within the study area and an additional three state listed Priority Ecological Communities (Table 3). The Banksia Woodland of the Swan Coastal Plain TEC was identified as likely to occur based on the previous vegetation descriptions, soils and landforms of the site.

The Banksia Woodlands ecological community typically occurs on well drained, low nutrient soils, commonly on deep Bassendean and Spearwood sands, occasionally on Quindalup sands and on the Whicher Scarp (Commonwealth of Australia 2016).

Table 3: Federally listed Threatened Ecological Communities potentially occurring within the study area.

Community	Typical soil and landform	Consistent with previous vegetation descriptions	Likely to occur	Status (EPBC)	Status (WA)
Banksia Woodlands of the Swan Coastal Plain	Well drained sands; Typically Bassendean and Spearwood, occasionally Quindalup sands; Swan Coastal Plain (Commonwealth of Australia 2016)	Yes, previous vegetation community described potentially consistent with TEC, vegetation complex (Karrakatta Central and South) also potentially consistent with TEC.	Yes	EN	P3
West Whicher Scarp Banksia attenuata woodland (community B2)	West Whicher Scarp on grey/white sands	Potentially consistent with previously described Banksia communities.	Yes	Component of Banksia woodland of SCP	P1
Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (Whicher Scarp community G2)	Sumplands in broad valleys associated with groundwater seepage.	No – not consistent with any descriptions from areas previously surveyed.	Potential on property outside of proposed development area	NA	P1
Swan Coastal Plain paluslope wetlands	Associated with areas of groundwater seepage from the sandy low hills at the base of the Whicher Scarp	No – not consistent with any descriptions from areas previously surveyed.	Unlikely	NA	P1

The results of the threatened flora database searches (from DBCA) identified 43 threatened flora species potentially occurring within the site. Based on a review of the soils, landforms and previous vegetation mapping, 7 species were identified with a high likelihood, and 14 with a moderate likelihood of occurring in habitats found within the project area (Table 4).

Table 4: Threatened and priority flora species potentially occurring within the study area

Taxon	Status (WA)	Status (EPBC)	Likely†	Notes
<i>Acacia flagelliformis</i>	4		M	Erect multi-stemmed shrub to 1 m. Flowers yellow, in full flower. Seasonally wet areas. White sand to brown clay/loam.
<i>Acacia inops</i>	3		M	Twining scandent shrub 40 cm - 1 m, flowers very pale cream. Swamp, black peaty sand over clay.
<i>Acacia lateriticola</i> var. <i>Glabrous</i> variant (B.R.Maslin 6765)	3		M	Hillside. Dry, brown ironstone gravel. Old soil disturbance.
<i>Andersonia</i> sp. <i>Echidna</i> (A.R. Annelis ARA 5500)	2		M	Low, spreading sub-shrub, 20 x 20 cm. Flowers pink calyx, white corolla, anthers purple. Grey/white sands.
<i>Caladenia busselliana</i>	T		M	Creamy gold yellow colouration and labellum lamina uniform in colour, sepals terminating in golden yellow clubs. Sandy loam over clay.
<i>Caladenia procera</i>	T		M	Erect tuberous herb 40 cm high. Flowers greenish-yellow with heavily clubbed sepals, labellum with a purple tip. Sandy clay soils
<i>Caladenia viridescens</i>			M	
<i>Calothamnus lateralis</i> var. <i>crassus</i>			M	
<i>Cyathochaeta teretifolia</i>	3		M	Herb 130 cm high. Winter wet flats. Brown sandy clay.
<i>Daviesia elongata</i>	T		M	Spreading shrub to 50 cm tall by up to 1 m wide with bright green, flat, straight phyllodes. Tangled stems come from a common rootstock. Grey sandy loam.
<i>Lepyrodia heleocharoides</i>	3		M	Rhizomatous herb to 10 cm diameter. Sands.
<i>Pimelea ciliata</i> subsp. <i>longituba</i>	3		M	Slender open erect shrub 30-70 cm, flowers pink. Grey sand over clay.
<i>Synaphea decumbens</i>	3		M	Shrub 35 cm. White grey sand.
<i>Verticordia lehmannii</i>	4		M	1 ft high. Sand.
<i>Actinotus whicheranus</i>	2		N	Tufted sub-shrub, 30/60 cm high x 20 cm wide. Flowers white, in full flower. Winter wet slopes. Red sandy clay over laterite.
<i>Andersonia ferricola</i>	1		N	Straggling shrub to 50 cm. Flowers pale lilac, no smell. Seasonally wet flats. Red clayey sand over ironstone.
<i>Banksia nivea</i> subsp. <i>uliginosa</i>			N	Shallow winter wet soil over ironstone.
<i>Banksia squarrosa</i> subsp. <i>argillacea</i>	T		N	Tall shrub to 3 m. Yellow flowers. Black sandy loam over ironstone.
<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>	4		N	Erect shrub to 3 m. Winter wet plain. Orange brown sandy clay loam over ironstone.
<i>Chamelaucium</i> sp. <i>S coastal plain</i> (R.D.Royce 4872)	T		N	Flowers white, low shrub 12 - 18 inches tall. Creek bank. Dry sandy clay.

Taxon	Status (WA)	Status (EPBC)	Likely†	Notes
<i>Chordifex gracilior</i>	3		N	Rhizomatous herb to 30 cm x 60 cm. In fruit. Winter wet flats, grey brown sand over clay.
<i>Gahnia sclerioides</i>	4		N	Very soft textured leaves. Sandy with surface laterite upslope.
<i>Gastrolobium argyrotichum</i>	T		N	Erect shrub ca 1 m tall. Dry brown loam with outcropping granite.
<i>Gonocarpus pusillus</i>	4		N	Slender herb to 10 cm. On edges of winter wet swamp in grey sandy clay.
<i>Grevillea brachystylis</i> subsp. <i>brachystylis</i>	3		N	Decumbent shrub 20 cm x 1 m, flowers red. Flats, grey sand over clay.
<i>Hakea oldfieldii</i>	3		N	Erect, compact, perennial tree with sweet smell, 5 m high x 7 m wide. Flowers cream. Wetland. Wet brown sandy loam. Brown loam over ironstone
<i>Isopogon formosus</i> subsp. <i>dasylepis</i>	3		N	Erect slender shrub 0.5 - 1.5 m, flowers pink. Low, winter wet, red clay over ironstone.
<i>Lasiopetalum laxiflorum</i>	3		N	Lax shrub 1.5 m high. Flowers purple. Brown laterite.
<i>Loxocarya magna</i>	3		N	Rhizomatous perennial sedge. Seasonally wet poorly drained. Red sandy clay over sheet ironstone
<i>Pultenaea pinifolia</i>	3		N	Tall shrub, to 3 m tall, flowers orange-yellow, eye yellow surrounded by red line. Along creekline, in sand over clay.
<i>Schoenus</i> sp. Jindong (R.D. Royce 2485)	1		N	Moist red loamy soil on banks of stream.
<i>Stylidium leuwinense</i>	4		N	Slender erect perennial herb. Seasonally wet poorly drained flat. White sandy clay
<i>Synaphea hians</i>	3		N	Prostrate shrub 1 m diam., flowers yellow. Wetland. Sand over clay.
<i>Synaphea petiolaris</i> subsp. <i>simplex</i>	3		N	Plants young with very high number of simple red +/- glabrous young leaves. Some plants with leaves divided into three lobes. Red-brown laterite sandy loam.
<i>Thysanotus isantherus</i>	4		N	Erect tuberous herb, 15 cm high. Purple flowers. Ironstone gravel.
<i>Verticordia plumosa</i> var. <i>ananeotes</i>	T		N	Multstemmed shrub to 0.7 m high x 0.9 m wide. Flowers pink. Brown loam.
<i>Acacia semitrullata</i>	4		Y	Slender shrub to 0.6m. Grey/brown sand.
<i>Boronia capitata</i> subsp. <i>gracilis</i>	3		Y	Divaricating shrub 0.3 m high. Petals bright deep pink, with central crimson stripe. Staminal filaments pale pink. Anthers grey with white appendages pollen pale yellow. Pale grey sand.
<i>Caladenia excelsa</i>	T		Y	Perianth cream, labellum white and maroon.
<i>Drakaea micrantha</i>	T		Y	Upright orchid, 250 mm high x 20 mm wide. Grey sand.
<i>Johnsonia inconspicua</i>	3		Y	Herb 20 cm high. White sand.
<i>Laxmannia jamesii</i>	4		Y	Stilted perennial herb. Grey sand.
<i>Thysanotus glaucus</i>	4		Y	Caespitose perennial herb to 15 cm; flowers purple, largely in bud. Grey sand.

†Likelihood categorised as Y (yes likely), M (moderate likelihood), N (not likely).

4.1.2 Other conservation considerations

The vegetation on the site occurs within one of the areas identified as a corridor in the South West Ecological Linkage study by Molloy *et al* (2009). The linkages identify patches of native vegetation that form “stepping stones for flora and fauna between regionally significant areas” (Molloy *et al.* 2009).

The linkages do not have statutory protection but are recognised as a consideration in relevant EPA and planning policies.

4.2 Field Survey

4.2.1 Flora

The field survey recorded 108 taxa of vascular plants from 37 families (Appendix E). Thirteen of the 108 taxa are introduced. An additional 11 species (including 4 introduced species) were recorded in the previous survey by Ecological Environmental Services (2013) but were not recorded during the current project. The dominant families in terms of number of taxa recorded (including all species from both surveys) were Myrtaceae with 12 taxa, Asteraceae with 10, Poaceae and Fabaceae both with 9 taxa.

Threatened species

No state listed DRF or priority flora species, or federally listed threatened flora species were recorded in the project area in the current survey. The previous survey by Eco Logic Environmental Services (2013) recorded the priority 3 species *Stylidium loweriana*.

Searches via foot traverses thoroughly covered the proposed development area (Figure 3).

Five taxa recorded during this survey were identified by Keighery *et al.* (2008) as significant taxa (Table 5).

Declared Weeds

Two of the thirteen introduced flora species recorded during the survey, are listed as declared pest plants under the *Biosecurity and Agriculture Management Act* (2007), *Asparagus asparagoides* (bridal creeper) and *Zantedeschia aethiopica* (Arum lily).

Weed species were not mapped for this project.

Table 5: Significant taxa identified by Keighery et al 2008 recorded during current survey.

Taxa	Reason for significance (adapted from Keighery et al 2008)	Community recorded in (see Table 6).
<i>Homalospermum firmum</i>	Disjunct population (West Whicher Scarp), Significant population, uncommon in area, restricted to freshwater seepages.	Wetland Shrubland (HfAf)
<i>Dampiera linearis</i>	Morphological variant, genetic variant.	Jarrah-Marri Woodland (EmCcAf)
<i>Hibbertia acerosa</i>	Disjunct population, Significant population, Uncommon in area.	Jarrah-Marri Woodland (EmCcAf)
<i>Hibbertia ferruginea</i>	Recently recognised taxa, NB population west of Vasse Highway common.	Previously recorded by Eco Logic Environmental Services (2013) in Banksia Woodland (BaBiKg) equivalent.
<i>Hypolaena exsulca</i>	Morphological variant	Marri Forest (CcEmBg) and Wetland Shrubland (HfAf)

4.2.2 Vegetation communities

Seven vegetation units were identified within the survey area, including one which is cleared or predominantly cleared and six which are predominantly native vegetation communities (Figure 4). Community descriptions for the six native vegetation communities are based on the results of quadrats (and relevés where relevant) surveyed in each, supplemented by additional opportunistic recording of additional species during targeted searches (Table 6)(Quadrat data provided in Appendix F).

The vegetation communities identified were generally consistent with those described for the area by Eco Logic Environmental Services (2013). Additional vegetation communities described for the southern portion of the property in this study were not surveyed by Eco Logic Environmental Services (2013).

Vegetation of conservation significance

Both the Banksia Woodland (BaBiKg) and the Sheoak-Banksia Woodland (AfBaBi) are consistent with the diagnostic characteristics of the Banksia Woodland of the Swan Coastal Plain TEC (listed under EPBC Act as Endangered and under State policy as Priority 3). The TEC structure is typically low woodland to forest with a canopy dominated or co-dominated by a number of Banksia species, including as in this case *Banksia attenuata* (Commonwealth of Australia 2016). None of the contra-indicators i.e. dominant or co-dominant species such as *Bankia littoralis* are present in this community.

The Sheoak-Banksia Woodland (AfBaBi) has affinities with the State listed Priority 1 West Whicher Scarp *Banksia attenuata* woodland (B2) (which is a component of the EPBC listed Banksia Woodland of the Swan Coastal Plain TEC). However, the poor condition of the vegetation and disturbed nature of the understorey in particular, meant that definitive identification of the priority ecological community is difficult.

The wetland area mapped as Wetland Shrubland (HfAsf) has possible affinities to the Priority 1 Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (G2) vegetation community. The landform is consistent with the description given by Keighery *et al.* (2008) for west Whicher Scarp valley wetlands of vegetation communities associated with permanent/near permanent wetlands fed by persistent freshwater seepages. Further survey (to assess additional quadrats) and analysis of floristic community types using regional datasets would be required to confirm the community described as the priority 1 ecological community.

4.2.3 Vegetation condition

Vegetation condition across the survey area ranged from completely degraded to very good (Figure 5). In general, the condition of the northern portion of the survey area was poor compared to the southern portion. Historical grazing and potentially dieback have affected the structure of the vegetation in much of the potential development area. In this area the understorey has relatively poor diversity and cover of native species, in particular, a perennial native shrub layer is lacking in many areas. The overstorey is generally intact, however there are sparse patches and dead trees.

The condition of the Banksia Woodland communities (AfBaBi and BaBiKg) generally poor and ranged from completely degraded to good condition (Figure 5). Of the total 11.9ha of combined Banksia Woodland communities, 1.3ha was in good condition, 2ha was mapped as degraded/good, 8.1ha as degraded and 0.5ha as completely degraded condition.

In contrast most of the vegetation in the southern portion of the property was mapped as good to very good condition (Figure 5).

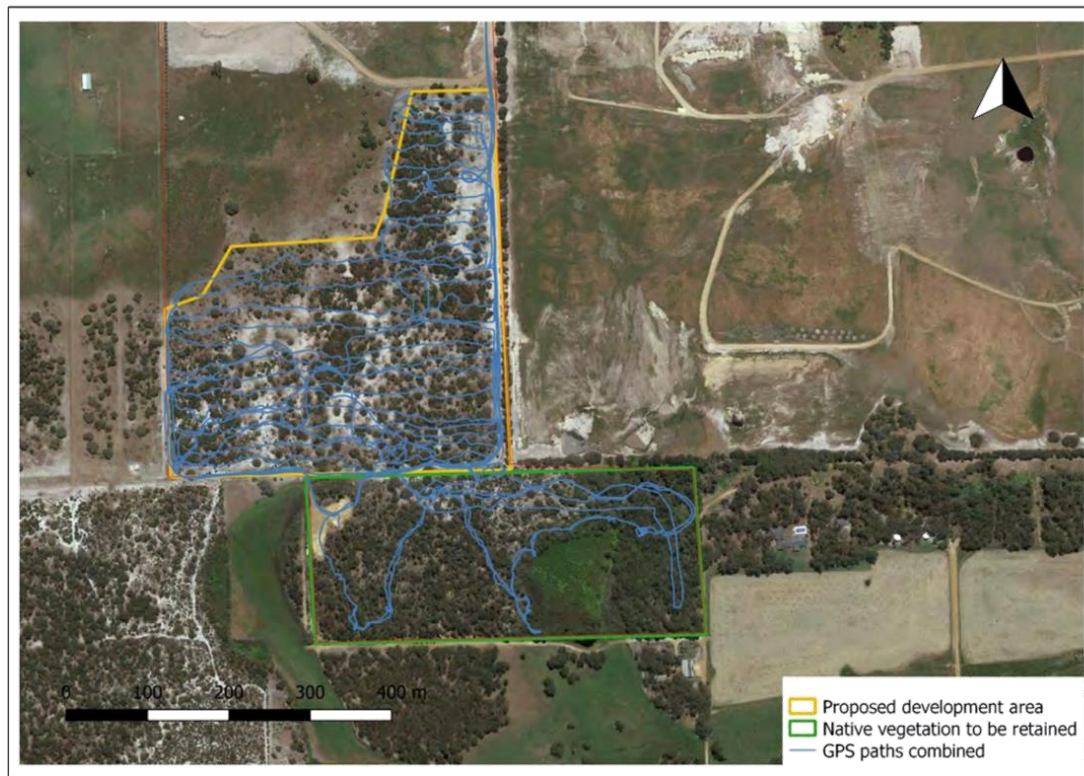


Figure 3: GPS tracks for foot traverses of study area.

Table 6: Vegetation communities described for the project area.

Community description	Quadrats	Code	NVIS Code (level IV sub-formation)
Cleared or parkland cleared		CI	NA
Banksia Woodland Open forest of <i>Banksia attenuata</i> , <i>B. ilicifolia</i> and <i>Agonis flexuosa</i> over open shrubland of <i>Kunzea glabrescens</i> over grassland of <i>Briza minor</i> with sparse forbland of <i>Chamaescilla corymbosa</i> and <i>Hypochaeris glabra</i> .	6,9,11	BaBiKg	+ <i>Banksia</i> open forest\ <i>Kunzea</i> low open shrubland\ <i>Chamaescilla</i> low sparse forbland
Sheoak-Banksia Woodland Open forest of <i>Allocasuarina fraseriana</i> , <i>Banksia attenuata</i> , <i>B. ilicifolia</i> and <i>Agonis flexuosa</i> over sparse shrubland of <i>Podocarpus drouynianus</i> and <i>Taxandria parviceps</i> over sparse forbland of <i>Burchardia congesta</i> , <i>Chamaescilla corymbosa</i> and <i>Ursinia anthemoides</i> .	R7,8,10	AfBaBi	+ <i>Allocasuarina</i> open forest\ <i>Podocarpus</i> low sparse shrubland\ <i>Ursinia</i> low sparse forbland
Peppermint-Sheoak woodland Open forest of <i>Agonis flexuosa</i> and <i>Allocasuarina fraseriana</i> over open shrubland of <i>Kunzea glabrescens</i> over grassland of <i>Briza maxima</i> and <i>Anthoxanthum odoratum</i> and sparse forbland of <i>Arctotheca calendula</i> , <i>Chamaescilla corymbosa</i> , <i>Burchardia congesta</i> and <i>Ursinia anthemoides</i> .	R12	AgAfKg	+ <i>Agonis</i> open forest\ <i>Kunzea</i> low open shrubland\ <i>Briza</i> open grassland
Jarrah-Marri woodland Woodland of <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> and <i>Allocasuarina fraseriana</i> over open shrubland of <i>Hibbertia hypericoides</i> , <i>Kingia australis</i> , <i>Xanthorrhoea gracilis</i> and <i>Podocarpus drouynianus</i> over sparse sedgeland of <i>Schoenus</i> sp. and open forbland of <i>Dampiera lineris</i> , <i>Chamaescilla corymbosa</i> and <i>Scaevola calliptera</i>	1,2	EmCcAf	+ <i>Eucalyptus</i> woodland\ <i>Hibbertia</i> low open shrubland\ <i>Schoenus</i> sparse sedgeland.
Marri Forest Tall open forest of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over open woodland of <i>Banksia grandis</i> over open shrubland of <i>Kingia australis</i> , <i>Xanthorrhoea preissii</i> , <i>Taxandria parviceps</i> and <i>Xanthorrhoea gracilis</i> and sedgeland of <i>Lepidosperma pubisquamatum</i> and <i>Mesomelaena tetragona</i>	5,13	CcEmBg	+ <i>Corymbia</i> tall open forest\ <i>Banksia</i> open woodland\ <i>Lepidosperma</i> sedgeland
Wetland Shrubland Closed shrubland of <i>Homalospermum firmum</i> and <i>Astartea fascicularis</i> over sedgeland of <i>Baumea vaginalis</i> .	3,4 [†]	HfAsf	+ <i>Homalospermum</i> closed shrubland\ <i>Baumea</i> open sedgeland

[†]Northern section of the wetland appeared to have historically been disturbed and vegetation was dominated by *Pteridium esculentum*

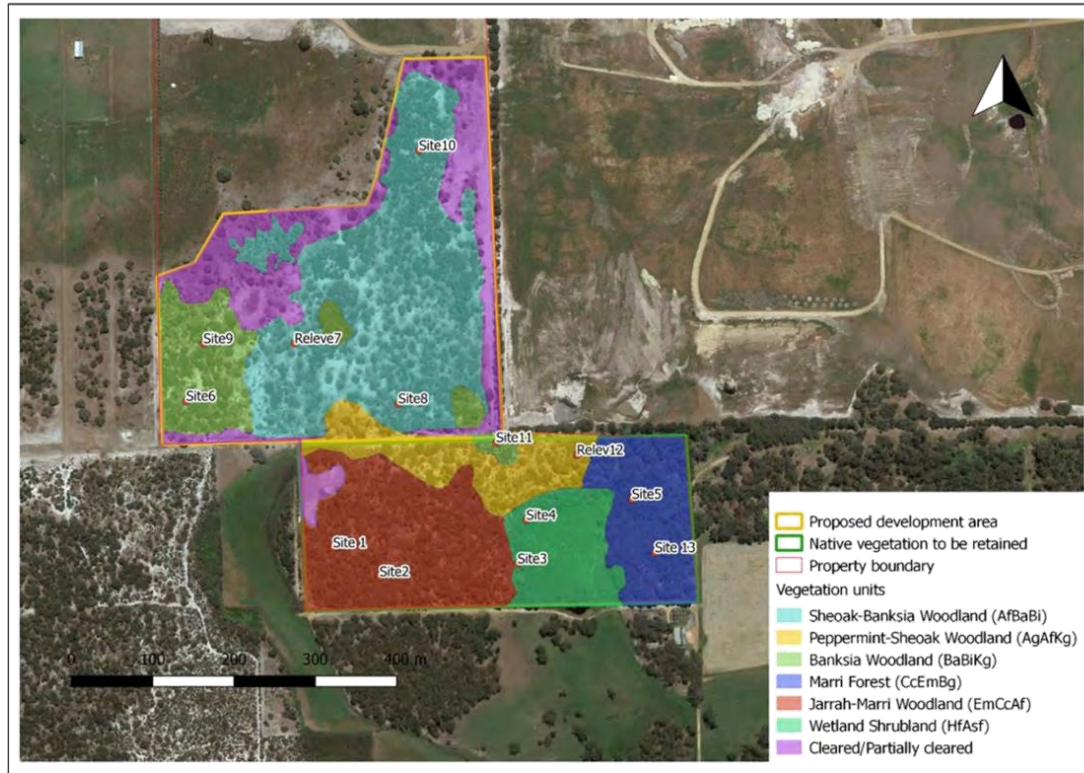


Figure 4: Vegetation communities for the survey area.

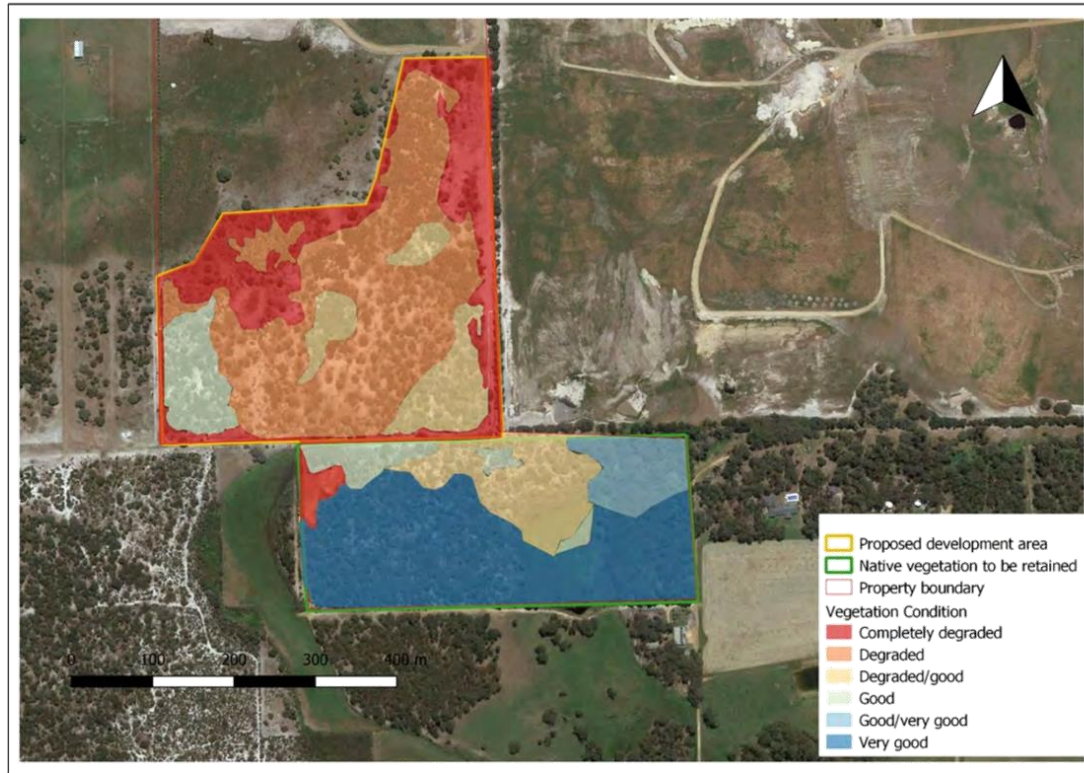


Figure 5: Vegetation condition for survey area.

5 Discussion

The results of the current study were generally consistent with the previous survey of the area by Eco Logic Environmental services in 2013 and what would be expected to occur based on a review of regional studies. The dominance of Myrtaceae and Fabaceae families is typical of vegetation complexes in the area. The prevalence of Asteraceae and Poaceae is a consequence historical disturbance with 5 of the 10 species of Asteraceae species and 5 of 9 Poaceae species recorded were introduced.

None of the species recorded were listed threatened species under State or Federal legislation. The timing of the survey maximised the potential for positively identifying the majority of threatened species, including threatened orchid species such as *Drakaea micrantha* and *Caladenia excelsa*. Several orchid species (such as *Caladenia latifolia*, *Drakaea glyptodon* and *Paracaleana nigrita*) with similar flowering periods were recorded during the survey.

Five species of 'other conservation significance' (as identified in Keighery *et al.* 2008) were identified in the survey. Of these, *Hibbertia acerosa* and *Homalospermum firmum* are possibly the most noteworthy. Both are identified as of elevated conservation significance in the Whicher Scarp because populations in the Whicher Scarp are disjunct (Keighery *et al.* 2008). Both of these species were found in vegetation communities in the southern portion of property which will be retained under current development plans.

The wetland community in this southern portion of 'vegetation to be retained' is also of potential conservation significance. It is mapped as part of the Yelverton Valleys vegetation complex which has less than 30% of its pre-European extent remaining and the shrubland community has potential affinities with the Priority 1 Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (G2). Florisitic analysis would be required to confirm this.

