2 October 2020

NOTICE OF MEETING

Dear Councillor,

The next Ordinary Meeting of Council will be held in the Council Chamber at 6.30pm on Tuesday, 13 October 2020.

The attached agenda is presented for your consideration.

Yours sincerely

Shane Purdy
ACTING CHIEF EXECUTIVE OFFICER

PLEASE NOTE:

There is limited capacity for members of the public to attend this meeting due to the COVID-19 public health emergency. Physical distancing restrictions will apply. Restricted viewing will be available from the Civic Area adjacent to the Council Chamber. The Civic Area is restricted to a maximum number of 48 members of the public.

Public Question Time and Deputations will be able to be made to Council from the Civic Area.

AGENDA
ORDINARY COUNCIL MEETING
13 OCTOBER 2020

ATTENTION/DISCLAIMER

The purpose of this Council Meeting is to discuss and, where possible, make resolutions about items appearing on the agenda. Whilst Council has the power to resolve such items and may in fact appear to have done so at the meeting, no person should rely on or act on the basis of such decision or on any advice or information provided by an Elected Member or employee, or on the content of any discussion occurring during the course of the Meeting. Persons should be aware that regulation 10 of the *Local Government (Administration) Regulations 1996* establishes procedures to revoke or change a Council decision. No person should rely on the decisions made by Council until formal written advice of the Council decision is received by that person.

The Shire of Mundaring expressly disclaims liability for any loss or damage suffered by any person as a result of relying on or acting on the basis of any resolution of Council, or any advice or information provided by an Elected Member or employee, or the content of any discussion occurring during the course of the Council Meeting.

CONTENTS

1.0 OPENING PROCEDURES

Acknowledgement of Country

Shire of Mundaring respectfully acknowledges the Whadjuk people of the Noongar Nation, who are the traditional custodians of this land. We acknowledge Elders past, present and emerging and respect their continuing culture and the contribution they make to the region.

Recording of Meeting

Members of Council and members of the gallery are advised that this meeting will be livestreamed and audio-recorded.

1.1 Record of Attendance

Elected Members

Apologies

Leave of Absence Nil

Absent

Staff

Guests Nil

Members of the Press

2.0 ANNOUNCEMENTS BY PRESIDING MEMBER WITHOUT DISCUSSION

3.0 DECLARATION OF INTEREST

3.1 Declaration of Financial Interest and Proximity Interests

Elected Members must disclose the nature of their interest in matters to be discussed at the meeting *(Part 5 Division 6 of the Local Government Act 1995).*

Employees must disclose the nature of their interest in reports or advice when giving the report or advice to the meeting *(Sections 5.70 and 5.71 of the Local Government Act 1995).*

3.2 Declaration of Interest Affecting Impartiality

An Elected Member or an employee who has an interest in a matter to be discussed at the meeting must disclose that interest *(Shire of Mundaring Code of Conduct, Local Government (Admin) Reg. 34C).*

4.0 RESPONSE TO PREVIOUS PUBLIC QUESTIONS TAKEN ON NOTICE

Nil

5.0 PUBLIC QUESTION TIME

15 minutes (with a possible extension of two extra 15 minute periods) are set aside at the beginning of each Council meeting to allow members of the public to ask questions of Council.

Public Question Time is to be conducted in accordance with Shire of Mundaring Meeting Procedures Local Law 2015.

6.0 APPLICATIONS FOR LEAVE OF ABSENCE

7.0 CONFIRMATION OF MINUTES OF PREVIOUS MEETINGS

RECOMMENDATION

That the Minutes of the Ordinary Council Meeting held 8 September 2020 be confirmed.

8.0 PRESENTATIONS

8.1 Deputations

(1) Members of the public may, during the deputations segment of the order of business and with the consent of the Presiding Member, make a public statement on any matter that appears on the agenda for that meeting provided that –
   a) the deputation is limited to a maximum of 3 minutes, unless otherwise determined by the Presiding member;
   b) the deputation is not offensive or defamatory in nature, providing that the Presiding Member has taken all reasonable steps to assist the member of the public to phrase the statement in a manner that is not offensive or defamatory; and
   c) no discussion or questions relating to the deputation are permitted, unless otherwise determined by the Presiding Member.

(2) Fifteen minutes is to be allocated for deputations.

(3) Once all statements have been made, nothing prevents the unused part of the deputation time period from being used for other matters.