The other vegetation communities identified are consistent with previous local and regional surveys. The two Banksia woodland communities are consistent with the diagnostic characteristics of the Banksia woodlands of the Swan Coastal Plain TEC. As identified in the previous survey (Eco Logic Environmental Services 2013), the Sheoak-Banksia Woodland also has possible affinities with the state listed priority 1 West Whicher Scarp *Banksia attenuata* woodland (B2). However, confirmation of this is made difficult by the poor condition of the vegetation and general lack of understorey species. All of the areas mapped as this community were in degraded-good to completely degraded condition.

Overall the condition of the proposed area for development was poor. Only 1.3ha of the combined 11.9ha of Banksia woodland (both communities combined) was found to be in good condition and meet minimum criteria for listing of the TEC. The conservation advice for the Banksia Woodland TEC identifies a minimum condition threshold of 'good' for vegetation with the relevant characteristics to be considered as the Banksia TEC. For vegetation with a condition of 'good' a minimum patch size for "consideration of a patch as

part of the listed ecological community for EPBC Act referral, assessment and compliance purposes" is set at 2ha (Commonwealth of Australia 2016).

Conclusions

- The survey identified and mapped vegetation communities consistent with what would be expected to occur in the local area.
- No formally listed species of threatened flora were found during the survey.
- Five species of potential conservation significance were recorded including *Homalospermum firmum* and *Hibbertia acerosa* in the southern portion of the survey area.
- 11.9ha of Banksia woodland consistent with the characteristics of the federally listed Banksia Woodlands of the Swan Coastal plain threatened ecological community was mapped in the potential development area. Of this 1.3ha was in good condition and therefore meets the minimum requirement to be classified as the TEC but is under the minimum patch size of 2ha. The remainder in degraded/good to degraded condition and therefore does not meet the minimum requirements to be classified as the TEC.
- No statistical analysis of floristic community types was undertaken due to the poor condition of vegetation in the potential development area.
- The condition of vegetation in the southern area identified to be retained on site was in general better than the northern section.
- One community of potential conservation significance, i.e. wetland community with affinities to the Priority 1 Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (G2) was recorded in the southern portion of the survey area. Floristic analysis would be required to confirm this.

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Appendix A: Categories and definitions for threatened and priority ecological communities.

State Threatened and Priority Ecological Community Categories

Category	Description
Threatened	
Presumed totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located.
Critically Endangered (CR)	An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
Endangered (EN)	An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future.
Vulnerable (VU)	An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future.
Priority	
Priority 1 (P1) – Poorly known	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist.
Priority 2 (P2) – Poorly known	Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation.
Priority 3 (P3) – Poorly known	Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range
Priority 4 (P4) – Adequately known	Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.
Priority 5 (P5) – Conservation dependent	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

EPBC Act conservation categories for threatened ecological communities

Category	Description
Critically Endangered (CR)	An ecological community that is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years)
Endangered (EN)	An ecological community that is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).
Vulnerable (VU)	an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium-term future (indicative timeframe being the next 50 years).

Appendix B: Categories and definitions for threatened and priority flora species

CONSERVATION CODES FOR WESTERN AUSTRALIAN FLORA

<p>T: Threatened Flora - Specially protected under the Wildlife Conservation Act 1950, listed under Schedules 1, 2 and 3 of the Wildlife Conservation (Rare Flora) Notice (which may also be referred to as Declared Rare Flora). Taxa which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of these species is based on their national extent. Ranking: CR · Schedule 1 - taxa that are extant and considered likely to become extinct or rare, as critically endangered flora, and therefore in need of special protection. EN · Schedule 2 - taxa that are extant and considered likely to become extinct or rare, as endangered flora, and therefore in need of special protection. VU · Schedule 3 - taxa that are extant and considered likely to become extinct or rare, as vulnerable flora, and therefore in need of special protection.</p>
<p>EX: Presumed extinct Flora - Specially protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedule 4 of the Wildlife Conservation (Rare Flora) Notice (which may also be referred to as Declared Rare Flora). Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such. Threatened flora are ranked according to their level of threat using IUCN Red List categories and criteria. EX · Schedule 4 - taxa that are presumed to be extinct in the wild and therefore in need of special protection.</p>
<p>Priority Flora Taxa that may be threatened or near threatened, but are data deficient or have not yet been adequately surveyed to be listed under the Wildlife Conservation (Rare Flora) Notice, are added to the Priority Flora List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status, so that consideration can be given to their declaration as threatened flora. Taxa that are adequately known and are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These taxa require regular monitoring.</p>
<p>1: Priority One: Poorly-known species Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations, but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.</p>
<p>2: Priority Two: Poorly-known species Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations, but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.</p>
<p>3: Priority Three: Poorly-known species Species that are known from several locations, and the species do not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations, but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.</p>
<p>4: Priority Four: Rare, Near Threatened and other species in need of monitoring</p>

- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
- (b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
- (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

EPBC Act conservation categories (follow IUCN Red List categories)

Category	Description
Extinct (EX)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual.
Extinct in the wild (EW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual.
Critically Endangered (CR)	A taxon is Critically Endangered when the best available evidence indicates that it is considered to be (according to specified criteria) facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon is Endangered when it is considered (according to specified criteria) to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it is considered (according to specified criteria) to be facing a high risk of extinction in the wild.
Conservation dependent (CD)	A taxon is conservation dependent if, at a particular time, it is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered.

Appendix C: Protected Matters database search results



Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 03/08/18 14:19:30

[Summary](#)

[Details](#)

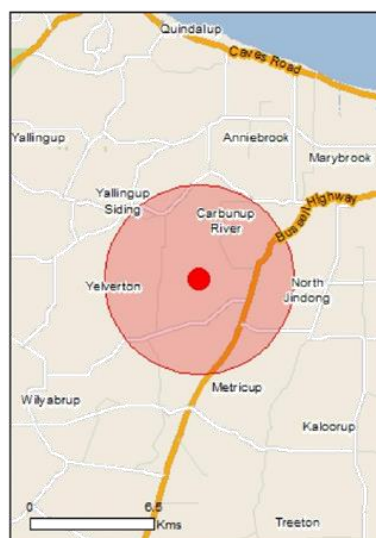
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

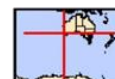
[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)
[Buffer: 5.0Km](#)



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	29
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	6
Regional Forest Agreements:	1
Invasive Species:	25
Nationally Important Wetlands:	None
Key Ecological Features (Marine):	None

Name	Status	Type of Presence
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat known to occur within area
Other		
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Banksia nivea subsp. uliginosa Swamp Honeypot [82766]	Endangered	Species or species habitat may occur within area
Banksia squarrosa subsp. argillacea Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat may occur within area
Brachyscias verecundus Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may occur within area
Caladenia busselliana Bussell's Spider-orchid [24369]	Endangered	Species or species habitat likely to occur within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
Caladenia procera Carbunup King Spider Orchid [68679]	Critically Endangered	Species or species habitat may occur within area
Caladenia viridescens Dunsborough Spider-orchid [56776]	Endangered	Species or species habitat may occur within area
Chamelaucium sp. S coastal plain (R.D.Royce 4872) Royce's Waxflower [87814]	Vulnerable	Species or species habitat may occur within area
Daviesia elongata subsp. elongata Long-leaved Daviesia [64883]	Vulnerable	Species or species habitat known to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat may occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus x phylacis Meelup Mallee [87817]	Endangered	Species or species habitat may occur within area
Gastrolobium papilio Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area
Grevillea brachystylis subsp. grandis Large-flowered Short-styled Grevillea [85001]	Critically Endangered	Species or species habitat likely to occur within area
Lambertia echinata subsp. occidentalis Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence area
Petrophile latericola Laterite Petrophile [64532]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Migratory Terrestrial Species

Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
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Migratory Wetlands Species

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
--	--	--

Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
--	--	--

Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
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Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
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Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
--	--	--

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
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Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
---	--	--

Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
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Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
---	--	--

Name	Threatened	Type of Presence
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves		[Resource Information]
Name	State	
Haag	WA	
NTWA Bushland covenant (0116A)	WA	
NTWA Bushland covenant (0116B)	WA	
NTWA Bushland covenant (0148)	WA	
NTWA Bushland covenant (0149)	WA	
Yelverton	WA	
Regional Forest Agreements		[Resource Information]
Note that all areas with completed RFAs have been included.		
Name	State	

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
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Birds

Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
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Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
--	------------	--

Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
---	-----------------------	--

Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
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Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Breeding known to occur within area
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Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat likely to occur within area
--	------------	--

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
---	-----------------------	--

Crustaceans

Engaewa reducta Dunsborough Burrowing Crayfish [82675]	Critically Endangered	Species or species habitat known to occur within area
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Fish

Nannatherina balstoni Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat may occur within area
--	------------	--

Mammals

Dasyurus geoffroi Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
--	------------	--

Name	State
South West WA RFA	Western Australia

Invasive Species [\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
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Birds

Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area

Mammals

Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

Plants

Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area

Name	Status	Type of Presence
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-33.72832 115.13804

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

Appendix D: Nature Map database search results (threatened species)

	Name ID	Species Name	Conservation Code
501	16258	<i>Schoenus</i> sp. Jindong (R.D. Royce 2485)	P1
54	41767	<i>Andersonia</i> sp. Echidna (A.R. Annel ARA 5500)	P2
7	3386	<i>Acacia inops</i>	P3
9	14930	<i>Acacia lateritica</i> var. Glabrous variant (B.R.Maslin 6765)	P3
87	11612	<i>Boronia capitata</i> subsp. <i>gracilis</i>	P3
125	35799	<i>Calothamnus lateralis</i> var. <i>crassus</i>	P3
143	17686	<i>Chordifex gracilior</i>	P3
178	16245	<i>Cyathochaeta teretifolia</i>	P3
257	14011	<i>Grevillea brachystylis</i> subsp. <i>brachystylis</i>	P3
270	2190	<i>Hakea oldfieldii</i>	P3
313	16522	<i>Isopogon formosus</i> subsp. <i>dasylepis</i>	P3
317	1296	<i>Johnsonia inconspicua</i>	P3
331	45084	<i>Lasiopetalum laxiflorum</i>	P3
355	1086	<i>Lepyrodia heleocharoides</i>	P3
454	12077	<i>Pimelea ciliata</i> subsp. <i>longituba</i>	P3
488	4179	<i>Pultenaea pinifolia</i>	P3
537	16937	<i>Synaphea decumbens</i>	P3
540	16769	<i>Synaphea hians</i>	P3
543	16862	<i>Synaphea petiolaris</i> subsp. <i>simplex</i>	P3
6	3339	<i>Acacia flagelliformis</i>	P4
19	3537	<i>Acacia semitrullata</i>	P4
127	35796	<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>	P4
238	17744	<i>Gahnia sclerioides</i>	P4
253	6162	<i>Gonocarpus pusillus</i>	P4
333	1302	<i>Laxmannia jamesii</i> (James' Paperlily)	P4
523	17411	<i>Stylidium leeuwinense</i>	P4
570	1334	<i>Thysanotus glaucus</i>	P4
571	1336	<i>Thysanotus isantherus</i>	P4
598	6093	<i>Verticordia lehmannii</i>	P4
78	32046	<i>Banksia squarrosa</i> subsp. <i>argillacea</i>	T
110	13615	<i>Caladenia busselliana</i>	T
113	13619	<i>Caladenia excelsa</i>	T
119	18038	<i>Caladenia procera</i>	T
121	13622	<i>Caladenia viridescens</i>	T
141	43980	<i>Chamelaucium</i> sp. S coastal plain (R.D.Royce 4872)	T
189	3808	<i>Daviesia elongata</i>	T
208	13635	<i>Drakaea micrantha</i>	T
240	44440	<i>Gastrolobium argyrotichum</i>	T
258	19414	<i>Grevillea brachystylis</i> subsp. <i>grandis</i>	T
276	6867	<i>Hemigenia ramosissima</i>	T
599	12448	<i>Verticordia plumosa</i> var. <i>ananeotes</i>	T

Appendix E: Vascular plants species recorded for survey area

Family	Genus	Species	Naturalised	Threatened	Community							
					BaBiKg	AfBaBi	AgAfKg	EmCcAf	CcEmBg	HfAf	Previous†	
Anarthriaceae	<i>Anarthria</i>	<i>prolifera</i>						+		+		
	<i>Lyginia</i>	<i>barbata</i>			+						+	
Apiaceae	<i>Daucus</i>	<i>glochidiatus</i>										#
	<i>Pentapeltis</i>	<i>peltigera</i>						+		+		
	<i>Xanthosia</i>	<i>candida</i>						+				
Araceae	<i>Zantedeschia</i>	<i>aethiopica</i>	*		+						+	#
Araliaceae	<i>Trachymene</i>	<i>pilosa</i>			+	+						
Asparagaceae	<i>Lomandra</i>	<i>micrantha</i>						+				
	<i>Lomandra</i>	<i>nigricans</i>								+		
	<i>Lomandra</i>	sp.						+				
	<i>Sowerbaea</i>	<i>laxiflora</i>										
	<i>Thysanotus</i>	<i>manglesianus</i>										#
Asteraceae	? <i>Ptilotus</i>	<i>manglesii</i>							+			
	<i>Arctotheca</i>	<i>calendula</i>	*		+	+	+					#
	<i>Hypochoeris</i>	<i>glabra</i>	*		+	+	+	+		+		
	<i>Hypochoeris</i>	sp.										#
	<i>Lagenophora</i>	<i>huegelii</i>						+		+		
	<i>Quinetia</i>	<i>urvillei</i>			+	+						
	<i>Rhodanthe</i>	<i>citrina</i>					+					#
	<i>Soliva</i>	<i>pterosperma</i>	*		+		+					
Casuarinaceae	<i>Allocasuarina</i>	<i>fraseriana</i>			+	+	+	+		+	+	#
Colchicaceae	<i>Burchardia</i>	<i>congesta</i>			+	+	+	+				#
Cyatheaceae	<i>Cyathea</i>	? <i>cooperi</i>	*								+	
Cyperaceae	<i>Baumea</i>	<i>vaginalis</i>									+	
	<i>Lepidosperma</i>	<i>leptostachyum</i>										#
	<i>Lepidosperma</i>	<i>pubisquamatum</i>								+		

Family	Genus	Species	Naturalised	Threatened	Community							
					BaBiKg	AfBaBi	AgAfKg	EmCcAf	CcEmBg	HfAf	Previous†	
	<i>Lepidosperma</i>	<i>squamatum</i>										
	<i>Mesomelaena</i>	<i>tetragona</i>						+	+			
	<i>Schoenus</i>	sp.						+				
	<i>Tetralia</i>	<i>capillaris</i>						+	+			
	<i>Tetralia</i>	<i>octandra</i>						+	+			
Dasypogonaceae	<i>Dasypogon</i>	<i>bromeliifolius</i>			+							+
	<i>Kingia</i>	<i>australis</i>						+	+			+
Dennstaedtiaceae	<i>Pteridium</i>	<i>esculentum</i>							+			+
Dilleniaceae	<i>Hibbertia</i>	<i>acerosa</i>						+				
	<i>Hibbertia</i>	<i>ferruginea</i>										#
	<i>Hibbertia</i>	<i>hypericoides</i>			+			+	+			
	<i>Hibbertia</i>	<i>notibractea</i>			+							
	<i>Hibbertia</i>	<i>racemosa</i>										#
Droseraceae	<i>Drosera</i>	<i>micrantha</i>			+							
	<i>Drosera</i>	<i>stolonifera</i>						+				
Ericaceae	<i>Leucopogon</i>	<i>australis</i>										+
	<i>Leucopogon</i>	<i>capitellatus</i>						+				
Fabaceae	<i>Acacia</i>	<i>divergens</i>										+
	<i>Acacia</i>	<i>pulchella</i>			+							+
	<i>Chorizema</i>	<i>rhombeum</i>						+				
	<i>Hovea</i>	<i>chorizemifolia</i>						+				
	<i>Hovea</i>	<i>pungens</i>										#
	<i>Isotropis</i>	<i>cuneifolia</i>			+							
	<i>Jacksonia</i>	<i>furcellata</i>										+
	<i>Lotus</i>	<i>angustissimus</i>										#
	<i>Mirbelia</i>	<i>dilitata</i>										+
Geraniaceae	<i>Geranium</i>	<i>solanderi</i>										+
Goodeniaceae	<i>Dampiera</i>	<i>linearis</i>						+				
	<i>Scaevola</i>	<i>calliptera</i>						+				
Haemodoraceae	<i>Anigozanthus</i>	sp.										+
	<i>Conostylis</i>	<i>setosa</i>						+				

Family	Genus	Species	Naturalised	Threatened	Community						
					BaBiKg	AfBaBi	AgAfKg	EmCcAf	CcEmBg	HfAf	Previous†
	<i>Haemodoraceae</i>	sp.						+			
Hemerocallidaceae	<i>Caesia</i>	<i>micrantha</i>						+	+		
Iridaceae	<i>Patersonia</i>	<i>occidentalis</i>							+		
	<i>Romulea</i>	<i>rosea</i>			+		+				
Lauraceae	<i>Cassytha</i>	sp.								+	
Lindsaeaceae	<i>Lindsaea</i>	<i>linearis</i>							+		#
Loranthaceae	<i>Nyctia</i>	<i>floribunda</i>			+	+		+			
Myrtaceae	<i>Agonis</i>	<i>flexuosa</i>			+	+	+	+	+		#
	<i>Astartea</i>	<i>fascicularis</i>								+	
	<i>Corymbia</i>	<i>calophylla</i>						+	+		
	<i>Eucalyptus</i>	<i>marginata</i>				+		+	+	+	#
	<i>Eucalyptus</i>	<i>patens</i>								+	
	<i>Homalospermum</i>	<i>firmum</i>								+	
	<i>Hypocalymma</i>	<i>angustifolium</i>						+	+		
	<i>Hypocalymma</i>	<i>robustum</i>								+	
	<i>Kunzea</i>	<i>glabrescens</i>			+		+			+	#
	<i>Kunzea</i>	<i>recurva</i>								+	
	<i>Melaleuca</i>	<i>?systema</i>			+						
	<i>Taxandria</i>	<i>parviceps</i>								+	#
Orchidaceae	<i>Caladenia</i>	<i>flava</i>			+			+	+	+	#
	<i>Caladenia</i>	<i>latifolia</i>								+	
	<i>Drakaea</i>	<i>glyptodon</i>								+	
	<i>Paracaleana</i>	<i>nigrita</i>								+	
	<i>Pterostylis</i>	<i>pyramidalis</i>								+	
	<i>Pterostylis</i>	sp. Crinkled leaf						+	+		
	<i>Pyrorchis</i>	<i>nigricans</i>			+	+					#
Pittosporaceae	<i>Billardiera</i>	<i>variifolia</i>						+			
Poaceae	<i>Amphipogon</i>	sp.						+			
	<i>Anthoxanthum</i>	<i>odoratum</i>		*			+			+	
	<i>Avena</i>	sp.		*	+	+	+	+			

Family	Genus	Species	Naturalised	Threatened	Community							
					BaBiKg	AfBaBi	AgAfKg	EmCcAf	CcEmBg	HfAf	Previous†	
	<i>Briza</i>	<i>maxima</i>	*				+					
	<i>Briza</i>	<i>minor</i>	*		+	+						
	<i>Ehrharta</i>	<i>longiflora</i>	*		+	+						#
	<i>Hordeum</i>	<i>leporium</i>										#
	<i>Neurachne</i>	<i>alopecuroidea</i>						+				
	<i>Tetrarrhena</i>	<i>laevis</i>						+	+			
Podocarpaceae	<i>Podocarpus</i>	<i>drouynianus</i>				+		+				#
Polygonaceae	<i>Rumex</i>	sp.	*		+							
Primulaceae	<i>Lysimachia</i>	<i>arvensis</i>										#
Proteaceae	<i>Banksia</i>	<i>attenuata</i>			+	+						#
	<i>Banksia</i>	<i>grandis</i>								+		
	<i>Banksia</i>	<i>ilicifolia</i>			+	+						#
	<i>Hakea</i>	<i>amplexicaulis</i>						+	+			
	<i>Xylomelum</i>	<i>occidentale</i>				+						#
Restionaceae	<i>Desmocladius</i>	<i>fasciculatus</i>						+	+			
	<i>Desmocladius</i>	<i>flexuosus</i>								+		
	<i>Hypolaena</i>	<i>exsulca</i>							+		+	
	<i>Loxocarya</i>	<i>cinerea</i>			+			+				
Rubiaceae	<i>Opercularia</i>	<i>echinocephala</i>						+				
	<i>Opercularia</i>	<i>hispidula</i>								+		
Stylidiaceae	<i>Stylidium</i>	<i>?spathulatum</i>			+	+						
	<i>Stylidium</i>	<i>amoenum</i>				+		+				
	<i>Stylidium</i>	<i>repens</i>			+							
	<i>Stylidium</i>	<i>loweriana</i>										#
Unknown	Indet.	HA15						+				
Unknown	Indet.	HA32			+	+						
Xanthorrhoeaceae	<i>Chamaescilla</i>	<i>corymbosa</i>			+	+	+	+				#
	<i>Xanthorrhoea</i>	<i>gracilis</i>						+		+		
	<i>Xanthorrhoea</i>	<i>preissii</i>						+		+	+	
Zamiaceae	<i>Macrozamia</i>	<i>riedlei</i>			+		+	+				

†Species recorded in previous survey by Eco Logic Environmental Services (2013).

Appendix F: Quadrat details

Note: All coordinates for quadrats are for north west corner and provided in GDA 94 Zone 50. Height and cover recorded for dominant species only. Opp – species recorded opportunistically in community outside of formal quadrats.

Site	1	Easting	327515
Date	15/9/2018	Northing	6265897
Recorder	Lisa Chappell	Landscape position	Upper slope
Soil	Orange/brown lateritic gravel and sand	Condition	Very good
Community	Woodland of <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> and <i>Allocasuarina fraseriana</i> over open shrubland of <i>Hibbertia hypericoides</i> , <i>Kingia australis</i> , <i>Xanthorrhoea gracilis</i> and <i>Podocarpus drouynianus</i> over sparse sedgeland of <i>Schoenus</i> sp. and open forbland of <i>Dampiera linearis</i> , <i>Chamaescilla corymbosa</i> and <i>Scaevola calliptera</i>		
Genus	Species	Height (m)	% Cover
<i>Allocasuarina</i>	<i>fraseriana</i>	10	2
<i>Amphipogon</i>	sp.		+
<i>Anarthria</i>	<i>prolifera</i>		opp
<i>Avena</i>	sp.		opp
<i>Burchardia</i>	<i>congesta</i>		+
<i>Caladenia</i>	<i>flava</i>		+
<i>Chamaescilla</i>	<i>corymbosa</i>		+
<i>Chorizema</i>	<i>rhombeum</i>		+
<i>Conostylis</i>	<i>setosa</i>		+
<i>Corymbia</i>	<i>calophylla</i>	20	5
<i>Dampiera</i>	<i>linearis</i>		+
<i>Desmocladius</i>	<i>fasciculatus</i>		+
<i>Drosera</i>	<i>stolonifera</i>		+
<i>Eucalyptus</i>	<i>marginata</i>	20	10
Haemodoraceae	sp.		+
<i>Hakea</i>	<i>amplexicaulis</i>		opp
<i>Hibbertia</i>	<i>acerosa</i>		+
<i>Hibbertia</i>	<i>hypericoides</i>	0.5	30
<i>Hovea</i>	<i>chorizemifolia</i>		+
<i>Hypocalymma</i>	<i>angustifolium</i>		opp
<i>Hypochaeris</i>	<i>glabra</i>		+
<i>Kingia</i>	<i>australis</i>	3	5
<i>Lagenophera</i>	<i>huegelii</i>		+
<i>Lomandra</i>	<i>micrantha</i>		+
<i>Lomandra</i>	sp.		+
<i>Macrozamia</i>	<i>riedlei</i>		opp
<i>Mesomelaena</i>	<i>tetragona</i>		+
<i>Opercularia</i>	<i>echinocephala</i>		+
<i>Pentapeltis</i>	<i>peltigera</i>		+
<i>Podocarpus</i>	<i>drouynianus</i>		opp
<i>Scaevola</i>	<i>calliptera</i>		+
<i>Stylidium</i>	<i>amoenum</i>		+
<i>Tetralia</i>	<i>capillaris</i>		+
<i>Tetralia</i>	<i>octandra</i>		+
<i>Xanthorrhoea</i>	<i>gracilis</i>		+
	<i>candida</i>		+
<i>Xanthosia</i>			



Site	2	Easting	327572
Date	15/9/2018	Northing	6265862
Recorder	Lisa Chappell	Landscape position	Upper slope
Soil	Orange/brown lateritic gravel and sand	Condition	Very good
Community	Woodland of <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> and <i>Allocasuarina fraseriana</i> over open shrubland of <i>Hibbertia hypericoides</i> , <i>Kingia australis</i> , <i>Xanthorrhoea gracilis</i> and <i>Podocarpus drouynianus</i> over sparse sedgeland of <i>Schoenus</i> sp. and open forbland of <i>Dampiera linearis</i> , <i>Chamaescilla corymbosa</i> and <i>Scaevola calliptera</i>		
Genus	Species	Height (m)	% Cover
?Ptilotus	manglesii		+
Agonis	flexuosa		opp
Allocasuarina	fraseriana	12	20
Billardiera	variifolia		+
Caesia	micrantha		+
Caladenia	flava		+
Corymbia	calophylla	15	35
Dampiera	linearis		+
Desmocladius	fasciculatus		+
Drosera	stolonifera		+
Eucalyptus	marginata	15	5
Hakea	amplexicaulis	1.8	1
Hibbertia	hypericoides	0.5	4
Hypochaeris	glabra		+
Lagenophera	huegelii		+
Leucopogon	capitellatus		+
Lomandra	sp.		+
Loxocarya	cinerea		+
Macrozamia	riedlei		+
Mesomelaena	tetragona		+
Neurachne	alopeuroidea		+
Nyctasia	floribunda		opp
Pentapeltis	peltigera		+
Podocarpus	drouynianus	1.8	1
Pterostylis	sp. Crinkled leaf		+
Schoenus	sp.	0.5	3
Tetralia	octandra		+
Tetrarrhena	laevis		+
Xanthorrhoea	gracilis	0.5	5
Xanthorrhoea	preissii	1.8	0.5
Xanthosia	candida		+
Indet.	HA15		+



Site	3	Easting	327741
Date	15/9/2018	Northing	6265878
Recorder	Lisa Chappell	Landscape position	Valley floor
Soil	Dark grey sand	Condition	Very good
Community	Closed shrubland of <i>Homalospermum firmum</i> and <i>Astartea fascicularis</i> over sedgeland of <i>Baumea vaginalis</i> .		
Genus	Species	Height (m)	% Cover
Anarthria	prolifera		+
Anigozanthus	sp.		+
Astartea	fascicularis	3	30
Baumea	vaginalis	2	15
Cassytha	sp.		+
Cyathea	?cooperi		opp
Dasypogon	bromelifolius		opp
Eucalyptus	marginata	20	30
Homalospermum	firmum	3	50
Hypolaena	exsulca		opp
Kingia	australis		opp
Kunzea	glabrescens		opp
Kunzea	recurva		opp
Leucopogon	australis		+
Lyginia	barbata		opp
Mirbelia	dilitata		opp
Pteridium	esculentum		opp
Xanthorrhoea	preissii		+



Photo Site 3

Site	4	Easting	327751
Date	15/9/2018	Northing	6265931
Recorder	Lisa Chappell	Landscape position	Valley floor
Soil	Black sandy loam	Condition	Degraded/good
Community	Closed shrubland of <i>Homalospermum firmum</i> and <i>Astartea fascicularis</i> over sedgeland of <i>Baumea vaginalis</i> (Disturbed).		
Genus	Species	Height (m)	% Cover
Allocasuarina	fraseriana	20	5
Anarthria	prolifera		opp
Caladenia	flava		opp
Cyathea	?cooperi		opp
Dasyogon	bromeliifolius		opp
Eucalyptus	patens		opp
Hypocalymma	robustum		opp
Kingia	australis		opp
Kunzea	glabrescens	2.5	2
Pteridium	esculentum	1.8	85
Zantedeschia	aethiopica		opp




Photo Site 4

Site	5	Easting	327882
Date	15/9/2018	Northing	6265957
Recorder	Lisa Chappell	Landscape position	Lower slope
Soil	Dark brown clay loam	Condition	Very good
Community	Tall open forest of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over open woodland of <i>Banksia grandis</i> over open shrubland of <i>Kingia australis</i> , <i>Xanthorrhoea preissii</i> , <i>Taxandria parviceps</i> and <i>Xanthorrhoea gracilis</i> and sedgeland of <i>Lepidosperma pubisquamatum</i> and <i>Mesomelaena tetragona</i>		
Genus	Species	Height (m)	% Cover
Agonis	flexuosa		+
Allocasuarina	fraseriana	12	4
Caesia	micrantha		+
Caladenia	flava		+
Corymbia	calophylla	20	55
Eucalyptus	marginata	20	10
Hypochaeris	glabra		+
Hypolaena	exsulca		+
Kingia	australis	5	12
Lepidosperma	pubisquamatum	0.75	50
Lindsaea	linearis		+
Lomandra	nigricans		+
Mesomelaena	tetragona	0.75	5
Patersonia	occidentalis		+
Pentapeltis	peltigera		+
Pteridium	esculentum	1.25	5
Taxandria	parviceps		+
Tetralia	capillaris		+
Tetralia	octandra		+
Tetrarrhena	laevis		+
Xanthorrhoea	gracilis	0.75	6



Photo Site 5

Site	6	Easting	327334
Date	15/9/2018	Northing	6266078
Recorder	Lisa Chappell	Landscape position	Mid slope
Soil	Grey-white sand	Condition	Good
Community	Open forest of <i>Banksia attenuata</i> , <i>B. ilicifolia</i> and <i>Agonis flexuosa</i> over open shrubland of <i>Kunzea glabrescens</i> over grassland of <i>Briza</i> minor with sparse forbland of <i>Chamaescilla corymbosa</i> and <i>Hypochaeris glabra</i> .		
Genus	Species	Height (m)	% Cover
Acacia	pulchella		+
Agonis	flexuosa	3	20
Allocasuarina	fraseriana		opp
Avena	sp.		+
Banksia	attenuata	5	30
Banksia	ilicifolia	6	25
Briza	minor		+
Burchardia	congesta		+
Caladenia	flava		+
Chamaescilla	corymbosa	0.05	5
Drosera	micrantha		+
Ehrharta	longiflora		+
Hibbertia	notibractea		+
Hypochaeris	glabra	0.02	1
Indet.	HA32		+
Isotropis	cuneifolia		opp
Kunzea	glabrescens	2	2
Loxocarya	cinerea		+
Nyutsia	floribunda		opp
Quinetia	urvillei		+
Romulea	rosea		+
Rumex	sp.		+
Stylidium	?spathulatum		+
Trachymene	pilosa		+
Ursinia	anthemoides		+



Site	7 (Releve)	Easting	327467
Date	15/9/2018	Northing	6266148
Recorder	Lisa Chappell	Landscape position	Mid slope
Soil	Grey-white sand	Condition	Degraded
Community	Open forest of <i>Allocasuarina fraseriana</i> , <i>Banksia attenuata</i> , <i>B. illicifolia</i> and <i>Agonis flexuosa</i> over sparse shrubland of <i>Podocarpus drouynianus</i> and <i>Taxandria parviceps</i> over sparse forbland of <i>Burchardia congesta</i> , <i>Chamaescilla corymbosa</i> and <i>Ursinia anthemoides</i> .		
Genus	Species	Height (m)	% Cover
Agonis	flexuosa	6	5
Allocasuarina	fraseriana	6	25
Arctotheca	calendula	0.2	1
Banksia	attenuata	6	10
Banksia	illicifolia	6	5
Chamaescilla	corymbosa		+
Eucalyptus	marginata		+
Hypochaeris	glabra	0.02	0.5
Indet.	HA32		+
Nyctasia	floribunda		+
Podocarpus	drouynianus		+
Quinetia	urvillei		+
Sowerbaea	laxiflora		+
Stylidium	?spatulatum		+
Trachymene	pilosa		+
Ursinia	anthemoides	0.5	5
Agonis	flexuosa	6	5



Photo Site 7

Site	8	Easting	327595
Date	15/9/2018	Northing	6266074
Recorder	Lisa Chappell	Landscape position	Mid slope
Soil	Grey-white sand	Condition	Good
Community	Open forest of <i>Allocasuarina fraseriana</i> , <i>Banksia attenuata</i> , <i>B. ilicifolia</i> and <i>Agonis flexuosa</i> over sparse shrubland of <i>Podocarpus drouynianus</i> and <i>Taxandria parviceps</i> over sparse forbland of <i>Burchardia congesta</i> , <i>Chamaescilla corymbosa</i> and <i>Ursinia anthemoides</i> .		
Genus	Species	Height (m)	% Cover
Agonis	flexuosa	5	8
Allocasuarina	fraseriana	6	25
Arctotheca	calendula	0.2	2
Banksia	attenuata	5	2
Briza	minor	0.3	4
Burchardia	congesta		+
Chamaescilla	corymbosa	0.05	1
Drakaea	glyptodon		opp
Ehrharta	longiflora		+
Hypochaeris	glabra		+
Lomandra	nigricans		+
Podocarpus	drouynianus	2	20
Quinetia	urvillei		+
Sonchus	oleraceus		+
Taxandria	parviceps	1.8	5
Ursinia	anthemoides	0.2	2



Photo Site 8

Site	9	Easting	327355
Date	15/9/2018	Northing	6266148
Recorder	Lisa Chappell	Landscape position	Mid slope
Soil	Grey-white sand	Condition	Good
Community	Open forest of <i>Banksia attenuata</i> , <i>B. ilicifolia</i> and <i>Agonis flexuosa</i> over open shrubland of <i>Kunzea glabrescens</i> over grassland of <i>Briza</i> minor with sparse forbland of <i>Chamaescilla corymbosa</i> and <i>Hypochaeris glabra</i> .		
Genus	Species	Height (m)	% Cover
Agonis	flexuosa		+
Allocasuarina	fraseriana	6	2
Banksia	attenuata	6	50
Banksia	ilicifolia	6	5
Briza	minor		+
Burchardia	congesta		+
Chamaescilla	corymbosa	0.05	1
Hypochaeris	glabra	0.05	0.5
Kunzea	glabrescens	1.5	30
Nyctasia	floribunda		+
Pyrorchis	nigricans		+
Quinetia	urvillei		+
Romulea	rosea		+
Stylidium	?spatulatum		+
Stylidium	repens		+



Photo Site 9

Site	10	Easting	327620
Date	15/9/2018	Northing	6266385
Recorder	Lisa Chappell	Landscape position	Mid slope
Soil	Grey-white sand	Condition	Degraded
Community	Open forest of <i>Allocasuarina fraseriana</i> , <i>Banksia attenuata</i> , <i>B. ilicifolia</i> and <i>Agonis flexuosa</i> over sparse shrubland of <i>Podocarpus drouynianus</i> and <i>Taxandria parviceps</i> over sparse forbland of <i>Burchardia congesta</i> , <i>Chamaescilla corymbosa</i> and <i>Ursinia anthemoides</i> .		
Genus	Species	Height (m)	% Cover
Agonis	flexuosa	6	15
Allocasuarina	fraseriana	6	40
Arctotheca	calendula		+
Avena	sp.		opp
Banksia	attenuata	6	30
Banksia	ilicifolia	5	18
Burchardia	congesta	0.2	0.05
Chamaescilla	corymbosa	0.05	0.5
Hypochaeris	glabra		+
Indet.	HA32		opp
Jacksonia	furcellata		opp
Paracaleana	nigrita		+
Pyrorchis	nigricans		+
Quinetia	urvillei		+
Rhodanthe	citrina		opp
Stylidium	amoenum		+
Trachymene	pilosa		opp



Photo Site 10

Site	11	Easting	327715
Date	15/9/2018	Northing	6266027
Recorder	Lisa Chappell	Landscape position	Upper slope
Soil	Grey-white sand	Condition	Degraded-good
Community	Open forest of <i>Banksia attenuata</i> , <i>B. ilicifolia</i> and <i>Agonis flexuosa</i> over open shrubland of <i>Kunzea glabrescens</i> over grassland of <i>Briza minor</i> with sparse forbland of <i>Chamaescilla corymbosa</i> and <i>Hypochaeris glabra</i> .		
Genus	Species	Height (m)	% Cover
Agonis	flexuosa		opp
Arctotheca	calendula		+
Avena	sp.		+
Banksia	ilicifolia	5	30
Briza	minor	0.3	15
Burchardia	congesta		+
Caladenia	flava		opp
Chamaescilla	corymbosa		+
Dasyogon	bromeliifolius		+
Drosera	micrantha		+
Hibbertia	hypericoides		+
Hypochaeris	glabra	0.05	2
Indet.	HA32		+
Kunzea	glabrescens	3	25
Lyginia	barbata		+
Macrozamia	riedlei		opp
Melaleuca	?systema	0.7	10
Nyctia	floribunda		opp
Soliva	pterosperma		+
Ursinia	anthemoides	0.2	1
Zantedeschia	aethiopica		opp



Photo Site 11

Site	12(Releve)	Easting	327814
Date	12/10/2018	Northing	6266011
Recorder	Mike Braimbridge	Landscape position	Mid slope
Soil	Grey sand	Condition	Degraded-good
Community	Open forest of <i>Agonis flexuosa</i> and <i>Allocasuarina fraseriana</i> over open shrubland of <i>Kunzea glabrescens</i> over grassland of <i>Briza maxima</i> and <i>Anthoxanthum odoratum</i> and sparse forbland of <i>Arctotheca calendula</i> , <i>Chamaescilla corymbosa</i> , <i>Burchardia congesta</i> and <i>Ursinia anthemoides</i> .		
Genus	Species	Height (m)	% Cover
Agonis	flexuosa	8	55
Allocasuarina	fraseriana	8	10
Anthoxanthum	odoratum		+
Arctotheca	calendula		+
Avena	sp.		+
Briza	maxima		+
Burchardia	congesta		+
Chamaescilla	corymbosa		+
Geranium	solanderi		+
Hypochaeris	glabra		+
Kunzea	glabrescens		+
Lyginia	barbata		+
Macrozamia	riedlei		+
Romulea	rosea		+
Soliva	pterosperma		+
Ursinia	anthemoides		+
NA			
Photo Site 12			

Site	13	Easting	327910
Date	12/10/2018	Northing	6265891
Recorder	Mike Braimbridge	Landscape position	Lower slope
Soil	Brown sandy loam	Condition	Very good
Community	Tall open forest of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over open woodland of <i>Banksia grandis</i> over open shrubland of <i>Kingia australis</i> , <i>Xanthorrhoea preissii</i> , <i>Taxandria parviceps</i> and <i>Xanthorrhoea gracilis</i> and sedgeland of <i>Lepidosperma pubisquamatum</i> and <i>Mesomelaena tetragona</i>		
Genus	Species	Height (m)	% Cover
Acacia	divergens		+
Acacia	pulchella		+
Anthoxanthum	odoratum		+
Banksia	grandis	8	5
Caladenia	latifolia		+
Corymbia	calophylla	30	50
Desmocladius	fasciculatus		+
Desmocladius	flexuosus		+
Eucalyptus	marginata	30	25
Hakea	amplexicaulis		+
Hibbertia	hypericoides		+
Hypocalymma	angustifolium		+
Hypochaeris	glabra		+
Hypolaena	exsulca		+
Kingia	australis	3	1
Lagenophera	huegelii		+
Lepidosperma	squamatum		+
Mesomelaena	tetragona		+
Opercularia	hispidula		+
Patersonia	occidentalis		+
Pentapeltis	peltigera		+
Pterostylis	pyramidalis		+
Pterostylis	sp. Crinkled leaf		+
Taxandria	parviceps		+
Tetraria	capillaris		+
Tetraria	octandra		+
Tetrarrhena	laevis		+
Xanthorrhoea	gracilis	0.5	3
Xanthorrhoea	preissii	2	3
NA			
Photo Site 13			

**HYDROGEOLOGICAL ASSESSMENT
EXTRACTIVE INDUSTRIES APPROVAL**

For

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TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 Location	1
1.2 Proposed Development & Project Particulars	1
2. LOCALITY DESCRIPTION	2
2.1 Topography	2
2.2 Drainage	2
2.3 Vegetation	2
2.4 Climate/Rainfall	2
3. HYDROGEOLOGY	4
3.1 Local Geology	4
3.2 Groundwater Investigations	5
3.3 Maximum Seasonal Groundwater Level	5
3.4 Flow Direction	6
4. EXISTING GROUNDWATER USE	7
4.1 Licensed Groundwater Users	7
4.2 Groundwater Dependent Ecosystems	7
5. RISK ASSESSMENT	8
6. MANAGEMENT APPROACH	11
6.1 Water Management Plan	11
7. CONCLUSIONS	13
8. REFERENCES	14
9. LIMITATIONS OF REPORT	15

LIST OF TABLES

Table 1	Rainfall Data – Jindong (9978)
Table 2	Extractive Industry Site Geology
Table 3	Licensed Water Users
Table 4	Proposed Monitoring Bores

LIST OF FIGURES

Figure 1	Site Map - Overview
Figure 2	Site Map - Lot 157
Figure 3	Jindong Rainfall, EW12C, Water Levels and Site Water Levels
Figure 4	Contours – Maximum Seasonal Groundwater Levels
Figure 5	Contours – Base of Sand
Figure 6	Contours – Base of Sand and Maximum Seasonal Groundwater Differential

1. INTRODUCTION

1.1 Location

It is proposed to extract sand from the southern one-third of 157 Haag Road, Yelverton, located approximately 19 kilometres southwest of Busselton, Western Australia (Figure 1).

1.2 Proposed Development & Project Particulars

The proposed extractive industry, sand for building, will be located on 12 hectares of degraded Banksia woodland (Figure 2).

The development plan is to initially remove and stockpile between 100mm and 150mm of topsoil. The sand layer, up to 1.5m thick will then be removed.

Up to 150mm of topsoil will be reinstated on top of the sands and then sown with grasses for pasture.

The central part of 157 Haag Road was previously mined for sand and the property immediately to the east has been extensively mined for sand.

2. LOCALITY DESCRIPTION

2.1 Topography

The proposed extractive industry site is located just to the south of the southern edge of the Whicher Scarp on the Yelverton Shelf (Schafer *et al* 2008). The site is gently sloping with the sand extraction site forming a watershed.

The proposed extractive industry site slopes very gradually to the west north-west and at Haag Road the elevation is about 52m AHD with the highest point on the property being just above 68m AHD (Figure 2). The high point is the catchment watershed between the Annie Brook and Mary Brook catchments.

Figure 2 indicates that the northern end of the property is linked to the headwaters of Annie Brook.

2.2 Drainage

Lot 157 Haag Road sits on the Yelverton Shelf. The area to be mined forms the watershed between two catchments with surface drainage on the site heading either to the northwest to Annie Brook or the southeast towards Mary Brook.

The proposed extractive industry site has no natural drainage due to the high porosity of the surface sands. Rainfall drains directly into the surficial sediments and then enters the water table.

2.3 Vegetation

The vegetation of the sand mining site is degraded "Banksia" woodland. A separate report by Stream, Environment and Water covers an assessment of the flora and fauna.

2.4 Climate/Rainfall

The Haag Road area experiences a typically Mediterranean climate, characterised by cool, wet winters and warm, dry summers. The nearest meteorological station is at Jindong (9978), located 7.5km to the southeast of Haag Road, for which a reliable rainfall recording commenced in 2002.

157 Haag Road, Yelverton
Hydrogeological Assessment

The average annual rainfall at Jindong is approximately 775.7 mm with most rainfall being recorded during the months of May through to September. Rainfall exceeds potential evaporation only during May to August. The monthly rainfall averages and the monthly rainfall for 2018 for Jindong are presented in Table 1.

Table 1
Rainfall Data – Jindong (9978)

Month	Average (mm)	2018	2019
January	11.0	25.6	30
February	5.2	1.0	1.4
March	18.1	14.8	33.4
April	35.5	8.6	27.6
May	111.9	112.6	35.2
June	132.0	145.4	245.2
July	152.1	160.8	109
August	124.7	164.6	122.2
September	91.0	29.4	42.8
October	37.3	37.0	55
November	31.5	8.0	11.8
December	11.6	15.2	4.6
Total	775.7	723.0	708.2

Jindong (9978) rainfall figures, as supplied by the Bureau of Meteorology, for 2018 and 2019 show them to be below average years.

3. HYDROGEOLOGY

3.1 Local Geology

The proposed extractive industry site and the surrounding area is part of the southern Perth Basin. Schafer et al (2008) indicates that the Dunsborough Fault is located about 1.5 kilometres to the west of the site and demarcates the western boundary of the Perth Basin.

The proposed extractive industry site is underlain by the Leederville Formation which is in turn underlain by the Sue Coal Measures. The Leederville Formation in this area is composed of six members. The outcropping member is the Quindalup Member and extends to about 10m AHD or about 58m. The following table shows the order and suggested depths of the Leederville Formation members and Sue Coal Measures.

Table 2
Extractive Industry Site Geology

Lithology	Thickness (m)	Depth of Base (m below ground level)	Depth of Base (m AHD)
Quindalup Member	58	58	0
Upper Mowen Member	5	63	-5
Lower Mowen Member	5	83	-15
Upper Vasse Member	10	93	-25
Lower Vasse Member	35	128	-60
Yelverton Member	10	138	-70
Sue Coal Measures	>70	-	-

The proposed extractive site will only affect the surficial one to three metres so the only the Quindalup Member will be described.

The Quindalup Member at Haag Road extends to 0m AHD or 60m. The unit typically comprises a fine-grained sequence of organic black clays with minor lignite seams and green glauconitic clay. The sand that is proposed to be extracted is a surficial layer probably composed of the weathering products of the Quindalup Member. The upper parts of the Quindalup Member close to the Dunsborough Fault in the Haag Road area are considered to be the sandier facies which when weathered would provide the clean white target sands.

In the Haag Road area, the sands underlie a thin sandy soil layer, up to 0.4m thick. The target sands lie immediately below the soil and extend to depths of 2.15m below ground level. Below the base of the target sands will be the sandy facies of the Quindalup Member which have a considerably higher clay content than the target sands and would constitute an aquitard.

3.2 Groundwater Investigations

Four sites were converted to piezometers to enable the determination and recording of standing water levels and each site was surveyed so that measured water levels could be converted to m AHD. The southwestern site was always dry at a depth of 4.26m (62.506m AHD). The bore locations and contoured maximum measured water levels plus 0.2m (Maximum Seasonal Groundwater Level), of the highest recorded groundwater level, measured on 24 August 2018, are shown on Figure 4.

Water level data was measured weekly from 17 August to 30 November 2018 and from 26 July to 29 November 2019 by the property owner to assist in determining a maximum seasonal groundwater level.

3.3 Maximum Seasonal Groundwater Level

The Maximum Seasonal Groundwater Level is the highest normal water level in the annual cycle period. In the Yelverton region this is generally experienced in the surficial aquifer between July and October and is the result of rainfall recharge raising the water level in the shallow aquifer.

A review of the available Department of Water and Environmental Regulation monitoring bore data was made to identify bores with similar geological characteristics to the Haag Road site. The closest three bores were BN23S, 3.7km to the north west, BN24S, 5.5km to the north east and EW12C, 6.2km to the south east. The two Busselton Shallow bore were constructed in the deeper surficial formations aquifer on the Coastal Plain and therefore not considered similar geology and rejected.

The EW12C bore was drilled through 3.65m of the surficial aquifer and then into the Leederville Formation aquifer on the Whicher Scarp in lithologies considered

similar to the Haag Road site. No other shallow monitoring bores are located on the Yelverton Shelf in the vicinity of Haag Road so comparison sites are limited.

The Jindong rainfall since 2010, the water level data for EW12C and the site bores have been plotted on Figure 3 to demonstrate the relationship between the rainfall and the water level.

It was identified that the Haag Road highest site water level was measured on 24 August 2018 which is just before the highest water level recorded in EW12C in 2018. The EX12C maximum water levels are generally recorded just after 24 August each year (Figure 3). The May to August 2018 rainfall of 580mm was recorded at Jindong.

In 2019, the Haag Road site maximum water levels were about 0.7m lower than the 2018 water levels even though the May to August 2019 Jindong rainfall was over 510mm.

The longer-term Jindong rainfall and EW12C data was plotted to determine if 2018 was a reasonably normal year. The 24 August 2018 EW12C water levels were found to be about 0.3m lower than the maximum recorded water levels that were observed in 2013, 2015 and 2016.

The maximum seasonal groundwater levels at Haag Road were determined to be higher than the water levels recorded at the site on 24 August 2018. A correction of +0.2m was added to the water levels used in this exercise to determine the maximum seasonal groundwater level at Haag Road.

3.4 Flow Direction

The shallow aquifer groundwater flow direction in the proposed extractive industry site mainly to the southeast towards Mary Brook following the topographic profile. A small component between the northeast and northwest monitoring sites may flow northwest towards Annie Brook.

4. EXISTING GROUNDWATER USE

4.1 Licensed Groundwater Users

There are seven licensed groundwater users and three licensed surface water users within 1 kilometre of the proposed extractive industry site. The following table shows summary details of the licenses.

Table 3
Licensed Water Users

Licence Type & Number	Owner	Allocation (kL)	Aquifer
GWL54396	R Credaro	111,000	Perth-Superficial Swan
GWL57935	R Credaro	240,000	Perth-Leederville
GWL151829	Quiraing Trading Pty Ltd	45,000	Perth-Superficial Swan
SWL168324	P Rouw	10,600	Dunsborough Coast
SWL169862	Jelcross Holdings Pty Ltd	55,000	Dunsborough Coast
SWL170947	Quiraing Trading Pty Ltd	31,500	Dunsborough Coast
GWL74215	R Clark, IJ & MM Fleming	650	Perth-Leederville
GWL174813	Cobcroft Wines Pty Ltd	28,000	Perth-Blackwood Surficial
GWL76791	JR Halliday	1,500	Perth-Leederville
GWL202005	SW Threadgold)	3,000	Perth-Leederville

None of these licensed user's aquifers or water sources will be affected by the proposed extractive site operations.

4.2 Groundwater Dependent Ecosystems

To the north of the proposed Haag Road extraction site is a conservation category wetland (12282) attached to the Haag Road Nature Reserve. Parts of this conservation category wetland are already licensed for surface water and groundwater abstraction. The proposed extractive industry site may result in increased runoff which could increase silt loading in Annie Creek but management of the runoff by channelling runoff into existing dams will minimise any effects.

5. RISK ASSESSMENT

A major risk of the sand extraction would be extracting below the water table especially in the months of August and September when the maximum seasonal groundwater tables are highest. To determine the risk a series of figures, 4, 5 and 6, have been produced to demonstrate the maximum seasonal groundwater table, the base of the extractive sand and the differential between them. Table 4 shows the raw data used to create the contours.

A survey was undertaken in August 2020 by Survey South to determine topographic elevations for the site. The contoured data is shown on Figure 2.

Figure 4 shows the groundwater level measured on 24 August 2018 with a safety factor of 0.2m added as determined from the EW12C bore long-term groundwater levels.

Figure 5 shows the base of the extractive sand as determined by the mining contractor during testing using the Survey South elevations. The majority of the area being extracted has the base of the sand between 63 and 65m AHD.

Figure 6 shows the differential between the Maximum Seasonal Groundwater Level (+0.2m) and the Base of the Sand Layer. The contoured data indicates that base of the sand at Test Pit 1 could be up to 0.95 metre below the Maximum Seasonal Groundwater Level.

The current DWER recommendations for water resource considerations for extractive industries are: *- If dewatering is not proposed, the distance between the base of the proposed excavation and the maximum seasonal groundwater level will be determined through the land planning process. The minimum acceptable separation is 300mm, however depending on the degree of confidence in the data and the analysis used to determine the maximum seasonal groundwater level, and the proximity of any high value resources, this distance may need to be greater.*

The Test Pit 4 base of resource will be 0.25m above the Maximum Seasonal Groundwater Level and Test Pit 2 base of resource will be 0.55m above the Maximum Seasonal Groundwater Level. To determine the maximum seasonal groundwater level at this site an additional 0.2m has been added as a safety margin

to the 2018 groundwater levels therefore the area around Pit 4 is marginal for extraction.

After further water level information is collected each winter/spring and if the maximum seasonal groundwater level is proven to be lower, a decision may be made to include Test Pit 4 and Test Pit 1 in the mining area.

Following the extraction of the resource a 0.15m layer of topsoil will be reinstated which would result in a minimum depth to maximum seasonal groundwater level being slightly in excess of 0.45m.

The following points are related to the extraction and rehabilitation.

1. During the extraction phase the water level will not be lowered or altered and groundwater dependent ecosystems within the wetlands reliant on the water level would be unaffected.
2. The extraction being totally above water table will result in no change to the quantity of water flowing towards the Annie Brook and Mary Brook during the extraction and after the rehabilitation phase.
3. The other source of water quality problems would be failure of earthmoving equipment which could be the cause of pollution due to equipment lubricants and fuels. This is possible and earthmoving contractors are required to carry spill kits etc. to contain and recover any spilled lubricants or fuels. Any lost lubricants or fuels would be diluted significantly before reaching the wetlands.
4. Following rehabilitation there is potential for some ponding of water following significant rainfall events. There is no evidence of ponding in currently mined areas to the north on the site and as the existing topsoil will be reinstated on sands the potential for ponding is limited. The site will still be the water shed between Annie Brook and Mary Brook.

The above information demonstrates that the potential risk of impact on the groundwater dependent ecosystems of the proposed extractive industry is manageable with a suitable water management plan.