(4) If the 15 minute period set aside for deputations is reached, Council may resolve by resolution that statement time be extended for no more than two 15 minute extensions.

8.2 Petitions

(1) A petition is to –
   a) be addressed to the President;
   b) be made by electors of the district;
   c) state the request on each page of the petition;
   d) contain the legible names, addresses and signatures of the electors making the request;
   e) contain a summary of the reasons for the request;
   f) state the name of the person to whom, and an address at which, notice to the petitioners can be given; and
   g) not contain offensive or insulting language.

(2) On the presentation of a petition –
   a) the member presenting it or the CEO is confined to reading the petition; and
   b) the only motion that is in order is that the petition be received and that it be referred to the CEO for action.

(3) At any meeting, the Council is not to vote on any matter that is the subject of a petition presented to that meeting, unless –
   a) The matter is the subject of a report included in the agenda; and
   b) The Council has considered the issues raised in the petition.

8.3 Presentations

9.0 REPORTS OF COMMITTEES

Nil

10.0 REPORTS OF EMPLOYEES

10.1 Review of the Shire's Local Planning Framework - Further Adjournment of Debate

File Code	PS.TPS 4.02
Author	Jonathan Throssell, Chief Executive Officer
Senior Employee	Jonathan Throssell, Chief Executive Officer
Disclosure of Any Interest	Nil
Attachments	Nil

SUMMARY

At the Ordinary meeting held on 8 September 2020 Council resolved to adjourn debate on a motion moved by Cr Collins until the Ordinary meeting of Council to be held on 13 October 2020.

Due to the need to obtain further feedback from councillors, which will assist officers in preparing advice in a subsequent report to Council, there is a need to further adjourn the debate on the motion until the ordinary meeting of Council to be held on 8 December 2020.

BACKGROUND

Council resolved to adjourn debate on a motion moved by Cr Collins which recommended that Council develop a position statement in regards to a review of the State Planning Framework – Council decision C11.09.20 refers.

Ordinarily debate on an adjourned motion resumes on the date and at the place specified in the procedural motion. However, following initial discussions with councillors at a Council Forum meeting held on 14 September 2020, it became apparent that a further discussion with councillors was required to enable officers to prepare advice about the motion prior to Council resuming debate on the motion.

STATUTORY / LEGAL IMPLICATIONS

Shire of Mundaring Meeting Procedures Local Law 2015 refers.

"9.5 Debate to be adjourned…- effect of motion

A motion "that the debate on the motion be adjourned" –

(a) is to state where in the order of business, or to which future meeting the debate is to be adjourned; and

(b) if carried, has the effect that all debate on the substantive motion or amendment ceases immediately, but continues when the presiding member reintroduces the matter at the time in the order of business stated in the motion."

POLICY IMPLICATIONS

Nil

FINANCIAL IMPLICATIONS

Nil

STRATEGIC IMPLICATIONS

Nil

RISK IMPLICATIONS

Risk: Reputation: Council decides to continue debate without further adjournment (and without officer advice); which may lead to Council determining a position statement which is factually incorrect, lacks clarity, and/or may inadvertently diminish Council's ability to effectively lobby the State as part of its planning reform.		
Likelihood	**Consequence**	**Rating**
Unlikely	Minor	Low
Action / Strategy		
Council agrees to continue adjournment of debate until officer advice can be provided in the form of a report.		

EXTERNAL CONSULTATION

N/A

COMMENT

In order to allow sufficient time for councillors to provide feedback and for officers to prepare advice and a report to Council, it is recommended that the adjournment of debate on Cr Collins' motion continue until the council meeting to be held on 8 December 2020.

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION

That debate on the following motion continue to be adjourned until the Ordinary Council meeting to be held on 8 December 2020:

"That Council:

1. *Endorses the following statement to guide our position in the coming review of the State Planning Framework (Perth to Peel @ 3.5) and our lobbying activities:*

   Acknowledges that the State Planning Framework and incorporated growth strategies for our Shire, no longer align with our community's vision, the significant bushfire risks faced by our region, nor the protection of our significant environmental, lifestyle and tourism values, which are an asset to the State.