157 Haag Road, Yelverton
Hydrogeological Assessment

Table 5
Raw Data used to Create Contours

Point ID	Easting	Northing	Surface mAHD	Base of Sand mAHD	Maximum Recorded SWL mAHD	Maximum Recorded SWL +0.2m mAHD	Differential Base of Sand vs SWL +0.2m mAHD
1	327700	6266568			64	64.2	
2	327700	6266408			63	63.2	
3	327700	6266288			62	62.2	
4	327700	6266175			61	61.2	
5	327700	6266037			60	60.2	
6	327742	6266082			60	60.2	
7	327600	6266050			61	61.2	
8	327500	6266050			62	62.2	
9	327300	6266040			63	63.2	
10	327300	6266100			64	64.2	
11	327300	6266170			65	65.2	
NE Bore	327691.4	6266505			63.784	63.984	
SE Bore	327703	6266058			60.044	60.244	
NW Bore	327312.9	6266234			65.676	65.876	
15	327400	6266265			65	65.2	
16	327500	6266400			65	65.2	
TP1	327577	6266486	65.7	64.05	65	65.2	-0.95
TP2	327565	6266428	66.7	65.05	64.5	64.7	0.55
TP3	327564	6266317	67.75	66.5	63.6	63.8	2.9
TP4	327652	6266496	65.9	64.25	64	64.2	0.25
TP5	327661	6266345	67.5	65.9	62.8	63	3.1
TP6	327663	6266275	67.75	65.6	62.3	62.5	3.3
TP7	327694	6266114	65.35	63.25	60.6	60.8	2.65
TP8	327424	6266108	66.35	64.4	63	63.2	1.4
TP9	327410	6266215	66.75	65.33	64.3	64.5	1.03
TP10	327519	6266307	67.45	66.15	64	64.2	2.15
TP11	327573	6266245	67.6	65.9	63	63.2	2.9
TP12	327600	6266168	67.25	65.15	62	62.2	3.15
TP13	327554	6266149	66.25	64.49	62.3	62.5	2.19
TP14	327465	6266145	66.5	64.7	63	63.2	1.7

6. MANAGEMENT APPROACH

The previous sections have shown that the proposed extractive industry at 155 Haag Road are likely to have minimal to negligible impacts on the groundwater system and that the potential risk of impact on the groundwater dependent ecosystems of the nearby wetlands will be very low.

Only those areas that have been demonstrated to have greater than 0.3m clearance of the maximum seasonal groundwater table can be mined slightly reducing the mined area in along the northwest edge of the proposed area.

6.1 Water Management Plan

The following plan is proposed to monitor the groundwater quality and levels at the proposed extractive industry site.

The existing borefield of shallow monitoring bores, constructed to the guidelines suggested in "Minimum Construction Requirements for Water Bores in Australia" Edition 3. The bores were constructed using 50 mm PVC, with the casing slotted for the final metre, gravel packed and developed. There are four bores, one located each corner. All monitoring bore locations and a relative level at the top of the PVC casing have been surveyed. The following table indicates locations, total depths and slotted casing depths.

**Table 5
Existing Monitoring Bores**

Site ID	Easting	Northing	Total Depth	Slotted Depth
	m	m	m BGL*	m BGL*
MB1	327690	6266505	4	3 - 4
MB2	327310	6266235	4	3 - 4
MB3	327320	6266030	7	6 - 7
MB4	327700	6266060	5	4 - 5

* m BGL = metres below ground level

A weekly water level monitoring program is proposed to further refine the maximum seasonal groundwater level. This program will be commenced immediately that the proposed extractive industry is approved.

157 Haag Road, Yelverton
Hydrogeological Assessment

The water level data is to be recorded weekly and submitted monthly to the Department of Water and Environmental Regulation.

7. CONCLUSIONS

- An extractive industry site is being proposed for Lot 155 Haag Road, Yelverton where it is proposed to extract sand.
- The target sand is shallow and will be extracted from areas with a 0.3m separation from the maximum seasonal groundwater table. The pit floor will then be raised by 150mm using soil.
- The superficial aquifer consisting mainly of sands and clays extends from the surface to about 0m AHD.
- A maximum seasonal groundwater level has been measured at the site but is limited to two years, but using EW12C water level monitoring data is estimated it could be up to 0.2m higher than the 24 August 2018 reading.
- The potential impacts of the proposed extractive industry on the groundwater dependent ecosystems to the north are considered to be very low and therefore manageable.
- A water management plan has been proposed to enable monitoring of the groundwater table before, during and after the extractive industry is in operation to assist in the management.

8. REFERENCES

Hirschberg, K.-J.B., 1989. *Busselton shallow-drilling groundwater investigation, Perth Basin*, Geological Survey of Western Australia. Professional Papers, Report 25, pp17 – 37.

Schafer, D.B., Johnson, S.L. and Kern, A.M. 2008, *Hydrogeology of the Leederville aquifer in the western Busselton-Capel Groundwater Area*, Department of Water, Hydrogeological Report Series, HG31

9. LIMITATIONS OF REPORT

LIMITATIONS ON INTERPRETATION, USE AND LIABILITY OF THIS REPORT

Water Direct Pty Ltd has prepared this report exclusively for Stuart Threadgold, in accordance with generally accepted consulting practice. The work has been undertaken for the client and for review by regulatory agencies.

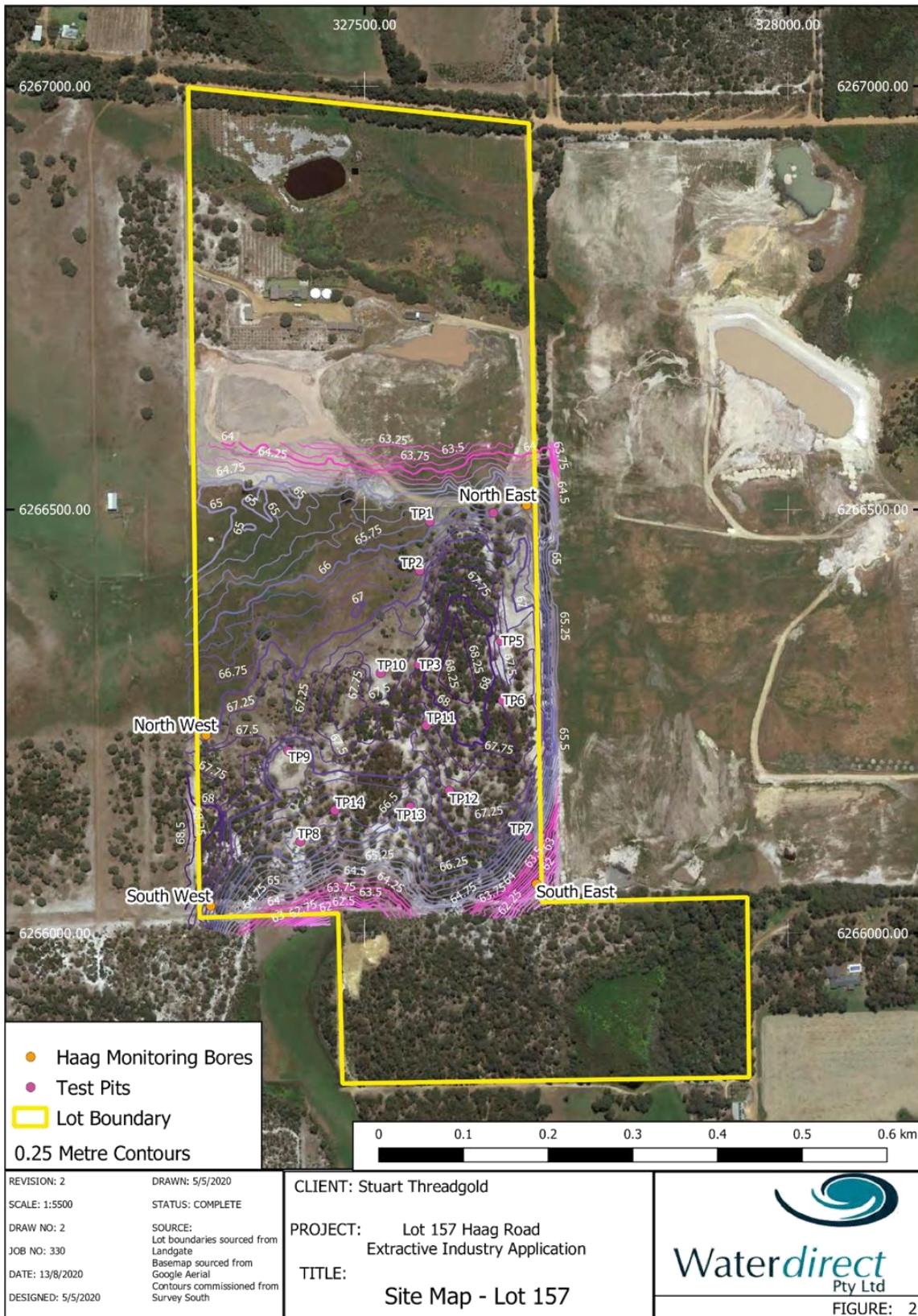
Aquifer materials and groundwater flow systems are a product of continuing natural and manmade processes and thus exhibit a variety of characteristics and properties that vary from place to place and can change with time. Geology/hydrogeology involves gathering and assimilating limited facts about these characteristics and properties in order to understand and predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, drilling, excavation, probing, sampling, testing or other means of investigation, particularly pumping and drawdown data. If so, they are directly relevant only to the groundwater system at the place where, and the time when the investigation was carried out. Any groundwater modelling predictions presented should not be regarded as matters of fact.

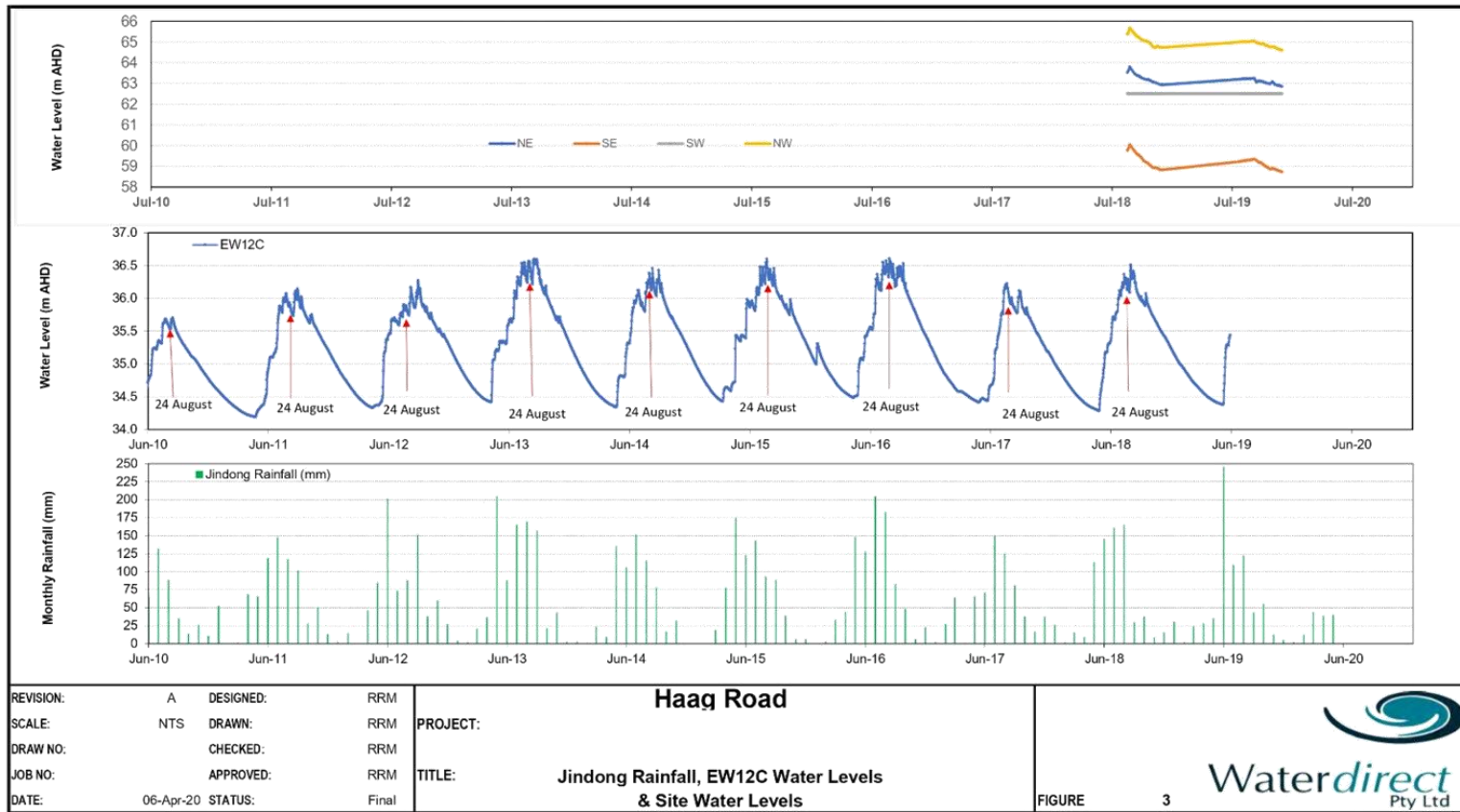
This report and other reports referred to may contain comments on works being carried out by others. The Company cannot and will not take responsibility for works carried out by others on site to date. We do not guarantee the performance of the project in any respect, only that our work and judgement meet the standard of care of our profession at this time.

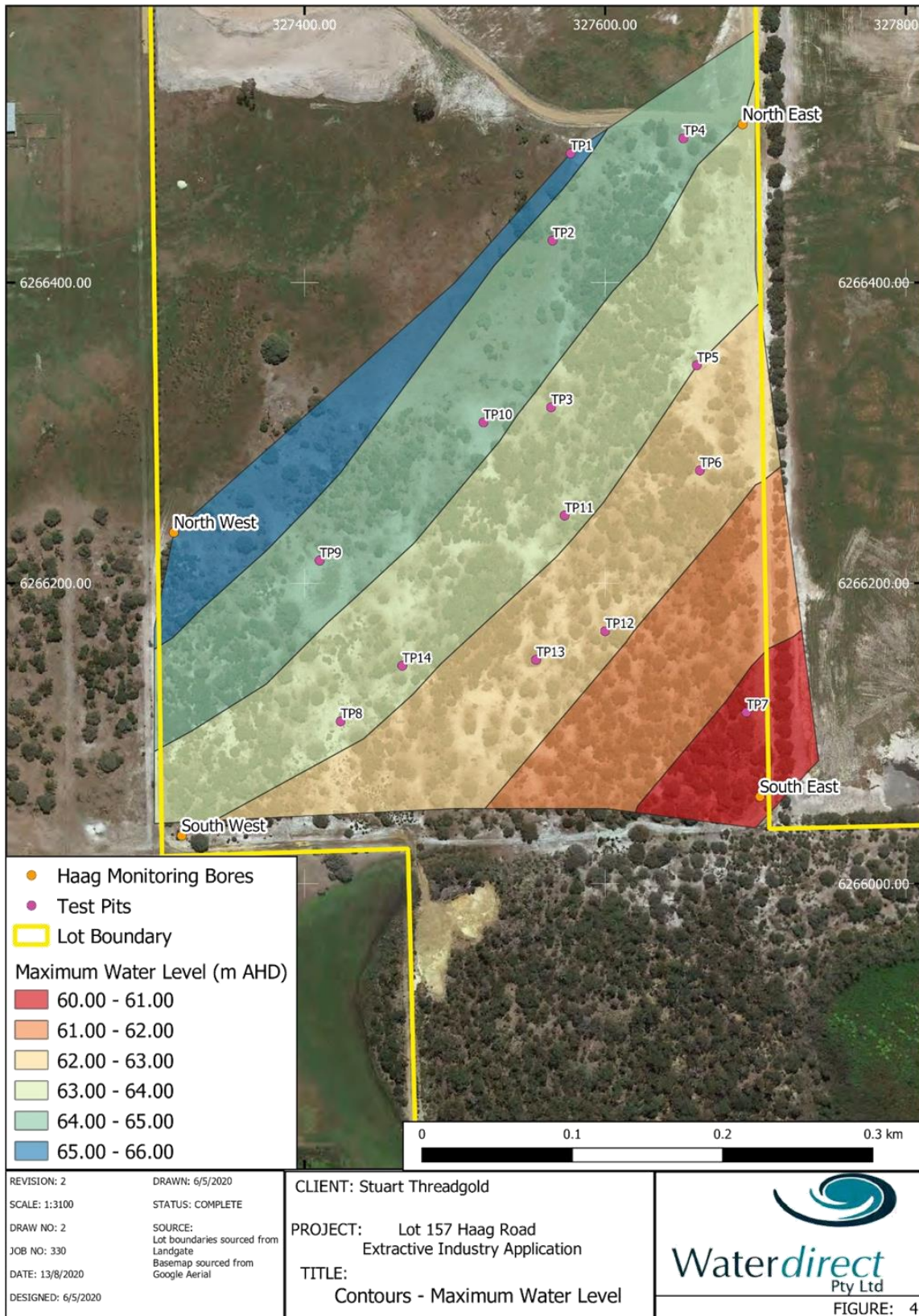
Any interpretation or recommendation given in this report shall be understood to be based on judgement and experience, not on greater knowledge of facts other than those reported.

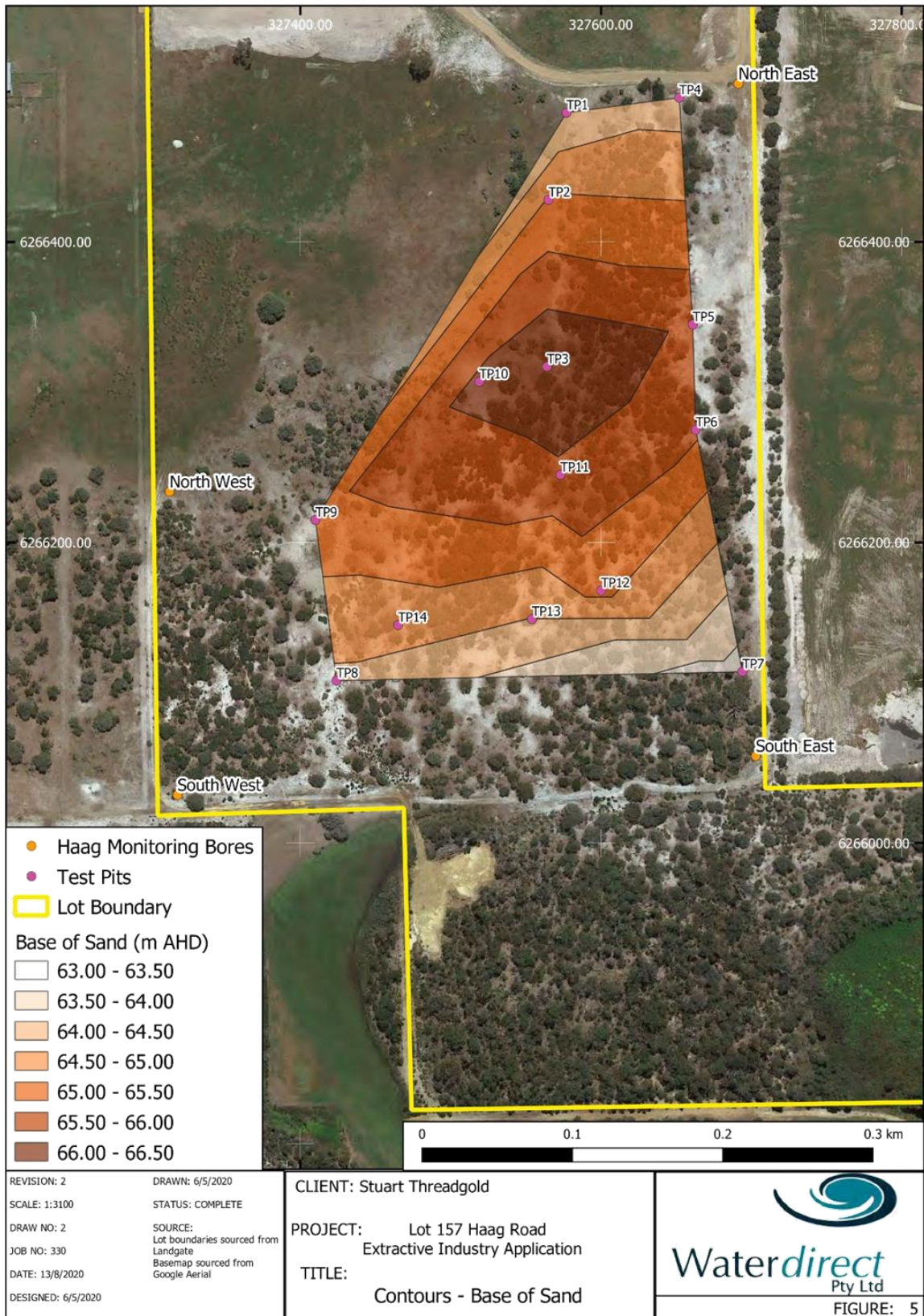
FIGURES

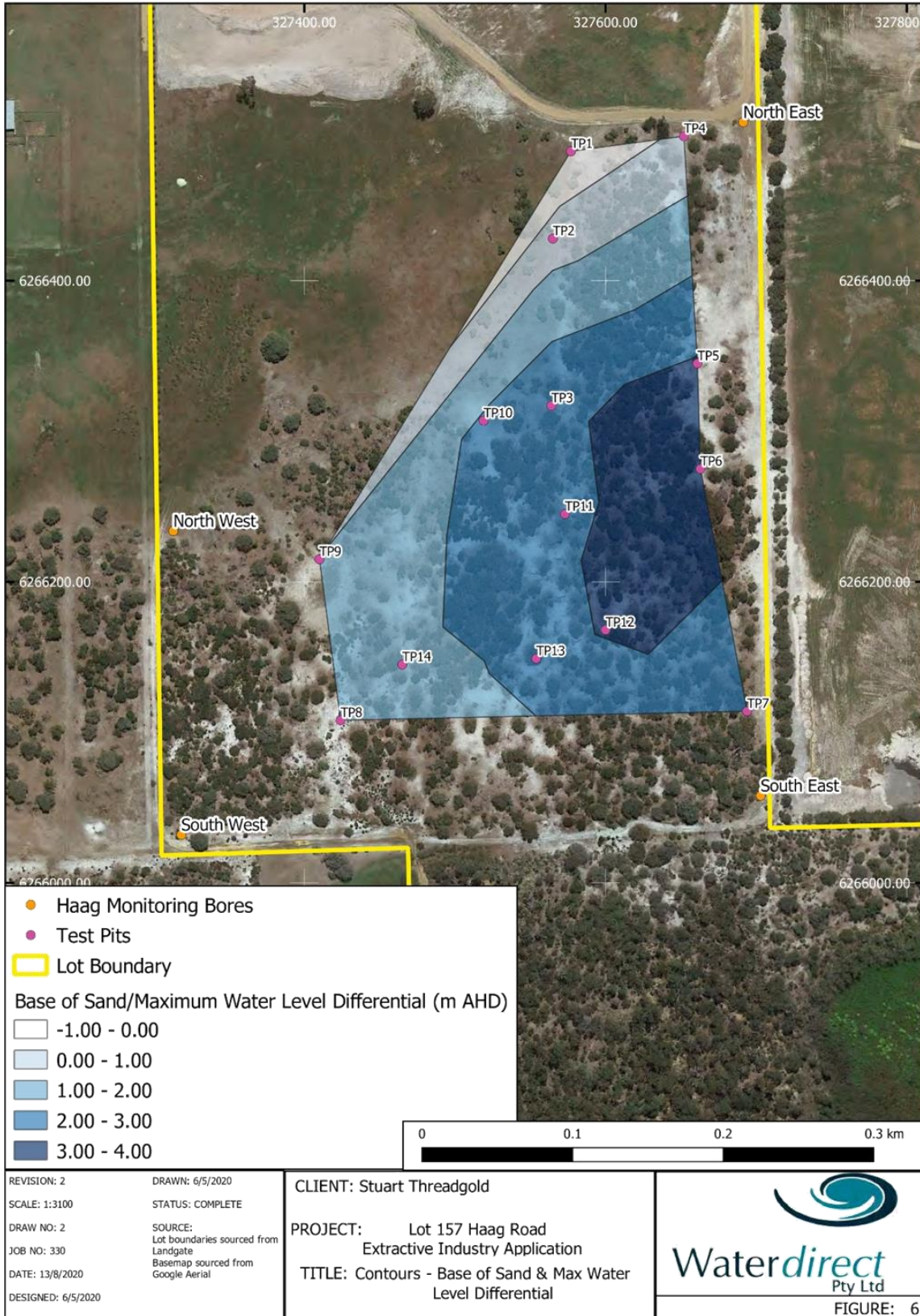












Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

OPERATIONS ENVIRONMENT MANAGEMENT PLAN (SAND EXTRACTION)

LOT 785 HAAG ROAD, YELVERTON



Version 2 Update **16 October 2021**

CONTENTS

1.0	INTRODUCTION	5
1.1	Purpose of the Operations Environmental Management Plan (OEMP)	5
1.2	Scope of the Operations Environmental Management Plan	5
2.0	SUMMARY PROJECTION DESCRIPTION	6
2.1	Site Layout, Facilities and Traffic Management	6
2.2	Project Staging	6
2.2.1	Vegetation Removal (where required)	6
2.2.2	Topsoil Removal	7
2.2.3	Sand Extraction	7
2.2.4	Volume of Sand	7
2.2.5	Pit Form	7
2.2.6	Equipment	7
3.0	ENVIRONMENTAL MANAGEMENT RESPONSIBILITIES	9
3.1	Environmental Management During Operations	9
3.1.1	Noise and Dust Management	9
3.1.2	Road Monitoring	9
3.1.3	Site Drainage, Water Quality Control	10
3.1.4	Quarantine – Dieback and Weeds	11
3.1.5	Flora and Fauna, Site Buffering and Rehabilitation	12
4.0	IMPLEMENTATION	13
4.1	Organisational Structure, Roles and Responsibilities	13
4.2	Contractual Controls	13
4.3	Environmental Monitoring and Incident Records	14
4.4	Reports	14
4.5	Documentation	14
4.6	Management of Complaints	14
4.7	Training	15
4.8	Review	15
5.0	COMMITMENTS REGISTER	16

TABLES

Table 1:	Noise and dust management responsibilities	9
Table 2:	Transport management responsibilities	10
Table 3:	Water management responsibilities	10
Table 4:	Dieback and weed management responsibilities	11
Table 5:	Flora and vegetation management responsibilities	12
Table 6:	On siteroles and responsibilities	13

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

Table 7: Contractual arrangements	13
Table 8: Monitoring requirements	14
Table 9: Reporting requirements.....	14
Table 10: Commitments register	16

ATTACHMENTS - DOCUMENTATION

- Harewood G, 2019, *Targeted Fauna Assessment, Lot 75 Haag Road Yelverton.*
- Stream Environment and Water, 2018, Flora and Vegetation Assessment. Lot 75 Haag Road, Yelverton, Survey of Proposed Sand Extraction Areas. *Lot 75 Haag Road, Yelverton.*
- Survey South 2020, *Feature Survey and Contour Plan of Lot 75 Haag Road Yelverton.*
- Threadgold Architecture, 2021, *Development Application (Sand Extraction) – Social Impact Assessment, Lot 75 Haag Road.*
- Threadgold Architecture, 2021, *Operations Environmental Management Plan – Sand Extraction, Yelverton.*
- Water Direct Pty Ltd, August 2020 V2, Hydrogeological Assessment Extractive Industries Approval, for S and C Threadgold, 157 Haag Road Yelverton.
- Landform Research 2021, Proposed Sand Excavation, Closure and Rehabilitation Plan, Lot 75 Haag Road, Yelverton.