   Future population growth within our Shire cannot meet the objectives in the State Framework for a more compact, consolidated and connected city, which builds upon existing infrastructure, reduces private vehicle use, respects its natural assets and heritage, and provides resilience to climate change, if we must continue to adopt the outdated 'dispersed growth' model, reflected in the plan for our Shire. As noted in the Framework, this model is of the late 20th Century, formulated in a time with a markedly different perspective of environmental protection, in a different climate, without the considerable bushfire risks we now face.

   Our community's vision, to be the 'Place for sustainable living', is directly aligned with the goals of the State, for a sustainable, safe and connected region, where we build on our economic strengths, environmental values and improve existing infrastructure to serve the whole community. However, the existing regional framework, does not address infrastructure issues in our District Centre Mundaring, nor celebrate our Hill's values to create a vibrant and safe place to live with strong local employment. Instead, it focus growth in greenfield sites, with huge infrastructure needs, reliance on private vehicle use, clearing of native bushland, while still placing communities at an increased risk of bushfire impacts. The State Planning Framework must be innovative and flexible to meet the needs of future generations.

   We request that during the coming review of Perth to Peel @ 3.5, the State consults with community and other stakeholders to embark on a renewed approach to planning for growth and development in the Hills. Potentially viewing the entire Perth Hills as a separate sub-region, acknowledging their value to the State as an environmental, tourism, health & wellness and agricultural asset. Most importantly, the renewed framework must consider the increasing risks to biodiversity and bushfire safety in the Perth Hills and develop a path forward which allows us to drive our Local Planning Framework to meet the objectives of Perth to Peel @3.5 Million.

2. *Requests the Shire President writes to the Minister for Planning, advising of the above decisions and Council's position on the coming review of Perth to Peel @3.5 Million."*

10.2 Structure Plan 78 - Various Lots - Tunnel Road and Viveash Road, Swan View

File Code	PS.TPS 4.3.078
Author	Marielle Bradfield, Planning Officer
Senior Employee	Mark Luzi, Director Statutory Services
Disclosure of Any Interest	Nil
Attachments	1. Structure Plan ⇩ 2. Structure Plan Report ⇩ 3. Subdivision Concept Plan ⇩ 4. Schedule of Submissions ⇩ 5. Confidential Submitter Info (confidential) 6. Bushfire Management Plan ⇩ 7. Flora and Fauna Habitat Survey ⇩ 8. Site and Soil Evaluation ⇩ 9. Ownership Plan ⇩

Landowners	Lot 350 Viveash Road – Kyal Liam Gatti & Jarrad Elvidge David Gatti Lot 351 Viveash Road – Brian Wayne Buttsworth & Lesley Jaye Buttsworth Lot 4 Viveash Road – Cyril Branson & Esther Marie Branson Lot 29 Viveash Road – Giuseppe Velletri & Angela Marina Velletri Lot 30 Viveash Road – Adam Stewart Dobson & Katherine Ann Dobson Lot 27 Viveash Road – Rosa Canosa Lot 23 Tunnel Road – Edward Stephen Hart Lot 103 Tunnel Road – Christine Lily Snell
Applicant	Statewest Planning
Zoning	Urban (MRS).; Residential R2.5 and Residential R5 (LPS 4)
Area	8.9207 hectares
Use Class	N/A

SUMMARY

Council is required to make a recommendation to the Western Australian Planning Commission (WAPC) on Structure Plan 78 (SP78).

SP78 covers various lots in the vicinity of Tunnel and Viveash Roads in Swan View. It makes provision for the subdivision of eight lots into a total of 23 lots. These properties have existing subdivision potential and are zoned Urban under the Metropolitan Region Scheme (MRS) and zoned Residential R2.5 and Residential R5 under Local Planning Scheme No. 4 (LPS4).

SP78 has been advertised and assessed. In accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Regulations), the Shire is now required to make a recommendation to the Western Australian Planning Commission (WAPC).

After assessing SP78 against the relevant parts of the planning framework and in light of the various submissions received, Council is requested to recommend to the WAPC that it supports SP78, subject to modifications.

BACKGROUND

Previous Approvals/Subdivisions:

Under the Shire's previous local planning scheme, Town Planning Scheme No. 3 (TPS3), there was an adopted Local Subdivision and Infrastructure Plan (LSIP 134) over the area and all lots were zoned Residential R2.5.

Through the adoption of Shire's current scheme, Local Planning Scheme 4 (LPS4), the western portion of the LSP area was rezoned to a higher density coding of R5. LSIP 134 became obsolete and was rescinded.