ABBREVIATIONS

AHD	Australian Height Datum
ALARP	As low as reasonably practical
CALM	Department of Conservation and Land Management
City	City of Busselton
DBCA	Department of Biodiversity, Conservation and Attractions
DEP	Department of Environment Protection
DER	Department of Environment Regulation
DME	Department of Mines and Energy
DWER	Department of Water and Environmental Regulation
DEC	Department of Environment and Conservation
DPaW	Department of Parks and Wildlife
EPA	Western Australian Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
Ha	Hectares (10,000 square meters)
MRWA	Main Roads Western Australia

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

PTA Public Transport Authority
PC Permit to Commence
RAMSAR International Convention on Wetlands, signed in Ramsar, Iran (1971)
Yd Yelverton (dry) forest type
Yw Yelverton (wet) forest type

Input has been provided by Landform Research



Landform Research

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Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

1.0 INTRODUCTION

1.1 Purpose of the Operations Environmental Management Plan (OEMP)

The purpose of the OEMP is to identify the management approach which will be implemented during the planning, extraction and rehabilitation activities on-site at Lot 75 Haag Road, Yelverton. The management measures in the OEMP are aimed at minimising the amenity and environmental issues presented by an operating sand extraction concern within the local area.

The OEMP is to be used to manage the operation and is therefore written to be simple, practical and manageable for all stake holders and site personnel. The OEMP is not intended to document every scenario but rather to provide a framework for management of decision-making and general environmental awareness.

1.2 Scope of the Operations Environmental Management Plan

The scope covers all activities related to the extraction of sand from the site, including; onsite extraction, ancillary works, haulage of material to point of sale and off-site public works such as the recent \$178,000 road upgrade to the haulage route of Haag Road.

2.0 SUMMARY PROJECTION DESCRIPTION

This report section describes the activities, project layout and the project parameters and details environmental training, who is responsible for the extractive industry operation and the records to be maintained during the life of the operation.

2.1 Site Layout, Facilities and Traffic Management

The site has been laid out to accommodate a very low level of site presence and is in fact completely visually screened from all public roads in order to minimise the development on all adjacent land users.

Access to the site is provided by Haag Road which was upgraded by the pit operator at a cost to the property owner of \$178,000. Haag Road discharges onto Chambers Road which has been used for in excess of 15 years by the owners of Lot 4079 Chambers Road, Yelverton to deliver sand into the local civil and construction markets. Main Roads Western Australia (MRWA) has confirmed that the access point onto Bussell Highway is suitable for the proposed haulage activities.

A description of the transport and potential social impacts is provided at Section 5.3.4 Transport and Infrastructure in the Social Impact Assessment.

2.2 Project Staging

Extraction shall be conducted across 3 cells of approximately 2 ha, 2 ha and 1 ha.

The process is described in the attached Closure and Rehabilitation Plan and includes:

- a. removing large vegetation from each cell, including mulching or harvesting firewood for the owners hot water booster;
- b. removing approx. 100mm topsoil from each cell and stockpiling for re-use during rehabilitation;
- c. excavating and removing sand from each cell (indicatively to 2m extraction depth);
- d. returning topsoil over each cell and commencing rehabilitation progressively.

2.2.1 Vegetation Removal (where required)

The process is described in the attached Closure and Rehabilitation Plan.

A portion of the site requires clearing to enable extraction operations to progress within several cells. Rehabilitation and maximising the use of the resource will be aided by the following method where clearing is required:

Timber Claiming

The process is described in the attached Closure and Rehabilitation Plan.

All timber that can be used for higher use products (millable timber) shall be selectively removed from the cell area. Timber may be kept on-site for a period of time to cure, meet mill schedules or demand in the market. Logs stored on-site shall be stacked, no closer than 50 metres from the site boundaries, to afford further visual screening and noise attenuation for adjoining residents. All logs shall be milled off-site at Bay Woodworks.

Clearing Vegetation

The process is described in the attached Closure and Rehabilitation Plan and Section 3 of the Social Impact Assessment.

Timber will be recovered and vegetation retained for mulching, direct spreading as a seed source and land stabiliser with the logs providing habitat for fauna.

2.2.2 Topsoil Removal

The process is described in the attached Closure and Rehabilitation Plan and Section 3 of the Social Impact Assessment.

Topsoil will be recovered and retained for use in land closure and revegetation.

2.2.3 Sand Extraction

The process is described in the attached in Section 3 of the Social Impact Assessment.

Extraction shall be carried out utilising the equipment listed in section 2.2.6.

Work on the subsequent cell will commence during extraction of the previous cell to ensure that only one cell at a time would be operating as a working extraction cell, whilst the second cell undergoes preparation works (ie topsoil and organic matter removal) and previous cells are rehabilitated.

Rehabilitation of a cell will commence immediately upon completion of the sand extraction and reinstatement of the topsoil. Haul roads shall also be rehabilitated when the haul road is no longer in use.

2.2.4 Volume of Sand

Test pits dug on-site indicate that approximately 250,000 cubic metres of material but the actual extent of the sand is difficult to estimate.

2.2.5 Pit Form

The pit will be worked in three stages of 2.0 ha, 2.0 ha and 1.0 ha.

Cell closure will be to local native vegetation on batter slopes of around 1 : 4 vertical to horizontal and no steeper than 1 : 1, with a relatively flat excavated floor.

2.2.6 Equipment

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

The equipment used on site will consist on the following:

- Caterpillar 20 Tonne front end loader
- Caterpillar D11 Bulldozer
- Watercart Truck
- 9, 24 and 45 Tonne Haulage trucks

3.0 ENVIRONMENTAL MANAGEMENT RESPONSIBILITIES

3.1 Environmental Management During Operations

3.1.1 Noise and Dust Management

Noise and air emissions are often sensitive matters for certain segments of the community with most concerns principally related to the local amenity impact. The nearest affected receptors in relation to noise and dust emissions are located to the north of the site and are in excess of 500m from the cell work areas. Noise and air quality risks and impacts shall be implemented and monitored with the following measures:

Table 1: Noise and dust management responsibilities

Aspect	Management Measure	Application
Noise	Operations restricted to 7am-6pm Monday to Friday (exclusive of public holidays).	Site Manager
	Vehicle exhausts fitted with mufflers in good working order. Vehicles inspected regularly by pit operator mobile mechanic.	Site Manager Pit Operator Mobile Mechanic
	Vegetation barriers (<i>pinus pinea</i>) and blue gum plantings already established on site boundary.	Site Manager Property Owner
	Noise emissions complaint to <i>Environment Projection (Noise) Regulations 1997</i>	Site Manager
Dust & Air Quality	Dust minimised. Water applied to haulage route as required to minimise any risk of dust impacting adjacent residences/sensitive land uses.	Site Manager
	Long term stockpiles stabilised appropriate to minimise dust (refer Section 2.2.2)	Site Manager
	Vehicle exhausts maintained in good working order with any vehicles visibly smoking not used on site until repaired.	Site Managers Truck Operators Earth Moving Operators
	Vegetation barriers (<i>pinus pinea</i>) and blue gum plantings already established on site boundary.	Site Manager Property Owner

3.1.2 Road Monitoring

The key attribute to the development proposal is the short proximity to major arterial traffic routes (Bussell Highway) and the minor distances to travel to the major nodes of development as identified in the City of Busselton's planning strategies. The haulage route only requires 1km of Chambers and Haag Roads to be traversed from the site to the heavy haulage route of Bussell Highway. If not well managed, road damage from heavy haulage can result in undue pavement wear and resultant issues related to this (ie road safety, road sealing damage, impacts on local municipality budgets).

Evidence of these issues were photographically documented during the supply of sand to the MRWA Vasse-Dunsborough Bypass Project from the adjoining property with truck movements in excess of 280 per day to supply Macca Civil with the sand sub-base for the project (*Busselton Dunsborough Times Friday 22 May 2015*) which utilized the identical haulage route along Chambers Road.

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

To manage the impact of the local road network, the following measures will be implemented and monitored:

Table 2: Transport management responsibilities

Aspect	Management Measure	Application
Road Standard	The crossover from the private haul road to Haag Road has been upgraded at the cost to the property owner.	Property Owner
	Access to the private haul road to be maintained for use by haulage traffic.	Site Manager
	MRWA has confirmed the intersection of Chambers Road and Bussell Hwy is suitable for haulage prior to commencement of activities.	Site Manager
Repair and Maintenance	Where damage to the local roads is solely attributed to haulage from the development, roads shall be repaired	Site Manager
	A road maintenance bond of \$10,000 shall be lodged with the City to ensure damage solely attributable to the development is repaired	Pit Operator

3.1.3 Site Drainage, Water Quality Control

There is no surface water on site. Only one ephemeral waterway, running through the northern boundary of the property and off the site to a neighbouring dam, which is too far away to be impacted.

Control measures include minimising disturbed area (progressive work fronts and rehabilitation), silt entrainment reduction measures (shallow drains of a gentle gradient) and physical silt removal measures (sediment traps, swale drains, silt fences, retarding basins etc.)

All precipitation will be retained in the base of the pit.

To manage water quality, as well as manage chemical and fuels on site, the following measures will be implemented and monitored:

Table 3: Water management responsibilities

Aspect	Management Measure	Application
Drainage and Sediment Control		Site Manager
	Stockpiles will not have batters steeper than 1:1.	Site Manager Earthmoving operators
	Progressive rehabilitation will be undertaken to minimise the surface area disturbed soil.	Site Manager Earthmoving operators
Protection of the Water Table	The final surface will be maintained at > 0.5 metres to the highest known water table.	Site Manager
Closure	A Closure and Rehabilitation Plan has been prepared and approved by DWER as part of Clearing Permit CPS 8863. This includes closure of	Site Manager Land Owner

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

	the site, final land surface, allocation of Conservation Covenants and improvements to and management of flora and vegetation.	
HAZCHEM Management	All fixed fuel tanks and chemical stores (if any) will be bunded to provide a secondary leak barrier. Bunds will be routinely monitored for signs of leaks	Site Manager
	Spills will be minimised through the use of bunds and drips trays.	All personnel
	Where spills do occur, suitable spill cleanup equipment (spill kits or similar) will used to capture all split material and dispose of this appropriately.	All personnel

3.1.4 Quarantine – Dieback and Weeds

Phytophthora (or dieback) has the potential to devastate tracts of native vegetation as is evident from the damage caused to the vegetation on the site.

Care must be taken during operations to ensure that the pathogen is not spread to high quality native vegetation. As well as pathogens, if not carefully managed, vehicles and equipment can also harbour weeds onto the property or transferring them from the property, generally by seed.

To manage quarantine issues, the following measures will be implemented and monitored:

Table 4: Dieback and weed management responsibilities

Aspect	Management Measure	Application
Phytophthora	All earth moving equipment will be thoroughly cleaned using water and phytocide rinse prior to leaving site. In dry conditions, brushing may be used in preference to washing in accordance with DWER guidance.	Site Manager Earthmoving operators
	Topsoil shall be stripped and stockpiled separately outside the extraction area.	Site manager
	Haul trucks shall be kept to haul roads as far as practicable and as a preference will come into contact with subsoil/ sand only.	Site manager Truck Operators
	Recipients of fill will be notified that <i>Phytophthora</i> may be present in fill material and that the material should not be used near sensitive native vegetation.	Site manager Truck operators
	Vehicle and pedestrian traffics will be prohibited from accessing the southern conversation block without approval from the Site Manager and wheels and/ or boots will be washed prior to entry if approval is granted.	All personnel
Weeds	All excavators coming to or from the site will be washed thoroughly at their point of origin prior to ravel to limit the potential for spreading weeds.	Site manager Earthmoving operators
	Vehicle and pedestrian traffics will be prohibited	

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

	from accessing the southern conversation block without approval from the Site Manager and wheels and/ or boots will be washed prior to entry if approval is granted.	
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3.1.5 Flora and Fauna, Site Buffering and Rehabilitation

The project is aiming for a net increase in the quality of vegetation, the protection of that vegetation and hence the availability of high-quality habitat within the Shire. To protect flora and fauna, protect and enhance existing site buffering and ensure rehabilitation of the site successful, the following measures will be implemented and monitored:

Table 5: Flora and vegetation management responsibilities

Aspect	Management Measure	Application
Flora and Fauna	No-go areas will be flagged using clearly visible tape prior to works	Site Manager
	There will be no trenches or pits opened that do not have provision for animals escape.	Site Manager Earthmoving Operators
	The southern portion of the site will be protected via a native vegetation covenant, or a revegetated wildlife corridor will be established on site as documented in Section 2.2.5	Site Manager
	A Closure and Rehabilitation Plan has been prepared and approved by DWER as part of Clearing Permit CPS 8863. This includes the protection and management of flora and vegetation on Lot 75.	Site Manager Landholder
Site Buffering	Site buffering will planted and maintained in accordance with the Landscape/ Visual Screening Plan (Attachment 2).	Site Manager
Rehabilitation	Topsoil shall be stripped and stockpiled separately for re-use during rehabilitation.	Site Manager
	The site shall be progressively rehabilitated. Rehabilitation works shall be practically complete prior to extraction works progressing to the cell two forward in the sequence.	Site Manager
	Work areas will be re-topsoiled and rehabilitated to pasture (see relevant section of this OEMP)	Site Manager Earthmoving Operators
	Hollow logs and other remnant material shall be utilised in replanted patches of trees to enhance early habitat quality	Site Manager
	A Closure and Rehabilitation Plan has been prepared and approved by DWER as part of Clearing Permit CPS 8863. This includes closure of the site, final land surface, allocation of Conservation Covenants and improvements to and management of flora and vegetation.	Site Manager Land Owner

4.0 IMPLEMENTATION

This section details how the management measures detailed in the OEMP are implemented.

4.1 Organisational Structure, Roles and Responsibilities

Responsibilities covered by this OEMP are assigned to individuals or in some cases groups of personnel to ensure that each action has an accountable party. Table 4.1 lists the general duties personnel have under this OEMP. Section 3 details specific roles and responsibilities of personnel relating to the sound environmental management of the operation.

Table 6: On site roles and responsibilities

Roles	Responsibilities under the OEMP
Site Manager	Implementation of the OEMP and all the management measure therein Compliance reporting to the City and other statutory authorities Monitoring and documentation All liaison with regulatory agencies
Earthmoving Operators	Adherence to all applicable on-site management measures
General Employees	Adherence to all relevant onsite management requirements
Truck Operators	Adherence to the school bus restrictions and site operating hours Adherence to all relevant onsite management measures
Subcontractors and Service Providers	Adherence to applicable on-site management measures

The City contact officer will be formally advised of the contact details of the Site Manager prior to works commencing and prior to any change of this key site contact. All correspondence in relation to the development should be directed to this contact. At the discretion of the property owner, the contact person may be either the property owner or a contractor representing the property owner.

4.2 Contractual Controls

In addition to this OEMP, several contractual arrangements are in place to ensure that the environmental controls specified for this development are followed. These are listed in Table 4.2.

Table 7: Contractual arrangements

Title	Contractual Matters	Contract Parties
Performance Bonds	Cover road repair and road maintenance	City and Pit Operator
Sand Extraction Licence	Covers the City's requirements for accepting responsibility for implementing the conditions of Development Approval	Property Owner and Pit Operator

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

4.3 Environmental Monitoring and Incident Records

Routine monitoring is an integral part of sound environmental management, so that issues can be identified early and management steps put in place to be minimise any environmental impacts arising. Routine and non-routine monitoring will be undertaken in accordance with Table 4.3

Table 8: Monitoring requirements

Regularity	Monitoring Undertaken
Weekly	Truck movements
Bi-annually	Compliance Review by a suitably qualified surveyor, detailing: <ul style="list-style-type: none"> - The extent of extraction that has occurred in cubic metres - Expected completion of extraction (250,000m³) at current extraction rate - Extent of rehabilitation undertaken in accordance with planning permission
As Required	Records of complaints Records of incidents where a breach of the OEMP has occurred

4.4 Reports

Routine and non-routine reports will be provided to the City in accordance with Table 4.4

Table 9: Reporting requirements

Report	When/ Who	Timeframe for Submission
Bi- annual Compliance Review	Six monthly from the date of the permit commence extraction, by a suitably qualified surveyor	Within 1 month after each six month period
Complaints and incidents reporting	After incident or complaint, by the Site Manager	Verbal notification within the next business day. Hard copy within 5 business days.

4.5 Documentation

The following documentation and records will be maintained:

- daily quantity of sand extracted (estimated)
- daily truck movements
- incident reports
- environmental monitoring records
- complaints or infringement notices (if any)
- material Safety Data Sheets (as required)

4.6 Management of Complaints

Any query or complaint shall be courteously received, thoroughly investigated by the Pit Operator and closed out a response provided to the complainant. A copy of any complaint will be forwarded through to the City contact officer for information. Recorded information that shall include:

- date and time of call/query;
- name of the person receiving the call/information;

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

- name and contact details of the caller/ informant (if provided);
- details of the query or complaint;
- action to follow-up on the complaint; and,
- response provided to the caller.

It is expected that the City's Compliance Officer, upon receiving a similar query, would forward similar details of the query to the Site Manager to follow-up.

4.7 Training

All personnel working on the project will be provided with a level of training relevant to their site duties, including:

- all full time site personnel will be comprehensively taken through the OEMP and requirements within it.
- all truck operators will be advised of the haulage-specific period requirements and the requirements relating to school bus hours.
- all service providers and sub-contractors involved in the specific elements of the work will be advised of specific elements of the OEMP relevant to their scope. This will be determined by the City Officer (or delegate) on a case by case basis and may take the form of a visitor induction or Job Safety and Environmental Assessment 'JSEA' prior to their scope of work commencing.

4.8 Review

The OEMP will be periodically reviewed to ensure that it accurately reflects site controls, and captures project approval conditions. It will be reviewed by the Site Management in consultation with the City and, if amended, will be submitted for re-approval. The OEMP in force for the activity shall be used until approved by the City.

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

5.0 COMMITMENTS REGISTER

Table 10 captures the main commitments made in the description of the project and the social impact assessment, to ensure the commitments are carried through into operations. These commitments are generally in addition to any legislative requirements.

Table 10: Commitments register

Aspect	Commitment
General Management	The relevant sections of the DEP <i>Code of Practice for Extractive Industries (1990)</i> and DME <i>Environmental Management of Quarries</i> guidelines will be implemented
	An Environmental Management Plan for the site will be approved by Shire prior to operations commencing, in consultation with CALM.
Flora and Fauna	Native vegetation to be kept will be fenced or otherwise clearly indicated as no-clear zones.
	Extraction will be staged 2ha at a time and progressive rehabilitation will be undertaken.
Air Quality	Dust will be minimised. Water will be applied to haul roads if required to minimise any risk of dust impacting on adjacent residences or sensitive land uses.
	Long term stockpiles will established as appropriate to minimise dust
	Vehicle exhausts will be kept in good working order. Excessively noisy vehicles will be kept in good working order. Vehicles visibly smoking (after a suitable start-up period) will not be used on site until repaired)
Buffers	The following minimum buffer distances are to maintained: 500m to residence 100m to watercourse 100m to public road
Noise	Operations restricted to 7am-6pm Monday to Friday (excluding public holidays) or daylight hours if these are more restrictive (eg during winter)
	Vehicles will have mufflers fitted and in good working order. Excessively noisy vehicles will be inspected and mufflers repaired.
Surface and Ground Water	Spills will be minimised through the use of bunds and drip trays. Vehicle maintenance will be generally restricted to the pit operator's workshop.
	Where spills occur, spill cleanup equipment (spill kits or similar) will be used to capture all spill material. Contaminated soil shall be moved off-site to an appropriate facility.
	All fixed fuel tanks and chemical stores (if any) shall be fully bunded to provide a secondary leak barrier. Bunds shall be routinely monitored for signs of leaks.
	Stockpiles shall not have batters greater than 1:1.
	Progressive rehabilitation of project cells.
Quarantine	Sediment controls shall be implemented on appropriate drainage lines, including the use of silt-stop fencing or straw bales as appropriate. Drains shall be designed to minimise water run-off velocities. Sediment traps shall be routinely monitored and cleared out as appropriate.
	The Dieback Management Plan shall be implemented, including: <ul style="list-style-type: none"> vehicle wash own procedures and equipment

Operations Environmental Management Plan - Sand Extraction
Lot 75 Haag Road, Yelverton – **Version 2**

	<ul style="list-style-type: none"> notification to recipients of fill that phytophthora may be present an traffic to sensitive site areas, except where strict quarantine measures have been adhered to. <p>The Dieback Management Plan is developed with Department of DPaW and the City.</p>
Safety and Transport	<p>An internal haul road shall follow the east boundary of Lot 75 Haag Road, Yelverton and access Haag Road at the north-east corner of the site, approximately 1100 metres from Chambers Road intersection.</p> <p>Any damage to Chambers Road solely attributed to the project shall be repaired promptly.</p>
Queries and Complaints Handling	<p>A queries/complaints register shall be maintained and handled in accord with OEMP with an emphasis on resolving the issue raised and responding to the person who raised the issue promptly.</p>
Rehabilitation	<p>Topsoil will be stockpiled separately for use in rehabilitation.</p> <p>A portion of any native vegetation cleared will be mulched for utilisation in rehabilitation. Old 'habitat' logs shall be kept for use in rehabilitation in accord with the rehabilitation plan.</p> <p>Implementation of the selected rehabilitation plan.</p> <p>Rehabilitation to include dieback hardy species, preferably species that enhance habitat for selected species.</p>
Resource maximisation	<p>When clearing occurs, every effort will be made to maximise resource recovery (eg milling timber) in preference to burning.</p>
Visual Amenity	<p>Tree logs (if any) shall be used as appropriate to avoid further screening of the extraction operations.</p>

DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
INITIAL ROUND - Responses from 6 October – 21 October 2020

Ref No.	Locality	Mode of submission & Yoursay reference number (if applicable)	Do you support the proposal?	Comments	Officer Response
1	Vasse	Yoursay Response No 1	No	<ul style="list-style-type: none"> Trucks not to use unsealed portion of Chambers Road due to concerns regarding dust and wildlife crossing the road. Concerns regarding turning movement for trucks travelling north along Bussell Highway and concealment of turn off. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route.
2	Carbunup	Yoursay Response No 2	No	<ul style="list-style-type: none"> Concerns regarding speed of trucks using Chambers Road. Concerns regarding trucks crossing bridge along Chambers Road. Concerns regarding dust along Haag Road. Recommends that Haag Road should be sealed. Concerns regarding noise from trucks travelling along Chambers Road. Concerns regarding clearing of bushland on the property. Concerns regarding weeds. Recommend planting of buffer trees long the boundaries to assist with screening and wind breaks. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route. Amenity impacts, including setbacks to sensitive premises. Environmental Impacts. Phytophthora dieback (dieback) & weed management.
3	Carbunup	Yoursay Response No 3	No	<ul style="list-style-type: none"> Concerns regarding damage to Haag Road as a result of heavy haulage (which is unsealed) and provides the only access to several residences and a commercial tourist location. Concerns regarding noise from road traffic and heavy machinery used for site works with noise associated from previous sand mining activity on the site audible from residences. Whilst the noise may be within prescribed limits it nonetheless impacts on the otherwise serenity of the rural environment. Concerns regarding operating days which application indicating 6 days a week (Monday – Saturday). Concerns regarding impact of surrounding property within the National Trust. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route. Amenity impacts, including setbacks to sensitive premises. Phytophthora dieback (dieback) & weed management. Environmental impacts. <p>Operating hours are consistent with the City's LPP2.3.</p>

**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
INITIAL ROUND - Responses from 6 October – 21 October 2020**

				<ul style="list-style-type: none"> • Since the cessation of previous sand mining activity at the applicants property there has been a notable increase in the number and frequency of both Red tailed and White tailed Cockatoos visiting and roosting within the confines of property. • Concerns regarding transmission of dieback from the site. • Concerns regarding dust control/mitigation along haulage of Haag Road. • Concerns regarding removal of vegetation on the site and impact on fauna using bush corridors within the area. 	
Cl	Carbunup River	Yoursay Response No 4	No	<ul style="list-style-type: none"> • Haag Road is unsuitable for the volume and type of traffic stated in this DA. • Safety concerns regarding truck movements along Haag Road. • Truck movements from previous extractive approved on the site resulted in significant damage, including corrugations, ruts and potholes along Haag Road • Issues regarding dust during previous operation of extractive on the site from truck movements along Haag Road. • Noise from road traffic and site works. • Concerns regarding effect on native vegetation on adjoining properties that is protected under National Trust Covenants as well as fauna that pass through the area between areas of bushland. • Concerns regarding dieback spreading from the site. • Concerns regarding removal of vegetation on the site and nesting habitat for endangered fauna. • Negative impact upon amenity and lifestyle. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> • Haulage, including dust from use of gravel road and suitability of haulage route. • Amenity impacts, including setbacks to sensitive premises. • Phytophthora dieback (dieback) & weed management. • Environmental impacts, including clearing permit.
5	Yelverton	Yoursay Response No 5	No	<ul style="list-style-type: none"> • Run existing tourism accommodation business in the locality. • Concerns regarding noise and impact upon the amenity of the area. • Concerns regarding dust. • Concerns regarding trucks travelling to/from the site coming. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> • Amenity impacts, including impact on surrounding properties and noise. • Haulage, including dust from use of gravel road and suitability of haulage route.