In April 2015, subdivision of the lot on the corner of Viveash Road and Tunnel Road was approved without a Structure Plan, creating Lot 22 (not included in SP78) and Lot 23 Tunnel Road.

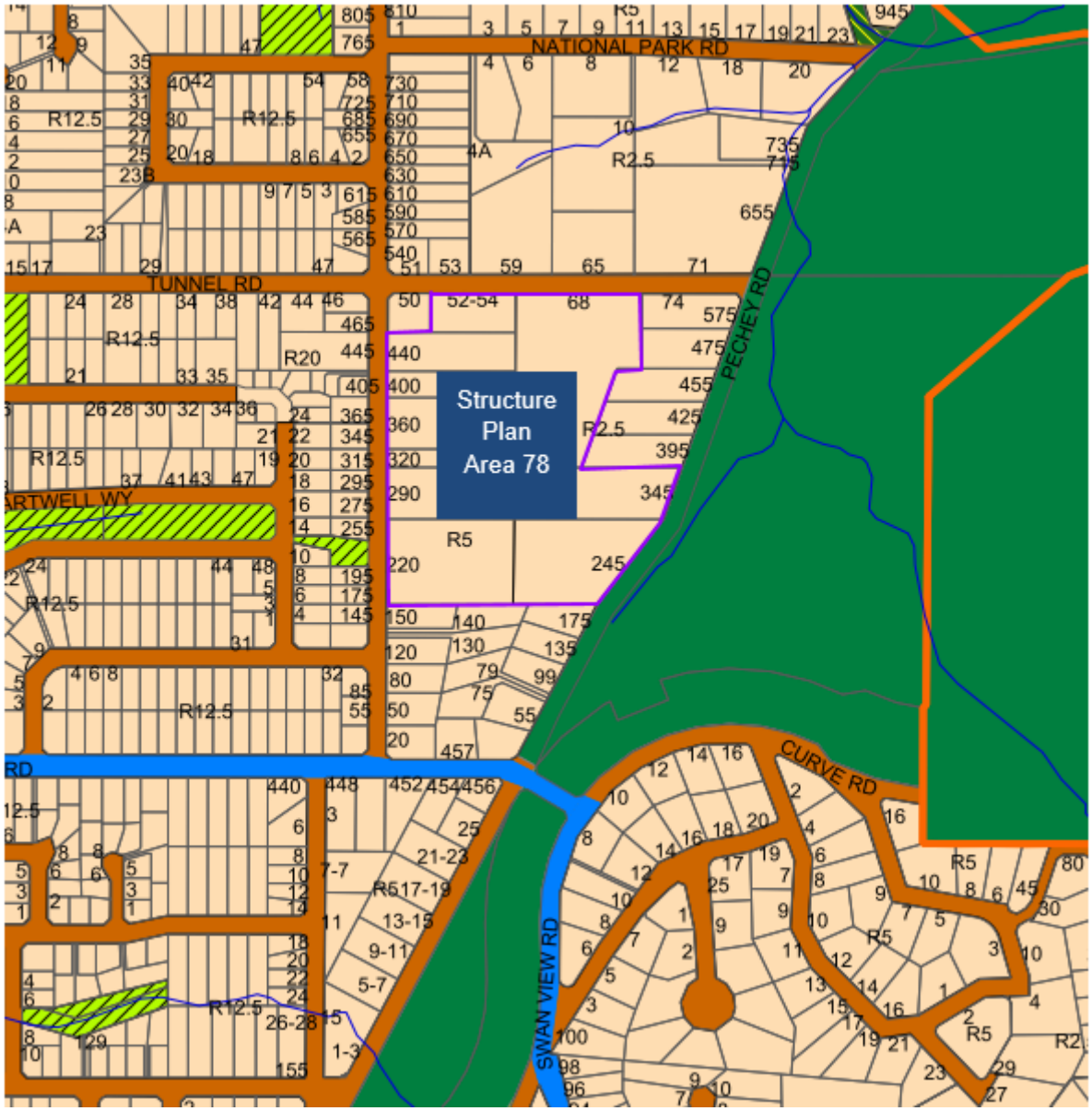
Later that same year the proposed subdivision of Lot 29 was refused due to (?) the absence of a Structure Plan.