**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
INITIAL ROUND - Responses from 6 October – 21 October 2020**

6	Carbunup River	Yoursay Response No 6	No	<ul style="list-style-type: none"> Concerns regarding Haag Road not being suitable for heavy vehicles and large volumes of traffic. Property is currently for sale and concerns regarding guarantees about re-vegetation. Existing revegetation undertaken on the site not suitable. Concerns regarding vibration. Concerns regarding the use of reversing beepers. Concerns regarding lack of wash down station on site and commentary regarding planning Phytophthora resistant plants. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route. Environmental impacts, including clearing permit. Amenity impacts, including setbacks to sensitive premises. Phytophthora dieback (dieback) & weed management.
7	Yelverton	Yoursay Response No 7 & 8	No	<ul style="list-style-type: none"> No active sand mines in the vicinity. Concerns regarding application being within 500m of a residence and would result in significant negative and detrimental impact to quality of life. The extraction project would significantly impact tourism accommodation within 1km of the proposed operation including concerns regarding noise from heavy machinery in constant operation. Significant risk of environmental contamination to our property via water run off containing Phytophthora Cinnamomi (dieback). Significant risk of environmental contamination by transporting Phytophthora Cinnamomi infested sand to other locations. Concerns regarding health implications of Crystalline Silica dust. The proposal would result in the clearing of 140,000m² of bush. Proponent cannot be trusted to adhere to requirements. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including setbacks to sensitive premises. Phytophthora dieback (dieback) & weed management. Environmental impacts, including clearing permit.
8	Yelverton	Yoursay Response No 9	No	<ul style="list-style-type: none"> Concerns regarding health implications of Crystalline Silica dust. Concerns regarding residences within 500m of the extraction. Concerns regarding dust from operation and stock piles. Concerns regarding impact on natural environment and clearing of 140,000m² of forest and bush. Concerns regarding loss of habitat for endangered species. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including setbacks to sensitive premises. Environmental impacts, including clearing permit. Haulage, including dust from use of gravel road and suitability of haulage route.

**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
INITIAL ROUND - Responses from 6 October – 21 October 2020**

				<ul style="list-style-type: none"> Concerns regarding noise from trucks and machinery, including beeping noise, horns honking and the engine noise from extraction machinery. Concerns regarding impact on surrounding tourism accommodation business. 	
9	Carbunup River	Yoursay Response No 10	No	<ul style="list-style-type: none"> Concerns regarding tourism accommodation businesses within the locality. Concerns regarding vehicle access points. Concerns regarding noise. Concerns regarding dust including issues from previous operations on the site as well as haulage along Haag Road. Concerns regarding compliance with operating hours. Concerns regarding proposed rehabilitation and that previous rehabilitation that was suppose to be undertaken on the site has not been completed. Concerns regarding transportation of Phytosphthora Cinnamomi (Dieback) and potential contamination of surrounding sites including avocado plantation. Concerns regarding use of Chambers Road for haulage. Concerns regarding separation distances to sensitive land uses. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including setbacks to sensitive premises. Environmental impacts, including clearing permit. Dieback management. Haulage and vehicle movements.
10	Vasse	Yoursay Response No 11	No	<ul style="list-style-type: none"> Concerns regarding noise. Concerns regarding dust. Concerns regarding environment. Concerns regarding non-compliance with State Planning policy "Leeuwin-Naturalististe Ridge Policy" with area shown as being of "Natural Landscape Significance" on Lot 75. Concerns regarding significant dieback on the site. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including noise and dust. Environmental impacts, including clearing permit. Phytosphthora dieback (dieback) & weed management. Compliance with Leeuwin-Naturaliste Ridge Statement of Planning Policy

DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
INITIAL ROUND - Responses from 6 October – 21 October 2020

Agency Submissions

Ref No.	Agency	Comments	Officer Response
1	Department of Water and Environmental Regulation	<p>The history of the proposal is noted, principally communications regarding the potential for sand extraction to impact on environment and water resource values. Key issues and recommendations are provided below, and these matters should be addressed.</p> <p>1. Issue: Clearing of Native Vegetation Advice: the proposal to extract sand from Lot 75 Haag Road remains subject to a decision being made by the Department to grant or refuse a clearing permit, in accordance with the clearing provisions of the 'Environmental Protection Act 1986' (EP Act).</p> <p>Discussion: The Department has been communicating with the clearing permit applicant and the City of Busselton, regarding the application to clear native vegetation. Whereas the Department aims to minimise and mitigate the impacts of any clearing, if significant residual impacts remain, counterbalancing measures need to be considered, such as revegetation, rehabilitation, ceding land into conservation estate, additional land acquisition and/or monetary contribution to the offset fund. The Department is currently waiting on the applicant to provide a response to potential options for offsetting impacts of projected clearing. Until the response is received a decision to grant or refuse a clearing permit cannot be made.</p> <p>2. Issue: Protection of Groundwater Resources Advice: if a clearing permit is granted (refer to #1 above), any extractive industry licence issued by the City of Busselton should be subject to conditions that protect groundwater resources. This would include the standard City of Busselton condition: "The lowest level of excavation shall always be a minimum of at least (insert) 0.5 metres above the maximum seasonal groundwater level and no dewatering works are to be</p>	<p>Confirmation has been received from DWER (Native Vegetation Regulation branch), that subject to a development application being approved, a clearing permit subject to conditions will be issued.</p> <p>Groundwater advice noted and conditions reflect advice from DWER.</p>

**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
INITIAL ROUND - Responses from 6 October – 21 October 2020**

		<p>undertaken. The City is to be notified within 24 hours if the water table is intercepted”.</p> <p>Discussion: the proponent has provided a professional hydrogeological assessment report: ‘Hydrogeological Assessment for S & C Threadgold 157 Haag Road, Yelverton Lot 75 on Diagram 98087, Water Direct Pty Ltd, August 2020 v.2’ (the Report). The Department has reviewed the Report including Figure 4, which illustrates contours for interpreted maximum seasonal groundwater levels (MSGSL). The department accepts these MSGSLs as being indicative of local conditions. Any extractive industry licence issued by the City of Busselton should be conditioned that sand may only be removed to a level 0.5m above the interpreted MSGSL. It is understood that the proposed pit is divided into six stages. The City may wish to consider a licence condition whereby it requires pit floor levels in a plan for each stage of the operation, as a measure that will guide on ground works.</p> <p>Please note that should the City of Busselton make a request, the Department is in a position to review any (Draft) Extractive Industry Licence conditions that relate to matters of environment and/or water management,.</p> <p>Finally, in the event there are modifications to the proposal that may have implications on aspects of environment and/or water management, the Department should be notified to enable the implications to be assessed.</p>	
2	<p>Department of Biodiversity, Conservation and Attractions (DBCA)</p>	<p>Clearing Permit</p> <p>The Proposed Sand Extraction Closure and Rehabilitation Plan (Landform Research, 8 September 2020) (Rehabilitation Plan) refers to an application for a Department of Water and Environmental Regulation (DWER) clearing permit.</p> <p>DBCA expects that the environmental values that are likely to be impacted by the proposed gravel extraction will be considered through the assessment of the clearing permit, through which DBCA may provide advice to DWER. DBCA suggests that if</p>	<p>See comments above regarding clearing permit.</p>

**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
INITIAL ROUND - Responses from 6 October – 21 October 2020**

		<p>development approval is provided then the approval should be subject to a clearing permit being issued.</p> <p>DBCA notes that the Rehabilitation Plan refers to a conservation covenant as part of a DWER clearing permit offset proposal. If the offset proposal is deemed suitable by DWER, then DBCA recommends that no extraction works are undertaken within the proposed conservation covenant area, until the covenant has been finalized. This includes firebreak clearing or gravel pit rehabilitation, to ensure any works do not reduce the biodiversity values of the site and meet the covenant agency guidelines.</p>	
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DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022

Ref No.	Locality	Mode of submission & Yoursay reference number	Do you support the proposal?	Comments	Officer Response
1	Yelverton	Yoursay Response No 1 & 2	No	<ul style="list-style-type: none"> Concerns regarding proximity of extraction area and impacts on quality of life and enjoyment. Issues with previous extractive operating on the site and issues with noise and dust. Concerns regarding impact of the proposed extraction on short term accommodation business which adjoins the Site. Significant risk of environmental contamination to neighbouring property via water run off containing Phytosphthora Cinnamomi (dieback) from a stream in close proximity to the extractive. Significant risk of environmental contamination by transporting dieback infested sand to other locations. Significant risk to neighbours of exceeding safe exposure levels to Crystalline Silica dust. Destruction of approx. 70,000 m² of native vegetation. The proponent has sold and no longer lives on the property. The previous sand extraction on the property has not been rehabilitated. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including setbacks to sensitive premises. Phytosphthora dieback (dieback) & weed management. Environmental Impacts. <p>It is noted that through the time taken to process the development application the property has sold, however, the new owner has signed the application form and the previous owner has remained the applicant. As development approval runs with the land and not a particular owner this does not alter the development application in any way.</p>
2	Yelverton	Yoursay Response No 3	No	<ul style="list-style-type: none"> Plan to construct a dwelling in the near future within 400m of the proposed extraction site. Concerns regarding validity of hydrological assessment. Concerns regarding validity of fauna assessment Concerns regarding failure of previous revegetation activities. 	<p>No current development approvals or building permits for dwellings on submitter's property.</p> <p>Hydrological assessment has been referred to DWER who were comfortable with the information provided. Through a condition of development approval the extraction must maintain a minimum separation of 500mm from the maximum seasonal ground water table during operations and 700mm post rehabilitation.</p> <p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Environmental Impacts.

DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022

Ref No.	Locality	Mode of submission & Yoursay reference number	Do you support the proposal?	Comments	Officer Response
3	Yelverton	Yoursay Response No 4	No	<ul style="list-style-type: none"> Lived in close proximity for more than 15 years and have issues with noise from machinery operating. Concerns regarding operating hours. Concerns regarding trucks using Chambers road and safety concerns. Concerns regarding intersection of Chambers Road and Bussell Highway. Concerns regarding lack of rehabilitation undertaken as required for previous extractives approved on the site. Location is within a designated City of Busselton Fauna and Flora precinct as sign posted at the beginning and end of Yelverton Road and the beautiful Wildwood Road. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including setbacks to sensitive premises. Phytophthora dieback (dieback) & weed management. Environmental Impacts.
4	Dunsborough	Yoursay Response No 5	No	<ul style="list-style-type: none"> Concerns regarding maintenance of Haag Road which is currently in poor condition and very dangerous. Concerns regarding the destruction environmentally is still visible from the last extraction. Concerns regarding run off from the site in winter into surrounding swamps, creeks and dams. The site is located within a bio diversity hot spot and the environment and the health of the residents that have lived there the majority of there lives have to pay the price for this Previous operations have not complied with restrictions placed on them, including operating times, and has not been rehabilitated with native vegetation after ceasing extraction and the mine wasn't monitored enough to make sure they were following the rules. Just the noise of rumbling trucks 12 hours a day affects 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route. Environmental Impacts. <p>All emissions, including stormwater run-off, required to be contained on site and cannot enter into surrounding swamps, creeks and dams in accordance with the applicable environmental legislation.</p> <p>Compliance of previous operations can not be taken into considered as part of the assessment of this proposal. The application is required to be assessed on its individual merits against the applicable planning framework.</p>
5	Carbunup River	Yoursay Response No 6	No	<ul style="list-style-type: none"> Applicant is no longer the owner of the property. It is unclear who will be liable for the activities or commitments, particularly as rehabilitation extends for a minimum of 5 years. Multiple commitments are made regarding activity management however the commitments are not 	<p>Refer to Officer Response to submitter 1 regarding change of ownership.</p>

DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022

Ref No.	Locality	Mode of submission & Yoursay reference number	Do you support the proposal?	Comments	Officer Response
				summarised in one place where they can be easily identified which makes them less likely to be carried out. The lack of clarity in the documentation provides little confidence that the activity will be executed in an environmentally responsible manner and per the 'notional' measures that have been implied.	
6	Carbunup River	Yoursay Response No 7 & 11	No	<p>First submission</p> <ul style="list-style-type: none"> Concerns regarding distance from extractive business to residents / business. Concerns regarding trucks travelling along Haag Road and impacts of dust on surrounding properties. Potential to impact to tourism and accommodation. Operator has previously not complied with conditions of development approval on previous extractive approvals, including operating hours, not maintaining Haag Road, not using wash down station correctly, trucks not stopping at entrance to site, loads not covered when leaving site and no rehabilitation done. Significant risk of exposure via transportation of infested sand. Over the last 12 we have outlaid significant capital funds to expand operations into horticulture including avocados. dieback is the single biggest threat to avocado orchards. <p>Second Submission</p> <ul style="list-style-type: none"> Concerns that limiting the approval timeframe may increase the amount of truck movements from the site. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including setbacks to sensitive premises. Phytophthora dieback (dieback) & weed management. <p>Refer to Officer Response to submitter 1 regarding change of ownership.</p>
7	Carbunup River	Yoursay Response No 8	No	Accommodation business is within restriction zones and only access road to accommodation will be severely affected by truck movements.	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> Amenity impacts, including setbacks to sensitive premises.
8	Carbunup River	Yoursay Response No 9	No	<ul style="list-style-type: none"> Owner has relocated overseas - how will they be held to account for any of the conditions that have been set. 	Refer to Officer Response to submitter 1 regarding change of ownership.

DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022

Ref No.	Locality	Mode of submission & Yoursay reference number	Do you support the proposal?	Comments	Officer Response
				<ul style="list-style-type: none"> Operator has not completed previous rehabilitation as required under previous approvals. Preference given for a shorter approval time frame with material removed quickly rather than 5 year time frame and removal of material spread over this time. 	Approval timeframe of 5 years is consistent with the City's LPP2.3.
9	Carbunup River	Yoursay Response No 12	No	Response unable to be downloaded – request was sent to submitter to resend.	Noted.
10	Carbunup River	Yoursay Response No 13	No	<ul style="list-style-type: none"> Haag Road is unsuitable to be used a haulage route Significant increase in dust. Significant damage to Haag Road as the proposed haulage route. Noise from road traffic and site works. Effect on our property as custodians of National Trust Covenanted Bushland/Dieback risk. Decimation of natural bushland on the proposed site. Effect on our amenity and lifestyle. 	Refer to Council report for further discussion regarding – <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route. Amenity impacts, including setbacks to sensitive premises. Phytophthora dieback (dieback) & weed management.
11	Carbunup River	Email submission	No	<ul style="list-style-type: none"> House is within 60 – 70 metres of Chambers Road which forms part of the Haulage Route Concerns regarding safety of trucks travelling along Chambers Road and issues with trucks associated with previous operations Concerns regarding the clearing of native vegetation and no buffer planting proposed Concerns regarding dust management along Haag Road 	Refer to Council report for further discussion regarding – <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route. Amenity impacts, including setbacks to sensitive premises. Environmental Impacts.
12	Carbunup River	Email Submission	No	<ul style="list-style-type: none"> Safety concerns regarding trucks using Chambers Road. Concerns regarding removal of native vegetation on the site. Concerns regarding dust contamination from trucks travelling along Haag Road. Concerns regarding previous operations on the site. 	Refer to Council report for further discussion regarding – <ul style="list-style-type: none"> Haulage, including dust from use of gravel road and suitability of haulage route. Environmental Impacts. Refer to Officer Response to submitter 4 regarding compliance of previous operations.

DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022

Ref No.	Locality	Mode of submission & Yoursay reference number	Do you support the proposal?	Comments	Officer Response
13	Yelverton	Email Submission	No	<ul style="list-style-type: none"> - Concerns regarding dust and noise monitoring and ensuring compliance. - Material has already been extracted from the area designated as the exclusion zone as part of this application. 	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> • Amenity impacts, including setbacks to sensitive premises. <p>Refer to Officer Response to submitter 4 regarding compliance of previous operations.</p>

Agency Submissions

	Agency	Comments	Officer's Response
1	National Trust of Western Australia	<p>The National Trust of Western Australia (National Trust) has become aware of a development proposal for 157 Haag Road, Yelverton which has the potential to negatively affect the natural values on a National Trust conservation covenant, located less than 800m north of the proposed development. While the development submission addresses the processes on its own property the National Trust does not believe it fully demonstrates an understanding of the impact on surrounding properties - particularly those to the north.</p> <p>The National Trust natural heritage conservation covenant program has a commitment to ensuring the enduring protection of native bushland that exists on private property across the State of Western Australia. Part of our role is one of advocacy. It is in this capacity that we submit a response to the survey available on the City of Busselton's website.</p> <p>On reviewing the updated documentation accompanying the advertised submission, the National Trust is primarily concerned about the following impacts to the property/s north of Haag Road:</p>	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> • Haulage, including dust from use of gravel road and suitability of haulage route. • Phytophthora dieback (dieback) & weed management. <p>Hydrological assessment has been referred to DWER who were comfortable with the information provided. Through a condition of development approval the extraction must maintain a minimum separation of 500mm from the maximum seasonal ground water table during operations and 700mm post rehabilitation.</p>

**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022**

		<ul style="list-style-type: none"> • Dust generated from trucks using the unsealed, clay based Haag Rd; • Water table changes; • Casual sanitary procedures for Dieback and dust mitigation; and • Loss of habitat for local native species. <p>The owner reported that the previous 6-8month long sand extraction industry (competed approx. 2018), occurring directly south of their property created significant amount of smothering of vegetation by dust. This was primarily generated by the movement of trucks to and from along Haag road - generated from the clay road base materials used when Haag road was 'upgraded'.</p> <p>Several areas of Banksia trees and other shrubs appeared to be adversely affected. Several of the trees have since died. The other vegetation has only slowly rejuvenated.</p> <p>Fine particulate dust creates significant ecological and human problems:</p> <ul style="list-style-type: none"> • The effects of dust falling onto plants may physically smother the leaves and this will affect photosynthesis, respiration, and transpiration. Dust can also physically block stomata and the plant can suffocate; • Visible injury symptoms may occur and generally there is decreased productivity. This will often be seen as death and/or loss of foliage. As such ecological community structure is sometimes altered; • The flow on from this is the diminution of resources available to the fauna of the area and potential loss of birds and reptiles and bats; • Soil ph is affected - particularly if the road base is crushed limestone. The resultant acidification of the soil even if slight, has a deleterious effect on already depauperate soils; and • Human health. While the National Trust understands that significant work has been undertaken to mitigate detrimental environmental impacts we are concerned 	
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**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022**

		<p>about the human health effects of extremely fine particles that are blown towards the people living north of Haag Road. These smaller particles tend to remain suspended in the air for longer periods and can penetrate into the lungs.</p> <p>Water table changes. The submission report identifies the aquifer/s under the proposal area with assurances that the depth of extraction will not interfere with water tables. In the revised submission plan the total area of extraction is reduced from approx. 11 ha to 5ha. The amount of sand to be extracted does not appear to be reduced. Does this mean that the pit will be deeper than the original estimation? Piercing the water table has some severe consequences with the already-sensitive hydrology of the Swan Coastal Plain.</p> <p>The scale of the sand mining operation proposal is large - 20 trucks a day for 5 days a week for 5 years. It is of significant concern that the trucks are correctly sanitized against the spread of Phytophthora/Dieback. Washing trucks down will also reduce the dust generated by the vehicles. What checks and monitoring will occur with maintain high hygiene standards for the duration of the proposal. Evidence from the previous project does not engender confidence that these essential actions will occur consistently.</p> <p>The National Trust conservation covenant contains confirmed foraging habitat for the endangered Baudin's Carnaby's and red-tailed black cockatoo species. Tree hollows exist in trees, some over 500 years old, on the northern adjacent properties. Survey of the covenanted bushland noted onground evidence indicating the presence of possums, Quenda, wallaby and kangaroo. The ongoing drift of suffocating, acidic dust over the neighboring vegetation may eventually cause deterioration in the present day healthy habitat/s.</p> <p>The National Trust therefore does not support this proposed development in its current form.</p>	
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**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022**

		<p>Suggested amendments could include:</p> <ul style="list-style-type: none"> • Sealing Haag and Chambers Road to mitigate dust generation to northern neighbours; • Review depth of extraction pits/implications of reduced footprint and quantity of sand removed; • Sanitation procedures compulsory; and • Introduction of monitoring sites on the north side of Haag Road. 	
2	DBCA	<p>The area identified within the extractive industry application contains the Mattiske and Havel 1998 Yelverton (Yd) vegetation complex that is under-represented within the conservation estate. The Yd complex is also of limited occurrence with less than 1500 hectares remaining and would be worthy of protection in the landscape.</p> <p>Lot 75 is also within an identified Threatened and Priority Ecological Community (Banksia woodlands of the Swan Coastal Plain) and is also considered likely to contain a priority listed species <i>Cyathochaeta teretifolia</i> (Priority 3).</p> <p>The information submitted with this application is dated 2/10/2013 and should be supplemented with recent flora, fauna and vegetation surveys to facilitate an informed assessment of this application. It is therefore recommended that a more recent Vegetation, Flora and Fauna survey be undertaken by a suitably qualified and experienced environmental consultant, and this be submitted to DBCA as well as Department of Water and Environmental Regulation (DWER) for further assessment.</p> <p>The vegetation on Lot 75 contains suitable habitat for the critically endangered western ringtail possum, endangered white tail black cockatoo and vulnerable forest red tail black cockatoo.</p> <p>DBCA notes that this application has been referred to DWER. DBCA expects that the environmental values that are likely to be impacted upon by the proposed extraction will be adequately considered through the assessment of the clearing permit, through which DBCA can provide comment to DWER. DBCA</p>	<p>Refer to Council report for further discussion regarding –</p> <ul style="list-style-type: none"> • Environmental Impacts. <p>Applicant has submitted a dieback management plan and, while the status of the property is unconfirmed, it is recommended that a precautionary approach be taken and operations be required to comply with via a condition of development approval.</p>

**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022**

		<p>suggests that if development approval be provided then the approval be subject to a clearing permit being issued by DWER.</p> <p>Additional comments provided in relation to dieback status of property -</p> <p>I have checked the file and in 2005 (7th March), Glevan Consulting undertook dieback testing on this lot within the Yelverton Yd which produced a "positive" result for <i>Phytophthora cinnamomi</i>.</p> <p>Where positive results are found within native vegetation, it would not be recommended for earthworks or extraction to occur. The extracted materials are likely to spread dieback to other sites where the materials are used.</p> <p>The report is attached. This report appears to have cut/paste sections and would not be up to date or relevant in 2022. E.g. Yelverton Yd vegetation complex is now well under the 30% commonwealth figures for retention.</p> <p>A DBCA site inspection in 2013 identified that the vegetation was regionally significant, there were hollows for black cockatoos and wrp scats/habitat, along with habitat for threatened species of flora.</p> <p>The recommendation from DBCA has been consistent in requesting flora/fauna surveys throughout all previous applications, it is noted that a more recent vegetation survey and fauna survey were undertaken in 2019.</p> <p>Although it is recommended that there be up to date surveys undertaken in 2022.</p> <p>It is likely that the dieback mapping/testing and report should be updated in 2022 to accompany this most recent application as well.</p>	
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**DA20/0437 : Industry - Extractive (Sand) at 157 Haag Road YELVERTON
SECOND ROUND - Responses from 3 December 2021 to 7 January 2022**

		A DBCA accredited/certified dieback consultant should be engaged to undertake a full sampling/mapping/surveying exercise and submit to City of Busselton/DWER and DBCA.	
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13.2 AMENDMENT NO. 53 TO LOCAL PLANNING SCHEME NO. 21 (SCHEDULE 9 - EXEMPTED ADVERTISEMENTS) - CONSIDERATION FOR INITIATION FOR ADVERTISING

STRATEGIC THEME	LIFESTYLE - A place that is relaxed, safe and friendly with services and facilities that support healthy lifestyles and wellbeing
STRATEGIC PRIORITY	2.8 Plan for and facilitate the development of neighbourhoods that are functional, green and provide for diverse and affordable housing choices.
SUBJECT INDEX	Planning Scheme
BUSINESS UNIT	Development Services
REPORTING OFFICER	Manager Development Services - Lee Reddell
AUTHORISING OFFICER	Director, Planning and Development Services - Paul Needham
NATURE OF DECISION	Legislative: adoption of "legislative documents" such as local laws, local planning schemes and local planning policies
VOTING REQUIREMENT	Simple Majority
ATTACHMENTS	Nil

OFFICER RECOMMENDATION

That the Council resolves to:

1. In pursuance of the *Planning and Development (Local Planning Schemes) Regulations 2015*, initiate Amendment No. 53 to the *City of Busselton Local Planning Scheme No. 21* for community consultation, for the purposes of:
 - (a) Amending Schedule 9 "Exempted Advertisements" Clause (B) "Any advertisement will require development approval if it" to include an additional provision requiring development approval for certain forms of signage (including digital signage), as follows:
 9. Is in the form of:
 - (a) a digital display, illumination or radio;
 - (b) an animation or movement in its design or structure; or
 - (c) retro-reflective or fluorescent materials in its design or structure.
2. Pursuant to Regulation 35 (2) of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Regulations), determine that Amendment No. 48 is a 'standard amendment' in accordance with r. 34 of the Regulations as it is:
 - (a) an amendment that would have minimal impact on land in the Scheme area that is not the subject of the amendment;
 - (b) an amendment that does not result in any significant environmental, social, economic or governance impacts on land in the Scheme area; and
 - (c) an amendment that is not a complex or basic amendment.
3. Note that, as the draft Amendment is in the opinion of the Council consistent with Part V of the Planning and Development Act 2005 (Act) and Regulations made pursuant to the Act, upon preparation of necessary documentation, the draft Amendment be referred to the Environmental Protection Authority (EPA) as required by the Act, and on receipt of a response from the EPA indicating that the draft Amendment is not to be subject to formal environmental assessment, be advertised for a period of 42 days, in accordance with the Planning and Development (Local Planning Schemes) Regulations 2015. In the event that the EPA determines that the draft Amendment is to be subject to formal environmental assessment, this assessment is to be prepared prior to advertising of the draft Amendment.

EXECUTIVE SUMMARY

Council is requested to consider initiating proposed Scheme Amendment No. 53 (the Amendment) to the City of Busselton Local Planning Scheme No. 21 (the Scheme). The Amendment would facilitate clarification that illuminated, animated or digital advertising signage is not exempt from the requirement for development approval. Signage of this nature could still be considered through the development application process but would not be exempt. It is recommended that the proposal be supported, and that the Amendment be initiated/adopted for the purpose of community consultation.

BACKGROUND

Schedule 9 (previously 14) was included in the Scheme with the final omnibus amendment to District Planning Scheme No. 20, to incorporate relevant sections from the former Signs Local Law. The Schedule was amended in August 2017 and has since been renumbered several times. For advertisements within the Scheme area, Clause 6.1.1 (d) provides for the Schedule 9 exemptions for development approval.

In addition, clause 4.41 Prohibited Advertisements specifies:

“Advertisements that advertise goods or services which are not produced, displayed or offered for sale on the land which the advertisement is located, are prohibited”.

OFFICER COMMENT

The purpose of the proposed Amendment is to resolve uncertainty recently noted in respect to animated or digital signage which, despite guidance provided in Local Planning Policy 4.12 ‘Advertisements and Advertising Signs’ (LPP 4.12) seeking to limit this type of signage, could be exempt in some cases through Schedule 9 of the Scheme.

The substantive content of Schedule 9 relates to the City’s former Signs Local Law, the relevant provisions of which were incorporated into the final omnibus amendment to Scheme 20 when the Local Law was revoked. The provisions of Schedule 9 have not been significantly reviewed since that time and as such, do not adequately consider or address new forms of animated and digital signage (such as LED signs) that are now commonplace.

Schedule 9 of the Scheme exempts advertising such as For Sale Signs, Wall Signs or Display Home Signs as listed in Part (A) subject to certain conditions, such as the height of the signage above ground level. The definition of “advertisement” in the Deemed Provisions (which form part of every scheme) includes illuminated signs. The unintended consequence is that illuminated wall signs, such as an LED sign, could be argued to be exempt.