Description of area and proposal:

The total area covered by SP78 consists of 8.9207ha, located at the eastern edge of the Swan View locality. The area is bounded by Tunnel Road to the north, Viveash Road to the west and Pechey Road to the east.

To the north of the site consists of R2.5 to R5 density residential development, to the west R12.5 densities, and to the south R5 densities. To the east of the site adjoining Pechey Road lies John Forrest National Park.

Figure 1: Structure Plan area and surrounding land densities / uses



The subject properties involve eight privately owned lots (blue outline above) ranging in area from 2,835sqm to 2.504ha.

Topographically the structure plan area is divided by a ridgeline that runs north to south. To the west of this ridgeline lots are zoned Residential R5 (i.e. 2,000sqm lots), and to the east lots zoned Residential R2.5 (i.e. 4,000sqm lots).

Properties within the structure plan have been developed for residential purposes, with single houses, outbuildings and developed gardens. Pockets of native vegetation identified as ‘good’ to ‘very good’ exist east of the ridgeline across the R2.5 lots.

Figure 2: Aerial view of Structure Plan area

The purpose of the structure plan is to provide for the basis of subdivision of the land, identifying the road layout and contribution towards Public Open Space (POS), and ensuring individual subdivisions do not prejudice the coordinated development of the Structure Plan area. Structure Plans are not required to resolve all potential issues that may arise at subdivision / development stage.

The structure plan area is relatively small with limited infill potential across the lots. Due to various site constraints, such as topography and existing development across the lots, SP78 proposes a short internal road (cul-de-sac) approximately 148m long, and battleaxe subdivision across individual lots with access to existing roads.

Further comment regarding how this design outcome was reached is discussed under the “Bushfire” and Lot Configuration section of this report.

POS is proposed as cash-in-lieu (equivalent to 10% of the SP land area).

Staging is proposed with Stage One consisting of the subdivision of Lots 350 and 351 with the cul-de-sac. The remaining lots can be subdivided independently.

STATUTORY / LEGAL IMPLICATIONS

MRS Zoning

The subject properties are zoned Urban under the MRS.

Urban zones are:

Areas in which a range of activities undertaken, including residential, commercial, recreational and light industry.

LPS4 Zoning

The subject properties are zoned 'Residential R5' and 'Residential R2.5' densities under LPS4.

The Residential zoning aligns with the Urban zoning under the MRS.

The Regulations:

Schedule 2 (Deemed provisions for local planning schemes) of the Regulations outline the provision for when a structure plan may be prepared, including their content and method of advertising for public comment.

The WAPC remains the determining authority for structure plans. In accordance with the Regulations, the Shire is required to provide a report to the WAPC, which includes:

- a list of submissions and any comments by the Shire in respect of those submissions;
- an assessment of the proposal based on appropriate planning principles; and
- a recommendation on whether the proposed structure plan should be approved by the WAPC, including any modifications.

The Regulations require the Shire provide a recommendation to the WAPC within 60 days from the conclusion of advertising.

SP78 has been prepared and advertised in accordance with these provisions.

POLICY IMPLICATIONS

Shire of Mundaring

PS-01 – Advertising Planning Applications

SP78 has been advertised in accordance with this policy.

PS-08 – Street Trees

The purpose of the Shire's Street Trees Policy is:

"1. To increase the tree canopy cover within the Shire's road reserves and mitigate the urban heat island effect, support biodiversity and enhance the character and amenity of local streets; and

2. To outline the Shire's expectations in relation to proposals requiring or impacting upon street trees within Shire managed road reserves."

Policy measure 3.1 requires that new roads are a minimum of 16m in width, to provide sufficient space within the verge for street trees on both sides of the street. SP78 complies with this requirement with a 16m wide road reserve proposed and a minimum 17.5m wide cul-de-sac head.

Policy measure 3.3 requires structure plans to be designed to maximise opportunities to retain existing trees as future street trees and incorporate new street tree planting.

The alignment of the proposed cul-de-sac and lot boundaries has been designed to retain any habitat trees identified along the road reserve. Additional street trees will be required to be planted along the cul-de-sac, and the 16m road reserve width would allow for this.

Subdivision of lots with existing road frontage would potentially require additional street trees, depending on the vegetation that is retained within the verge and any upgrade works that may be required to the road.