Consideration of this issue has arisen through a recent Joint Development Assessment Panel development application which proposed two large LED signs attached to the wall of a Shop within the Vasse Village that would be visible from Bussell Highway. In that case, the applicant argued that the signs, which were approximately 6.8-7m in height, ought to be considered favourably for approval on the basis that they would otherwise be exempt had they been limited to no greater than 5m in height in accordance with Part (A) clause 15 which states:

“(A) Subject to (B) below, the following advertisements located on privately owned land are exempt from requiring development approval:

...

15. All advertisements affixed to any shop, bulky goods showroom or other uses appropriate to a shopping area, below the top of the awning or, in the absence of an awning, below a line measured at 5 metres from the ground floor level of the building.”

There are no subsequent provisions in Part (B) of Schedule 9 that specifically trigger the need for a development approval for advertising signage that is illuminated, animated or digital in nature which means that if the signs could reasonably be considered as 'Wall Signs' and limited to no greater than 5m in height (from the ground floor level of the building) they would arguably be exempt.

This creates some confusion when considered in light of the guidance provided in Local Planning Policy 4.12 'Advertisements and Advertising Signs', adopted by Council in January 2021, which seeks to restrict commercial 'animated' signage to Local Centres and to cap any such signage to one animated sign per centre.

Animation is defined by LPP 4.12 as:

"Animation" means the movement or the appearance of movement through the use of patterns of lights, changes in colour or light intensity, computerized special effects, video displays, or through any other method.

It was the City's intention to capture digital (eg: LED) signage under the banner of 'animated' signage when drafting LPP 4.12 however more robust wording, similar to provisions used in other schemes, is now proposed within the Scheme to ensure that it is clear that illuminated, animated and digital signage is not exempt from the requirement to obtain development approval.

The proposed Amendment does not seek to prohibit such signage, rather to ensure that it be suitably considered in the context of the development, local character and any relevant Scheme and Policy provisions through the development application process.

It is noted that a full review of Schedule 9 and LPP 4.12 is considered necessary at some point, with the possible recommendation to delete Schedule 9 of the Scheme and to instead include any relevant exemptions for advertisements in the LPP, as is permitted by the Regulations.

Statutory Environment

The key statutory documents relevant to this proposal include the *Planning and Development Act 2005*, the *Planning and Development (Local Planning Schemes) Regulations 2015*, and the relevant objectives and provisions of the *City of Busselton Local Planning Scheme No. 21*. Each is discussed below under appropriate subheadings.

Planning and Development Act 2005

The *Planning and Development Act 2005* outlines the relevant considerations when preparing and amending local planning schemes. The relevant provisions of the Act have been taken into account in preparing and processing this Amendment.

Planning and Development (Local Planning Schemes) Regulations 2015

The *Planning and Development (Local Planning Schemes) Regulations 2015* (the Regulations), which came into operational effect on 19 October 2015, identify three different levels of amendments – basic, standard and complex. The resolution of the local government is to specify the level of the amendment and provide an explanation justifying this choice. The Amendment is considered to be a 'standard' amendment for reasons outlined in Part 2 of the Officer Recommendation.

Local Planning Scheme No. 21

Clause 6.1 'Permitted Development' of LPS 21 outlines development which is exempt from requiring development approval. Exemptions for advertising signage are established Clause 6.1.1 (d) as follows:

- (d) *the erection, placement or display of any advertisement and the use of land or buildings for that purpose as exempted by Schedule 9, except in respect of a place included in the Heritage List or in a heritage area; and*

The exemptions are set out in Schedule 9 (A):

- (A) *Subject to (B) below, the following advertisements located on privately owned land are exempt from requiring development approval:*
1. *A For Sale Sign or an Institutional Sign less than 2.2m² in size, with a maximum width / length of 2.0 metres, provided that there is no more than 1 For Sale Sign or an Institutional Sign on each street frontage of a lot.*
 2. *An advertisement less than 0.2m² in size erected or affixed on the street alignment or between that alignment and the building line to indicate the name and occupation or profession of the occupier of the property.*
 3. *Advertisements affixed inside or painted on a shop window by the occupier thereof and relating to the business carried on therein.*
 4. *Advertisements which are not visible from a public space outside the boundaries of a property.*
 5. *Advertisements containing changeable public notices or information not larger than 0.7 metres by 0.9 metres in size located on advertising pillars or panels approved by or which have the prior approval of the City for the purposes of displaying public notices or information.*
 6. *A Wall Sign on a residential multiple dwelling or grouped dwelling indicating the name of the building provided that the advertisement comprises of letters and numbers only, and those letters and numbers do not individually exceed 300mm in height.*
 7. *Advertisements used solely for the direction and/or control of people, animals and/or vehicles or to indicate the name, and/or street number of a premises, providing the area of any such advertisement is less than 0.2m² in size and the advertisement is located wholly within the boundaries of land owned by a person who erected or who maintains the advertisement.*
 8. *An advertisement that is required by the Builders Registration Board or other government or statutory bodies or authorities on building sites, providing any such advertisement is less than 1.5m² in size and that any such advertisement is removed within 7 days of completion of the building works on the building site.*
 9. *An advertisement which is a heritage or memorial plaque not exceeding 1m² in size.*
 10. *An advertisement which does nothing other than indicate an exit or exits, warn of the existence of a hazard or indicate that smoking is prohibited on particular premises and which does not exceed 0.5m² in size.*
 11. *An Information Panel erected within a site used or occupied by a tourist, recreational, cultural, religious or other community organisation that does not exceed 2.0m² in size or 1.5 metres in height.*

12. *An advertisement not exceeding 0.6m² in size that advertises an approved non-residential land use within the Residential zone.*
13. *A Display Home Sign in the Residential zone not exceeding 2m² in size.*
14. *An advertisement attached to or painted on the wall of a building other than a residential building that identifies the name of the building or business operating from the building, where the total area of advertising is not greater than 5m² per wall.*
15. *All advertisements affixed to any shop, bulky goods showroom or other uses appropriate to a shopping area, below the top of the awning or, in the absence of an awning, below a line measured at 5 metres from the ground floor level of the building.*
16. *Advertisements within any lot or on any building that is situated in an Industrial Area provided:*
 - (a) *Advertisements applied to or affixed to the walls of the building do not:*
 - (i) *exceed a maximum of four advertisements per building;*
 - (ii) *exceed an area of 6m² for individual advertisements;*
 - (iii) *exceed a maximum total area of 10m² per building;*
 - (iv) *project above the eaves or the ridge of the roof of the building;*
 - (v) *project from a building whether or not those advertisements are connected to a pole, wall or other building; and*
 - (b) *free standing advertisements do not exceed:*
 - (i) *a maximum of two free-standing advertisements per lot;*
 - (ii) *5m in height above ground level; and*
 - (iii) *a maximum total area of 15m² per lot.*

Schedule 9 (B) sets out specific circumstances where development approval is required for advertisements, and this amendment seeks to include an additional requirement as Clause (B) 9 (as set out in Part 1 (a) of the Officer Recommendation).

(B) Any advertisement will require development approval if it:

1. *Advertises goods or services which are not produced, displayed or offered for sale, or which is otherwise not relevant to, the land upon which the advertisement is located.*

Note: Advertisements that advertise goods and services which are not produced, displayed or offered for sale, or which is otherwise not relevant to, the land upon which the advertisement is located, are prohibited as specified by clause 4.41.
2. *Is located so as to cause an unreasonable impediment to the safe operation of an adjoining road or footpath.*
3. *Is likely to be confused with or mistaken for an official traffic light or sign or so as to contravene the Main Roads Act 1930 or the Regulations made thereunder.*
4. *Is located more than 3 metres above the ground level immediately adjacent to it (where a specific height limit is not specified at (A) (1)-(16) above).*

5. *Is located upon or inside a vehicle adapted and exhibited to primarily facilitate advertising.*
6. *Is in the form of a balloon or air blimp.*
7. *Is located to form a part of, or is attached or affixed to a fence or wall which is forward of the approved building setback for any lot in the Industrial zone.*
8. *Is located underneath a verandah and does not afford a minimum head clearance of 2.75 metres above the ground level immediately adjacent.”*

Relevant Plans and Policies

Local Planning Policy No. 4.12 Advertisements and Advertising Signs is used to guide the development assessment of advertisements. The intent of LPP 4.12 is to set standards relating to the design and placement of Advertisements and Advertising Signs and where specific types of signage are not permitted.

LPP 4.12 provides development standards for static illumination and animated advertisements which relate to the additional text proposed by this amendment to include digital (eg: LED) signage.

Financial Implications

There are no financial implications associated with the officer recommendation.

Stakeholder Consultation

If the Council resolves to initiate the proposed Amendment, the relevant documentation would be referred to the Environmental Protection Authority (EPA) for consideration of the need for formal assessment under Part IV of the *Environmental Protection Act 1986*. Should the EPA resolve that the Amendment does not require formal assessment, the document will be advertised for 42 days in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015*.

Risk Assessment

An assessment of the potential implications of implementing the officer recommendation has been undertaken using the City's risk management framework, with risks assessed taking into account any controls already in place. No risks of a medium or greater level have been identified.

Options

As an alternative to the Officer Recommendation the Council could:

1. Request modifications to the proposed Amendment before advertising.
2. Decline the initiation of the proposed Amendment for advertising for reasons to be identified and explained.

The assessment has not revealed any substantive issue or reasonable grounds that would support either of the above options.

CONCLUSION

The Amendment provides for the clarification of development application requirements relating to advertisements and specifically addresses that certain types of signage, such as illuminated, animated or digital signage (including LED signs), are not exempt from the requirement for development assessment.

Officers are recommending that the Council supports the initiation of the Amendment for public advertising.

TIMELINE FOR IMPLEMENTATION OF OFFICER RECOMMENDATION

The implementation of the Officer Recommendation will include referring the Amendment to the Environmental Protection Authority, which will occur within two weeks of the date of the Council decision.

14. ENGINEERING AND WORK SERVICES REPORT

Nil

15. COMMUNITY AND COMMERCIAL SERVICES REPORT**15.1 MARKETING AND EVENTS REFERENCE GROUP OUTCOMES**

STRATEGIC THEME	LIFESTYLE - A place that is relaxed, safe and friendly with services and facilities that support healthy lifestyles and wellbeing
STRATEGIC PRIORITY	2.5 Facilitate events and cultural experiences that provide social connection.
SUBJECT INDEX	MERG
BUSINESS UNIT	Commercial Services
REPORTING OFFICER	Events Coordinator - Peta Tuck
AUTHORISING OFFICER	Director, Community and Commercial Services - Naomi Searle
NATURE OF DECISION	Executive: Substantial direction setting, including adopting budgets, strategies, plans and policies (excluding local planning policies); funding, donations and sponsorships; reviewing committee recommendations
VOTING REQUIREMENT	Absolute Majority
ATTACHMENTS	Nil

OFFICER RECOMMENDATION

That the Council:

1. Endorses funding allocations towards the following events, to be funded from the 2021/22 Events Budget:

Event	Funding Allocation
Bare Naked Theatre- Mamma Mia production	\$6,500
2022 Football West Regional Festival of Football	\$3,000 cash (+ up to \$500 in kind)
Dunsborough SWFL Season 2022	\$40,000
Film Proposal – ‘Inheritance’	\$10,000
Busselton City Football Club – 100 year celebration	\$5,000
TOTAL	\$64,500 (+ up to \$500 in kind)

2. Endorses funding allocations towards the following events, to be funded from the 2022/23 – 2024/25 Events Budget:

Event	Funding Allocation
CinefestOZ – additional funding	2022/23 - \$40,000 2023/24 - \$40,000 2024/25 - \$40,000
TOTALS	2022/23 - \$40,000 2023/24 - \$40,000 2024/25 - \$40,000

3. Endorses funding allocations towards the following initiatives, to be funded from the 2021/22 Marketing Budget:

Proposal	Funding Allocation
Creative Corner – Creative Community Activation	\$6,200
TOTAL	\$6,200

4. Endorses funding allocations towards the following initiatives, to be funded from the 2022/23 Marketing Budget:

Proposal	Funding Allocation
Visage Productions – Our Town television series	\$35,000
TOTAL	\$35,000

5. Endorses the alteration of the payment schedule for Cabin Fever Festival 2022 – 2024, to be paid from the 2021/22 – 2024/25 Events Budget:

Festival Year	Current Schedule	Proposed Schedule
2022	2022/23 - \$40,000	2021/22 - \$10,000 2022/23 - \$30,000
2023	2023/24 - \$40,000	2022/23 - \$10,000 2023/24 - \$30,000
2024	2024/25 - \$40,000	2023/24 - \$10,000 2024/25 - \$30,000
TOTALS	2022/23 - \$40,000 2023/24 - \$40,000 2024/25 - \$40,000	2021/22 - \$10,000 2022/23 - \$40,000 2023/24 - \$40,000 2024/25 - \$30,000

EXECUTIVE SUMMARY

A meeting of the Marketing and Events Reference Group (MERG) was held Wednesday 16 March 2022. This report presents the recommendations from this meeting.

BACKGROUND

At the Ordinary Meeting of Council held 13 April 2011, Council resolved (C1104/114) to endorse the implementation of a differential rating system whereby properties rated industrial and commercial across the City would directly contribute toward the City's continued support of tourism, marketing and event activities. The City also established a key stakeholders reference group, known as the 'Marketing and Events Reference Group' (MERG), to make recommendations to Council with respect to the marketing and events budget allocations.

At its meeting of 22 June 2011, Council resolved (C1106/201) to introduce a 3% Differential Rate on industrial and commercial rated properties which has increased over time to 10%. The proceeds from the differential rate are allocated towards funding events and marketing.

The adopted 2021/22 budget for marketing and events totals \$1,196,700. The breakdown of the budget is as follows:

- \$924,900 – Events;
- \$231,800 – Marketing and economic development initiatives;
- \$40,000 – City-led events.

This excludes budget allocations for Leavers Week, administration and events staffing.

The proposed 2022/23 budget for marketing and events totals \$1,012,888. The breakdown of this budget is as follows:

- \$759,666 – Events;
- \$253,222 – Marketing and economic development initiatives.

Through the budget process, it will be determined whether any of the Events budget will be allocated towards City led events.

A MERG meeting was held on Wednesday 16 March 2022, with the following matters presented:

- updates in events held since the last meeting on 24 November 2021 and upcoming major events;
- consideration of funding applications for the 2021/22 – 2024/25 events and marketing budgets.

OFFICER COMMENT

Supporting the development and attraction of new Events throughout the year, the City's Events Sponsorship Programme promotes the City of Busselton as an attractive event tourism destination. At the MERG meeting held 16 March 2022 a range of requests for events funding were considered as outlined below.

Requests for Funding – 2021/22 Events Budget

The following requests have been received from the 2021/22 events Budget:

Mamma Mia Stage Production – Bare Naked Theatre

Bare Naked Theatre will be staging a production of the acclaimed musical Mamma Mia in Busselton over a period of 10 days, from 11-22 March 2022. In the absence of a dedicated performing arts space, and being unable to utilise the Weld Theatre due to upgrade works and size of the venue, Bare Naked Theatre will be utilising the High Street Hall and will need to bring in all the staging, lighting and production requirements.

Bare Naked Theatre have been able to secure the hire of the Mamma Mia stage set which will be used at the Regal Theatre in Perth in March, and add an increased level of professionalism to the Busselton Production.

Bare Naked Theatre are seeking sponsorship from the City to assist with venue hire, marketing, promotion and equipment hire costs. Their total budget is \$98k, and they are seeking sponsorship of \$6.5k from the City.

MERG recommendation is to support Bare Naked Theatre's request of \$6.5k, to be funded from the adopted 2021/22 Events Budget. This will enable them to proceed and source necessary equipment to stage a production of this calibre in a facility that does not have the supporting infrastructure in place.

2022 Football West Regional Festival of Football

The City received a request to sponsor the Regional Festival of Football, to be held in Busselton on Saturday 14 May 2022. The event consists of a week long program of activities which may include open training sessions, school clinics, coaching and referee courses and workshops, a MiniRoos coaching certificate, and a Hyundai Club development workshop. This week then cumulates in a National Premier Leagues WA double-header for the Perth Glory Men's and Women's teams on Saturday 14 May.

The event involves 100 players and officials, approximately 1400 spectators, 300 school children and 20 community coaches and referees. 25% of participants will come from outside the region.

The requested funding support for the event is \$3k, plus in-kind venue hire of Barnard Park sporting grounds up to \$500. MERG recommendation is to support the requested amount, as this represents a small investment for the economic outcomes of hosting matches of this calibre.

Busselton City Football Club – 100 year celebration

The City received a request to sponsor the Busselton City Football Club's 100 year celebrations, to be held on Saturday 25 June. Their request for support is to go towards the following activities:

- Memory Lane Historical project of a timeline display and additional video presentation – design, printing and display;
- Historical storage of the clubrooms – a construction of a display at the clubrooms for storage of important memorabilia;
- Presentation Gala Evening with special guests and presentations – to be held at the Esplanade Hotel;
- Junior events (may be on a separate weekend to the Gala evening due to volunteers) – full day of events with a junior celebration on the morning (bouncy castles etc. at the club/ Churchill Park) followed by an under-18's silent disco.

Current and past players and supporters will be invited to join in the celebrations.

The requested funding support for the event is \$16k. MERG recommendation is to allocate an amount of \$5k towards the event. This lesser amount is recommended, as this is in line with what other similar events are funded.

Dunsborough Football Club – South West Football League inaugural season

The Dunsborough Football Club has been accepted into the South West Football League (SWFL) for the first time in history. This will be the first club to join the league in over 15 years and the first club to join any football association in WA in over 35 years. The acceptance into the league provides immense opportunity for youth engagement, social connection, mental health and physical exercise through the connection of a community.

As such, to meet the requirements of the SWFL there needs to be a certain minimum level of infrastructure in place to accommodate these events.

Currently the facilities at the Dunsborough Playing Fields do not meet these requirements, as outlined in the City of Busselton's Sport and Recreations Facilities Strategic Plan. Through ongoing discussion between the City and the Dunsborough Football Club, and in light of the future master planning work for the Dunsborough Playing Fields, temporary facilities were agreed as the best options to meet the SWFL requirements for this inaugural season.

Due to the scale and nature of the home fixtures, the expected number of visitors, the need for traffic management, advertising and communications, and positive social outcomes, it was agreed that these dates should be treated as 10 events over the course of the winter season.

Each event will include 3 SWFL football games with Dunsborough hosting each of the other clubs, one at a time, with all but Busselton Football Club travelling from out of the City of Busselton region.

Dunsborough Football Club are seeking \$40k in funding for these 10 events, on the basis of \$4k per event. The funds will be used to specially contribute to the cost of hiring temporary/transportable facilities in order to host these events to the required level set by the SWFL.

Funding support for sporting fixtures through MERG is unusual, however given the unique circumstances, level of visitation and local social outcomes these games will achieve, MERG recommend to support this request as a one off only, with organisers to be advised that further years fixtures would need to be funded from other sources.

Dunsborough Football Club will be required as a condition of funding to provide detail around their engagement with visitors and local residents, businesses and accommodation providers to ensure that the region is promoted in conjunction with the fixture games.

Film Proposal – 'Inheritance'

A proposal has been received to provide funding for a short drama film 'Inheritance' to be filmed in the City of Busselton and across the South West. This film is written by Myles Pollard and Ben Morley, directed by Myles Pollard and produced by Jasmine Leivers and Myles Pollard.

Inheritance is a short drama film that tells the story of recently paroled prisoner, John Barker, whose dying grandfather gives him a journal containing the story of his convict ancestor, Wilson Barker. Delving into his own history, John learns that his family's turbulent past may have in some way contributed to his own recent skirmishes with the law. In order to move forward, John must look back and understand his psychological inheritance.

Inheritance was inspired by the true story of writer/director Myles Pollard's convict ancestry. Wilson Barker was one of the last convicts transported to Perth on the 4th April 1866 of the ship, the Belgravia, for stealing cloth and eventually settled in Vasse in WA's southwest. Wilson Barker is buried in the Busselton Cemetery. Inheritance is very culturally significant to WA, showcasing a formative chapter in the state's history. WA was a tough place to live in the early to mid-19th Century and the regions resilience, adaptiveness and resourcefulness was built on the back of its convict heritage.

The film is set across two timelines, one in the present and the other in 1866. All the present day drama will be filmed conventionally while the period component will be animated. As John explores his history, compiled in a scrapbook given to him by his pop, the pages of notes, reproductions and scribbles come to life in the form of a two dimensional 'flip-book' animation.

The aim is to shoot towards the end of 2022 when the weather is mostly clear and aim to complete post production by the end of the financial year in 2023 so that the film can premiere at CinefestOZ in Busselton if it is accepted into the program. The film will be entered into film festivals throughout WA, nationally and internationally, with the aim to get on as many screens and in front of as many people as possible throughout the world.

The total budget the organiser is aiming to raise is \$150,000, with \$33,070.50 raised so far through donations on the Australian Cultural Fund fundraising campaign.

<https://artists.australianculturalfund.org.au/s/projects?searchterm=inheritance&sortby=CreatedDate%2520DESC>

The organiser has requested \$10k in City sponsorship.

MERG recommendation is to support the requested amount of \$10k, to be funded from the adopted 2021/22 Events Budget as this is a unique opportunity to showcase another aspect of the region's history, and shows the City's support as a film friendly region.

In summary, MERG recommend the following, to be funded from the adopted 2021/22 Events Budget:

Event Name	Requested	MERG Recommendation
Bare Naked Theatre – Mamma Mia production	\$6,500	\$6,500
2022 Football West Regional Festival of Football	\$3,000 cash (+ up to \$500 in kind)	\$3,000 cash (+ up to \$500 in kind)
Dunsborough SWFL Season 2022	\$40,000	\$40,000
Film proposal – ‘Inheritance’	\$10,000	\$10,000
Busselton City Football Club – 100 year celebration	\$16,000	\$5,000
TOTAL	\$75,500 (+ up to \$500 in kind)	\$64,500 (+ up to \$500 in kind)

Requests for Funding – 2022/23 – 2024/25 Events Budget

CinefestOz

Since its inception in 2008, CinefestOZ has become one of the City's hallmark events, attracting visitation in winter months and growing in stature as one of Australia's premiere film festivals. CinefestOZ had reached the end of their previous sponsorship agreement, which was for an amount of \$120k in 2019/20, 2020/21 and 2021/22 respectively. CinefestOZ has applied for a multi-year agreement from 2022/23 – 2024/25 for an amount of \$160k per year.

At the meeting of 24 November 2021, it was felt that their application lacked sufficient information to award an increase in funding, and therefore a recommendation was made to Council to retain the funding at the previous level of \$120k per year from the 2022/23, 2023/24 and 2024/25 Events Budgets. Council endorsed (C2112/122) this recommendation at the meeting of 8 December 2021.

Subsequently, CinefestOZ provided a presentation to MERG members, outlining the proposed use of the additional funds, broken down into the following three areas:

- \$15k – expansion of the CinefestOZ Industry Program (providing opportunities to leverage the City of Busselton’s Film Friendly destination status);
- \$15k – extending the free Community Day incorporating IndigefestOZ beyond a pilot and into a regular feature of the event;
- \$10k – Engagement of a National Publicist to build interstate profile and visitation, and leverage the direct flight to Busselton Margaret River Airport.

MERG recommend that CinefestOZ are funded for the requested additional \$40,000 per annum for the next three years, evaluated annually for impact and outcomes after each year’s event and prior to the next year’s funding being provided. The funding agreement will reflect payment schedules and terms, reporting obligations, key performance indicators/milestone/outcomes to be achieved and acknowledgement/branding requirement, and will be reviewed by MERG prior to execution by all parties.

CinefestOZ will also be required to submit their Strategic Plan to MERG, once finalised, to clarify their sustainability plan, risks and opportunities to grow audiences and visitation to the event in the City of Busselton.

In summary, MERG recommend the following to be funded from the 2022/23 – 2024/25 Events Budgets:

Event Name	Requested	MERG Recommendation
CinefestOZ – additional funding	2022/23 \$40,000	2022/23 \$40,000
	2023/24 \$40,000	2023/24 \$40,000
	2024/25 \$40,000	2024/25 \$40,000
TOTALS	2022/23 \$40,000	2022/23 \$40,000
	2023/24 \$40,000	2023/24 \$40,000
	2024/25 \$40,000	2024/25 \$40,000

Requests for Funding – 2021/22 Marketing Budget

Creative Corner – Creative Community Activation

The City has received a proposal from Creative Corner to deliver networking and events specifically designed to encourage cross-pollination and reduce silos across the City’s creative professionals, to support increased opportunity for these practitioners and engagement with the City.

The objectives of the projects are as follows:

- Provide opportunity to unite creative professionals currently living and working within the City of Busselton;
- Facilitate networking events to encourage practitioners to collaborate on establishing sustainable creative projects and break down ‘silos’;
- Secure high-value workshops for creative practitioners within the City of Busselton to provide upskilling opportunities to further support their professional practice.

The activities proposed consist of the following:

- 3 x Creative Cleanser events held in the City of Busselton;
- Minimum three local creatives to present/speak at each;
- 3 weeks promotion of each event (minimum);
- Co-branded with City of Busselton on all associated communications and socials;
- Final report provided back to the City outlining feedback, attendance numbers and summary of the workshops and networking delivered.

The requested funding amount is \$6,200, to be funded from the 2022/23 Marketing Budget.

MERG recommendation is to support the requested funding amount as this program supports outcomes identified in the City's Industry Sector Analysis Report and economic development strategies.

In summary, MERG recommend the following to be funded from the 2021/22 Marketing Budget:

Proposal	Requested	MERG Recommendation
Creative Corner – Creative Community Activation	\$6,200	\$6,200
TOTALS	\$6,200	\$6,200

Requests for Funding – 2022/23 Marketing Budget

Visage Productions – Our Town television series

The City has received a proposal from Visage Productions, to be featured in the Our Town television series to be filmed mid-2022 and aired late in 2022. The City previously participated in this show in 2018/19.

The proposal for the 2022 series is as follows:

- Total budget of \$40k ex GST, via a collaborative effort (note the City contributed \$20k in the 2018/19 series);
- A City of Busselton episode around the City's growth story;
- Each episode is made up of four, five-minute segments, with potential to include multiple partners, however, the aim is always to look like one complete story on a designated region;
- Potential for the City to 'buy out' an episode to have greater control of the wider storyline, which would be discounted;
- The projected ten-episode series will be broadcast throughout Australia later in 2022, on the Seven TWO Network, Australia's highest rating free-to-air digital television multichannel, on a weekend afternoon;
- After broadcast the episodes will be added to the Seven Network on-line catch-up service 7+;
- Filming for the series to commence from mid-2022, during the 2022-2023 financial year;
- The overall aim of the series model is to promote why people should visit, live, work, play and invest in regional and metropolitan locations throughout Australia.

The cost to the City shared with other partner organisations is \$20k, however if the City would prefer to produce the whole episode from a City of Busselton perspective and retain ownership of all segments, the cost is discounted to \$35k.

MERG recommendation is to allocate \$35k towards the episode, to retain ownership and full control of the content aired.

In summary, MERG recommend the following to be funded from the 2022/23 Marketing Budget:

Proposal	Requested	MERG Recommendation
Visage Productions – Our Town television series	\$35,000	\$35,000
TOTALS	\$35,000	\$35,000

Cabin Fever – alteration to payment schedule

At the meeting of 8 December 2021 (C2112/112) Council endorsed the allocation of \$40k per year to the Cabin Fever Festival, to be paid from the 2022/23 – 2024/25 Events Budgets.

Due to the timing of the Cabin Fever Festival in July each year, funds are not normally paid until the new financial year starts. Event organisers have requested an alteration to their payment schedule to allow them some funds to pay for suppliers for services such as marketing, website design and PR that need to occur in the months leading up to the Festival. They have requested that they receive a first milestone payment upon signing for the first year of the agreement, then three months prior to the Festival in years two and three of the agreement.

The requested payment schedule will be as follows:

Festival Year	Current Schedule	Proposed Schedule
2022	2022/23 - \$40,000	2021/22 - \$10,000 2022/23 - \$30,000
2023	2023/24 - \$40,000	2022/23 - \$10,000 2023/24 - \$30,000
2024	2024/25 - \$40,000	2023/24 - \$10,000 2024/25 - \$30,000

With sufficient budget remaining in the 2021/22 Events Budget, officer recommendation is that Council support the alteration to the Cabin Fever payment schedule.

Statutory Environment

The officer recommendation supports the general function of a local government under the *Local Government Act 1995* to provide for the good government of persons in its district.

Relevant Plans and Policies

The officer recommendation aligns with the City's Events Policy which provides event organisers with information on the event application and approval process and event sponsorship guidelines.

Financial Implications

At the Council meeting of 26 July 2021 Council resolved (C2107/138) to include an allocation of \$1,196,700 in the 2021/22 Marketing and Events Budget, which contains the following allocations:

- \$924,900 towards event sponsorship;
- \$231,800 towards Marketing and Economic Development initiatives; and
- \$40,000 towards City run events.

In addition to the above allocation for event sponsorships, and amount of \$55,500 was carried over from the 2020/21 Events Budget due to the approved carry-over of \$38k from the CinefestOZ 2020 event and the rescheduling of two events into the 2021/22 financial year (Raising the Vibe concert \$5k, Margaret River Region Open Studios \$12.5k). Therefore the overall 2021/22 Events Budget is \$980,400.

Funds currently committed from the 2021/22 Events Budget through multi-year agreements and Round 1 of the Event Sponsorship program totals \$799,500. In addition, \$110,000 was allocated towards the development of the 2022 Winter Wonderland event, which will now not be proceeding.

This leaves a balance of \$180,900 in the 2021/22 Events Budget for any further event attraction or initiatives. As detailed above, Officers have recommended the allocation of \$64,000 cash plus \$500 in kind support towards events, leaving \$166,400 in the 2021/22 Events Budget if endorsed by Council.

In addition to the \$231,800 allocated towards Marketing and Economic Development initiatives, an amount of \$45,000 was carried over from the 2020/21 Marketing Budget due to two funded projects not having been completed (Tourism Information Bay Signage \$5k, Event Strategy review \$40k). Therefore the overall Marketing Budget is \$276,800.

Funds currently committed from the 2021/22 Marketing Budget total \$158,625 (Airport Marketing Reserve \$50k, Busselton Performing Arts and Convention Centre (BPACC) \$50k, update of the City's Events Strategy 40k, update of tourism signage \$5k, and allocations through Round 1 \$13,625) leaving a balance of \$118,175 remaining for any further initiatives. As detailed above, Officers have recommended the allocation of \$6,200 towards marketing initiatives, leaving \$111,975 in the 2021/22 Marketing Budget if endorsed by Council.

Funds committed through the 2021/22 City run events budget currently total \$22,926, leaving \$17,074 remaining in the budget for any further initiatives.

There is also a balance of \$219,852 remaining in the Marketing and Area Promotions Reserve, as well as the \$200k carried over for the development of the electronic billboard.

The proposed 2022/23 budget for marketing and events totals \$1,012,888. The breakdown of this budget is as follows:

- \$759,666 – Events
- \$253,222 – Marketing and Economic Development Initiatives.

Funds currently committed from the 2022/23 Events Budget through multi-year agreements total \$623,500, leaving a balance of \$136,166 for the 2022/23 event sponsorships and any other events. Through the budget process, it will be determined whether any of the Events budget will be allocated towards City led events.

Stakeholder Consultation

Consultation has been undertaken with MERG members with representatives comprising the Busselton and Dunsborough Yallingup Chambers of Commerce and Industry, MRBTA, Busselton Jetty Inc. and the City of Busselton.

Risk Assessment

An assessment of the potential implications of implementing the officer recommendation has been undertaken using the City's risk management framework, with risks assessed taking into account any controls already in place. The officer recommendation does not introduce any risks identified as being of a high or medium level.

Options

Council may choose to not support the recommendations made by MERG and resolve not to endorse part or all of the recommendations.

CONCLUSION

The MERG has been established by Council to make recommendations on the way in which funds raised through the industrial and commercial differential rate for the purposes of the events and marketing are allocated. This report contains the recommendations made at the 16 March 2022 MERG meeting, which if endorsed by Council, will result in the continuation of high quality events being held within the region, supported by successful marketing promotions. All recommendations support Councils vision of being recognised as the 'Events Capital WA'

TIMELINE FOR IMPLEMENTATION OF OFFICER RECOMMENDATION







Following Councils decision, the outcomes will be communicated to MERG members and relevant event/marketing bodies for their information and implemented where required.

16. FINANCE AND CORPORATE SERVICES REPORT

Nil

17. CHIEF EXECUTIVE OFFICERS REPORT

17.1 COUNCILLORS INFORMATION BULLETIN

STRATEGIC THEME	LEADERSHIP - A Council that connects with the community and is accountable in its decision making.
STRATEGIC PRIORITY	4.2 Deliver governance systems that facilitate open, ethical and transparent decision making.
SUBJECT INDEX	Councillors' Information Bulletin
BUSINESS UNIT	Executive Services
REPORTING OFFICER	Reporting Officers - Various
AUTHORISING OFFICER	Chief Executive Officer - Mike Archer
NATURE OF DECISION	Noting: The item is simply for information purposes and noting
VOTING REQUIREMENT	Simple Majority
ATTACHMENTS	Attachment A Current State Administrative Tribunal Reviews   Attachment B LVRMAG Meeting Notes and Action Sheet   Attachment C LVRMAG Communique  

OFFICER RECOMMENDATION

That the items from the Councillors' Information Bulletin be noted:

17.1.1 State Administrative Tribunal Reviews

17.1.2 Lower Vasse River Management Advisory Group

EXECUTIVE SUMMARY

This report provides an overview of a range of information that is considered appropriate to be formally presented to the Council for its receipt and noting. The information is provided in order to ensure that each Councillor, and the Council, is being kept fully informed, while also acknowledging that these are matters that will also be of interest to the community.

Any matter that is raised in this report as a result of incoming correspondence is to be dealt with as normal business correspondence, but is presented in this bulletin for the information of the Council and the community.

INFORMATION BULLETIN

17.1.1 State Administrative Tribunal Reviews

The current State Administrative Tribunal Reviews is at Attachment A.

17.1.2 Lower Vasse River Management Advisory Group

The Lower Vasse River Management Advisory Group (LVRMAG) meeting was held 14 February 2022.

The meeting notes, action sheet and communique are included as Attachment B and Attachment C.

As at 25 March 2022

APPLICATION (Name, No. and City File Reference)	PROPERTY	DATE COMMENCED	DECISION BEING REVIEWED	RESPONSIBLE OFFICER	STAGE COMPLETED	NEXT ACTION AND DATE OF ACTION AS PER SAT ORDERS	DATE COMPLETED / CLOSED
CITY OF BUSSELTON							
Amber Cloud Pty Ltd v City of Busselton	Lot 101 Wilyabrup Road, Wilyabrup	November 2021	Review of a decision to refuse or conditionally grant an application under a planning scheme	Briony McGinty/Joanna Wilson	<ul style="list-style-type: none"> Directions hearing on the 12 November 2021 against the decision of the City to refuse a development application. The matter is listed for Mediation on 7 February 2022. Mediation on 7 February 2022 where it was resolved that: <ul style="list-style-type: none"> - Additional information would be submitted to the City by 22 March; - Mediation listed for 5 April 2022. 	Mediation on 5 April 2022	
Mayfly Property Group Pty Ltd v City of Busselton	Lot 21 (No.64) Espinos Road, Sabina River	February 2022	Review of a decision to refuse or conditionally grant an application under a planning scheme	Ben Whitehill / Joanna Wilson	<ul style="list-style-type: none"> Directions hearing on the 25 February 2022 against the decision of the City to refuse a development application (has not made a determination within 90 days). The matter is listed for Mediation on 9 March 2022. Mediation on 9 March 2022 where it was resolved that: <ul style="list-style-type: none"> - The City would send the applicant a list of concerns by 16 March; - The applicant would submit further information to address the concerns to the City by 30 March 2022 - Mediation listed for 5 April 2022. 	Mediation on 5 April 2022	
Vasse Commercial Pty Ltd v City of Busselton	Lot 9052 (No.210) Northerly St	February 2022	Review of a decision to refuse or conditionally grant an application under a planning scheme	Briony McGinty / Lee Reddell	<ul style="list-style-type: none"> Directions hearing listed for 11 March 2022 against a condition of approval (regarding maximum 6m height of pylon signs) vacated and listed for mediation on 28 April 2022 	Mediation on 28 April 2022	
JOINT DEVELOPMENT ASSESSMENT PANEL							
DCSC Pty Ltd v Presiding Member of the Joint Development Assessment Panel	Lot 108 (No. 57) Dunn Bay Road and Lot 109 (No. 6) Cyrilleen Way, Dunsborough	January 2022	Review of decision to refuse or conditionally grant an application under a planning scheme	Presiding Member of the Regional JDAP	<ul style="list-style-type: none"> Directions hearing on 4 February 2022 Mediation listed for 21 March 2022 	Mediation on 6 April 2022	
Frando Pty Ltd v Presiding Member of the Joint Development Assessment Panel	24 Dunn Bay Road, Dunsborough	March 2022	Review of decision to refuse or conditionally grant an application under a planning scheme	Presiding Member of the Regional JDAP	<ul style="list-style-type: none"> Date of first Directions hearing yet to be confirmed 	TBC	

APPLICATION (Name, No. and City File Reference)	PROPERTY	DATE COMMENCED	DECISION BEING REVIEWED	RESPONSIBLE OFFICER	STAGE COMPLETED	NEXT ACTION AND DATE OF ACTION AS PER SAT ORDERS	DATE COMPLETED / CLOSED
WESTERN AUSTRALIAN PLANNING COMMISSION							
NIL							



MEETING NOTES
NOTES OF THE MEETING OF THE LOWER VASSE RIVER MANAGEMENT ADVISORY GROUP
Held IN THE KALOORUP ROOM, CITY OF BUSSELTON ADMINISTRATION BUILDING
14 FEBRUARY 2022– MEETING COMMENCED AT 10:05am

Attendances:

Members:	
Cr Sue Riccelli	City of Busselton (via Zoom)
Cr Anne Ryan	City of Busselton
Cr Jodie Richards	City of Busselton (via Zoom)
Paul Needham	City of Busselton
Oliver Darby	Director Engineering and Works, City of Busselton
Joel Hall (proxy)	Department of Water and Environmental Regulation
Richard Theobald	Department of Health (via Zoom)
Alan Clarke (proxy)	Department of Biodiversity, Conservation and Attractions
Suzanne Brown	Water Corporation (via Zoom)
Shannon Clohessy	Undalup Association Inc.
Liz Embry	South West Boojarah Working Party
Keith Sims	Community member
Vern Bussell	Community member (via Zoom)
Robin Belford	Geocatch (via Zoom)
Dr Andrew Dickie	Community member
Officers and Guests:	
Mathilde Breton	City of Busselton
Angeline Dewson	City of Busselton
Linda Kalnejais	Department of Water and Environmental Regulation
Apologies:	
Wayne Elliott	Department of Biodiversity, Conservation and Attractions
Rachelle Cousins	Undalup Association Inc.
Absent:	

1. Welcome and Acknowledgement of Country – Cr Sue Riccelli, Chair
The meeting opened at 10:05am.
2. Check in on meeting notes and further information
Nil.
3. Correspondence –
Nil.
4. Sediment removal update - Mathilde Breton
Mathilde gave an update on approvals received for the sediment removal project. Section 40 under the Biodiversity Conservation Act and Section 18 under the Aboriginal Heritage Act have been approved. The Department of Agriculture, Water and the Environment has provided draft approval under the EPBC Act, with conditions to implement the Carter’s Freshwater Mussel Management Plan, the ASS and Dredging Management Plan and the Dewatering and Disposal Management Plan. The draft recommendation for approval is now with the Minister and should be finalised soon.

Mathilde explained how the laydown area for the geotextile bags will be set up In Rotary Park. A copy of the technical drawing was provided to the group. A crane will be used to launch and retrieve the



dredge from the river. The section of river between the pedestrian bridge and the Eastern Link Bridge can't be dredged as it is too constrained, and a buffer has to be maintained for services.

The contractor building the laydown area will also treat the dewatered material for Acid Sulphate Soil and transport it off-site. The sediment removal is due to start in late March/early April, depending on when the contractor finishes dredging an artificial lake in the City of Bayswater.

5. Management of Vasse surge barrier DWER

Linda Klanejais gave a presentation of the Management of Vasse surge barrier. She highlighted the difficulty in managing both the river and Vasse-Wonnerup wetlands

Linda also advised that the December saltwater inflow management worked well from a water quality point of view. But letting saltwater into the estuary has impacted bird life and threatened Carter's Freshwater mussels. Management of the surge barrier is guided by conditions of Section 40 under the Biodiversity Conservation Act. Despite lower water levels than last year, strong easterly winds led to salt water entering the river.

There was a discussion on the impacts of raising water levels on migratory shore birds.

6. Salinity intrusion in Lower Vasse River Presentation - Mathilde/Linda

Vasse Wonnerup Partnership discussed building a temporary sand bund on Ford Road to prevent further salt from entering the river. The City will undertake the works, with guidance from the Vasse Wonnerup Partnership and Water Corporation will fund the work.

There was a discussion on why a permanent structure was not pursued for the time being.

7. Closing of Vasse Diversion Drain penstock and sediment removal - Suzanne Brown (Water Corp)

Suzanne Brown advised that the penstocks are not operating as designed due to the build-up of sediment and weed downstream. Water Corporation will close the culverts for the next 6-8 weeks to dredge a 200m section of the river

8. New community member - Mathilde Breton

Mathilde provided an update on seeking a new community member. Advertising closes 18/02/2022, have only received one application despite doing extensive promotion via local papers, social media and website. Mathilde asked the group if they knew of anyone who may be interested in becoming a member of the group, to ask them to apply. Previous applicants were not deemed to be suitable.

9. General Discussion

a. Phytoplankton sampling regime

Discussion revolved around water sampling procedures, sampling stations current locations and request to re-locate upstream behind Comfort Inn. DWER confirmed water sampling stations located upstream and area covered previously; that any water sampling information obtained can be passed onto DWER; water samples not tested immediately probably due to lack of resources and volume of tests currently required, samples will be frozen for testing at a later date.

b. Warning signs

Signage not available in Vietnamese to alert the fisherman about algal blooms. City Health Officers contacted DoH, and no other signs (templates) exist except for the ones that are currently in place. Other options will be investigated.

Action: Follow-up on warning signage for non-English speakers



c. Mexican waterlily control

There was a discussion around community concerns over using glyphosate to control the Mexican water lilies and potential impacts on Carter's mussels. Mathilde advised that mechanical removal was not very successful and that due to an early start to winter Mexican waterlily were not sprayed last year when the mussels died.

Action: Group to be provided with update/information on what is being proposed for management of lilies this year.

d. Project communication

Mathilde advised the group where the community could source information about the sediment removal project and invited all members to attend a community information session to be held on Thursday 10 March at 5pm in Rotary Park.

e. Health warning notices

There was a discussion on how health warnings due to blue-green algae are communicated. DOH confirmed that warnings are communicated to the lead agency and that DOH can also put out health warning via various media.

f. DOH BGA factsheet

DOH confirmed that they are following the latest World Health Organisation (WHO) guidance on how to manage health risks associated with blue-green algae.

10. Wrap up – The Chair thanked the group for their attendance.

11. Next meeting

28 March 2022 at 10:00am

12. Close of meeting

Meeting closed at 11:55am



LOWER VASSE RIVER MANAGEMENT ADVISORY GROUP
2020/21 ACTION SHEET
14-February-2022

No.	Date	Action	Responsibility	Status Update
3	24/06/2020	Supply a break-down of the \$6.4 million funding allocation to the group when available.	Paul Needham	waiting on information
19	22/02/2021	An induction pack for new members to be put together, and a "buddy" nominated.	Mathilde Breton	induction pack - completed
24	22/02/2021	Environmental Approvals for sediment removal from Butter Factory to Bypass - progress environmental approvals.	Mathilde Breton	In progress
35	19/04/2021	Continue with the spraying of Mexican waterlily to control further spread and maintain open water habitat, while preventing an increase of algal blooms in these areas.	Mathilde	in progress
37	19/04/2021	Discuss obtaining of funding from private businesses at a subsequent meeting.		not started
40	17/05/2021	Draft community statement for health issues.	Richard	In progress
42	17/05/2021	Provide communication advising that Water Corporation is responsible for the Vasse Diversion Drain, and on culvert management.	Jason	in progress
46	21/06/2021	Department of Health information sheet to be finalised and distributed to the group for review.	Richard	refer item 52
48	16/08/2021	Members to provide feedback on how to further engage with the community on the project.	Members	in progress
54	2/11/2021	Send out literature regarding the use of fountains or aeration to stop algae development, and report on use of sonic treatment to control blue-green algae in lakes.	Joel	not started
56	2/11/2021	Provide information on types of diseases recorded	Richard	not started
60	6/12/2021	Ask for advice from Environment Health whether the Men's Shed and Car Club use either aerobic treatment units (ATUs) or standard septic systems.	Tanya Gillett	in progress
61	14/02/2022	Follow-up on warning signage for non-English speakers	Mathilde	in progress
62	14/02/2022	Group to be provided with update/information on what is being proposed for management of lilies this year.	Mathilde	in progress



LOWER VASSE RIVER MANAGEMENT ADVISORY GROUP COMMUNIQUE (POST MEETING OF 14 FEBRUARY 2022)

1.0 Introduction

The City's Lower Vasse River Management Advisory Group (LVRMAG) met on Monday 14 February 2022. A range of matters of interest to the community were addressed at the meeting, including:

- an update on the planned commencement of sediment removal works in the Lower Vasse River in coming months;
- an update on the management of the Vasse Estuary Storm Surge Barrier;
- a briefing on the recent intrusion of salt water from the Vasse Estuary into the Lower Vasse River, and plans to manage that issue;
- a briefing on plans to remove sediment either side of the Vasse Diversion Drain Penstock;
- an update on progress to fill the vacant community member position on the LVRMAG; and
- discussions about the water quality monitoring regime, and Mexican waterlily management.

Brief summaries of key points related to each of these matters are provided below.

2.0 Sediment removal

The stage 1 sediment removal contract was awarded to Apex Envirocare, and it is expected that works will commence in March or April 2022. The stage 1 area is from the Butter Factory to the Causeway Bridge.

There are a number of reasons why sediment removal is planned to be undertaken in stages, including the fact that the availability of suitable contractors is limited – and even if sufficient funds had been available and all environmental approvals secured, it would not have been possible to do a larger sediment removal project this financial year. That is because only one potential contractor submitted a tender, and that contractor had pre-existing commitments which meant they were not able to do any further sediment removal work for the City this financial year. Because of spawning and brooding periods for Carter's freshwater mussels in July/August and October/November respectively, environmental regulators have required that sediment removal not occur during those months.

The City has, however, secured environmental approvals for sediment removal in the section of the River from the Butter Factory all the way to the Busselton Bypass, including Federal Government approval under the Federal Environmental Protection and Biodiversity Act 1999. In parallel with implementation of stage 1, planning for further stages is progressing.

3.0 Vasse Estuary Storm Surge Barrier management

The Vasse Estuary Storm Surge Barrier at Wonnerup is critical infrastructure for protecting the Busselton townsite from coastal flooding risk. There are also a range of other, often competing, issues that need to be considered when making decisions about the management of the Surge Barrier –

- Maintaining water at levels low enough to provide suitable feeding areas for migratory waterbirds, noting that the Vasse Estuary is a key part of the internationally-recognised and important migratory waterbird habitat in the broader Vasse-Wonnerup Wetlands System;



- Mitigating the risk of saltwater intrusion into the Lower Vasse River, which contains habitat for the critically endangered Carter's freshwater mussel, which has a very low tolerance for salinity – noting that saltwater intrusion last summer resulted in a significant Mussel die-off;
- Maintaining water quality in the Vasse Estuary Channel to mitigate risks of fish kill events in the Channel; and
- Reducing the exposure to the air of sediments that have accreted in the portion of the Channel near Estuary View Drive in Wonnerup, and which creates significant odour problems for nearby residents in summer.

Management decisions for the Surge Barrier are a matter for the Vasse Wonnerup Wetlands Partnership. The Partnership is led by the Department of Water and Environmental Regulation. Other members are the Department of Biodiversity, Conservation and Attractions, Department of Primary Industries and Regional Development, Water Corporation and City of Busselton. The Department of Biodiversity, Conservation and Attractions also has a key regulatory role.

The Partnership has recently had to obtain approval from the Department of Biodiversity, Conservation and Attractions for a management approach which would see summer water levels on average at a slightly higher level than was common prior to 2014, but slightly lower than in more recent summers. That change reflected concerns that the higher levels in previous years had negatively impacted waterbird habitat and, due to the erosion of a natural barrier separating the estuary from the Lower Vasse River, had contributed to the salt water intrusion into the Lower Vasse River last summer.

There have been more significant odour issues for Estuary View Drive residents this summer, relative to recent summers. For the last two years the water levels have been increased slightly at the end of summer to cover sediments at Estuary Drive to improve odour issues. With the change in management approach the ability to increase water levels is now restricted. The Department of Water and Environmental Regulation is planning a sediment removal project this winter, which would reduce the height of the sediment to mitigate the risk of it being exposed to the air, and thereby reducing odour impacts on nearby residents.

4.0 Salt water intrusion into the Lower Vasse River

The salt water intrusion into the Lower Vasse River last summer resulted from relatively high water levels in the Vasse Estuary, coupled with the erosion of some natural barriers that have historically separated the River and Estuary during summer. Despite the slightly lower levels maintained in the Vasse Estuary Channel this summer, strong and persistent easterly winds in late January and early February resulted in an increase in water levels at the western end of the Estuary, adjacent to the River, by up to 20 centimetres. That resulted in the River and Estuary being reconnected, and the movement of saline water into the River.

Because of the installation of additional real-time monitoring infrastructure over the last year, the issue was identified relatively early, although not early enough to prevent some salt water reaching the River. At this stage it is hoped that there will not be significant impacts on Carter's freshwater mussels. With the guidance and support of the Vasse Wonnerup Wetlands Partnership, the City of Busselton and Water Corporation have constructed a temporary sand bund to separate the Estuary and the River, and mitigate the risk of further salt water intrusion this year. The potential need for a similar temporary strategy next summer and/or a more permanent mitigation strategy in the future will also be considered by the City and other stakeholders during the course of 2022 and beyond.



5.0 Closing of Vasse Diversion Drain penstock and sediment removal

Over the next couple of months, Water Corporation will be undertaking some work in the main channel of the Lower Vasse River in its upper end, just downstream of the new penstocks. This will involve the removal of sediment in the main channel of the River, from the base structure at the outlet of the penstocks for approximately 200m downstream. The accumulation of sediment in this section of the river means that the culverts do not operate at 100% efficiency, and it makes flow measurement difficult due to back-flooding at lower flow rates. In order to undertake these works, the penstocks will be closed from next week, so that heavy machinery can access this section of the river. Once the clearing of the sediment in the main-channel is complete, the culverts will be opened again at full capacity.

6.0 Community member vacancy

Advertising to seek expressions-of-interest to fill the vacant community member position commenced 13 January and closed 18 February. Consideration of any expressions-of-interest received will occur in coming weeks.

7.0 Water quality monitoring and Mexican waterlily management

The Department of Water and Environmental Regulations undertakes fortnightly phytoplankton monitoring in the Lower Vasse River at the pedestrian bridge on Peel Terrace, downstream from the Strelly Street Bridge and at the Busselton Bypass Bridge. A community member of the LVRMAG raised the issue that there had been a recent deterioration of water quality upstream from the Strelly Street Bridge, and it was requested that the Department of Water and Environmental Regulations review whether the Strelly Street monitoring site should be relocated.

There was also some discussion about Mexican waterlily management. The City has undertaken strategic control of Mexican waterlily in the river in most recent years. This allows for the maintenance of areas of open water, while minimising adverse impacts and to some degree mitigating algal blooms in these areas. The use of chemicals to control the lilies is preferred over mechanical harvesting by machinery due to the high rates of regrowth following removal with mechanical harvesting. Extensive monitoring undertaken in 2018/19 demonstrated no decrease in oxygen levels as a result of the spraying which could have presented a risk to aquatic organism.

Concerns were recently raised by members of the community that the use of chemicals to spray the Mexican waterlily could have resulted in the death of Carter's Freshwater Mussels last year. The Mexican waterlilies were not sprayed in 2021, due to an early start to winter rains and resulting die-off of the plants, ongoing monitoring will continue to ensure there are no detrimental impacts to aquatic fauna.

8.0 Access to further information

Group members and members of the public can also find information relating to the River and its management on the City and Revitalising Geographe Waterways websites, via the following links –

- Wetlands and Waterways » City of Busselton
- Lower Vasse River - RGW (dwer.wa.gov.au)

These links may also be useful -



- Sediment removal FAQs available at [lower-vasse-river-sediment-removal-faqs \(busselton.wa.gov.au\)](https://www.busselton.wa.gov.au/lower-vasse-river-sediment-removal-faqs)
- Living Streams [FAQs](#) | [Waterway Management](#) | [Your Say Busselton](#)
- LVR FAQs available at [FAQs-Lower Vasses River-RGW \(dwer.wa.gov.au\)](https://www.dwer.wa.gov.au/faqs-lower-vasses-river-rgw)

Members of the community can also contact the City if they have questions about the management of the River.

18. MOTIONS OF WHICH PREVIOUS NOTICE HAS BEEN GIVEN

Nil

19. URGENT BUSINESS

20. CONFIDENTIAL MATTERS

Nil

21. CLOSURE