Western Australian Planning Commission

State Planning Policy 3.7 (SPP3.7) – Planning in Bushfire Prone Areas

SP78 falls within a mapped bushfire prone area and therefore subject to SPP 3.7. This report details how the structure plan demonstrates compliance with SPP3.7 and the *Guidelines for Planning in Bushfire Prone Areas* (refer to "Bushfire" section).

State Planning Policy 7.3 (SPP 7.3) – Residential Design Codes (R Codes)

The land within SP78 is zoned 'Residential' and therefore subject to the R Codes. The lots are zoned R2.5 and R5, and the subdivision concept plan reflects these zonings and minimum site area requirements. Some lots are constrained due to their configuration, insufficient land area, road access, land form and topography, limiting subdivision potential of these lots. Refer to comments under "Lot Configuration" and "Bushfire".

Department of Health, Department of Planning Lands and Heritage, Department of Water and Environment Regulation

Government Sewerage Policy (GSP)

The GSP came into effect in 2019, and requires the provision of reticulated sewerage to all new lots where possible.

Where reticulated sewerage is not available, which is the case for the land area within SP78, the proponent shall demonstrate the capability of the site to accommodate on site effluent disposal. This is discussed in further detail under "Effluent Disposal" section of this report.

FINANCIAL IMPLICATIONS

Nil

STRATEGIC IMPLICATIONS

Mundaring Strategic Community Plan 2020 - 2030

Priority 3 - Built environment

Objective 3.3 – Regulated land use and building control to meet the current and future needs of the community

Strategy 3.3.3 – Promote sustainability in design and development for buildings

Local Planning Strategy

The Shire's Local Planning Strategy sets out the long term planning directions for the Shire to guide land use over the next 10 to 15 years. The Strategy provides the rationale for the provisions and zoning of LPS 4.

Section 5.2.2 of the Strategy recommends residential infill in the Swan View locality "*in close proximity to Local Centres and schools, where reticulated sewerage can be provided and which have good access to public transport, employment and other facilities, and with good opportunities for redevelopment…"*

The strategy also provides for the upcoding from Residential R2.5 to R5 to lots on the western side of SP78 off Viveash Road. This has been reflected under the current zoning within LPS 4.

Reticulated sewage is available to the western side of the structure plan area, with Lot 351 connected to the sewer. Extension of the sewer to the proposed lots within the structure plan area was investigated extensively by the proponents in consultation with an engineer and the Water Corporation. It was concluded that the site cannot connect to the reticulated sewer network and on-site effluent disposal is required.

It is considered that SP 78 reflects the recommendations of the Strategy.

SUSTAINABILITY IMPLICATIONS

SP78 presents a measured response to providing some residential infill within an existing residential zoned area, with lower densities (R5-R2.5) that respond to its location on the periphery of urban front, at the foot of the Darling Scarp.

The key sustainability implications are bushfire mitigation, which includes feasible and compliant access arrangements, balanced with the preservation of pockets of onsite vegetation.

On-site water management and effluent disposal arrangements, particularly for lots within 100m of the nearby waterway within John Forrest National Park, is another environmental consideration.

This report outlines how SP78 will respond to these sustainability implications.

RISK IMPLICATIONS

Risk: Compliance A structure plan is required to be prepared and determined under LPS 4 and the Regulations. Not determining the structure plan would create a short term non-compliance, the consequence of which would likely be determination of SP78 without the WAPC's consideration of the Shire's recommendations.		
Likelihood	**Consequence**	**Rating**
Unlikely	Minor	Low
Action / Strategy		
The Council makes a determination on SP78 having regard to the recommendations of this report.		

EXTERNAL CONSULTATION

SP78 was advertised to 34 landowners within and surrounding the proposed LSP area. The proposal was advertised in the Echo newspaper and a sign was placed on the corner of Tunnel Road and Viveash Road. The structure plan was also referred to the Swan View Ratepayers Association.

The Shire received 11 submissions from the public. Two support the proposal, seven object to the proposal and a further two queried elements of SP78 e.g. fencing and absence of subdivision shown across three lots within SP78.

The objections predominantly relate to:

- Higher crime rate;
- Additional traffic /speeding;
- Dwelling density / loss of hills amenity;
- Environmental impacts to wildlife and vegetation; and
- Noise

The structure plan was also advertised to 13 agencies, of which six submissions were received.

Responses to the submissions are provided within the schedule of submissions (refer to **Attachment 4**) and the 'Comment' section of this report.

COMMENT

SP78 Summary

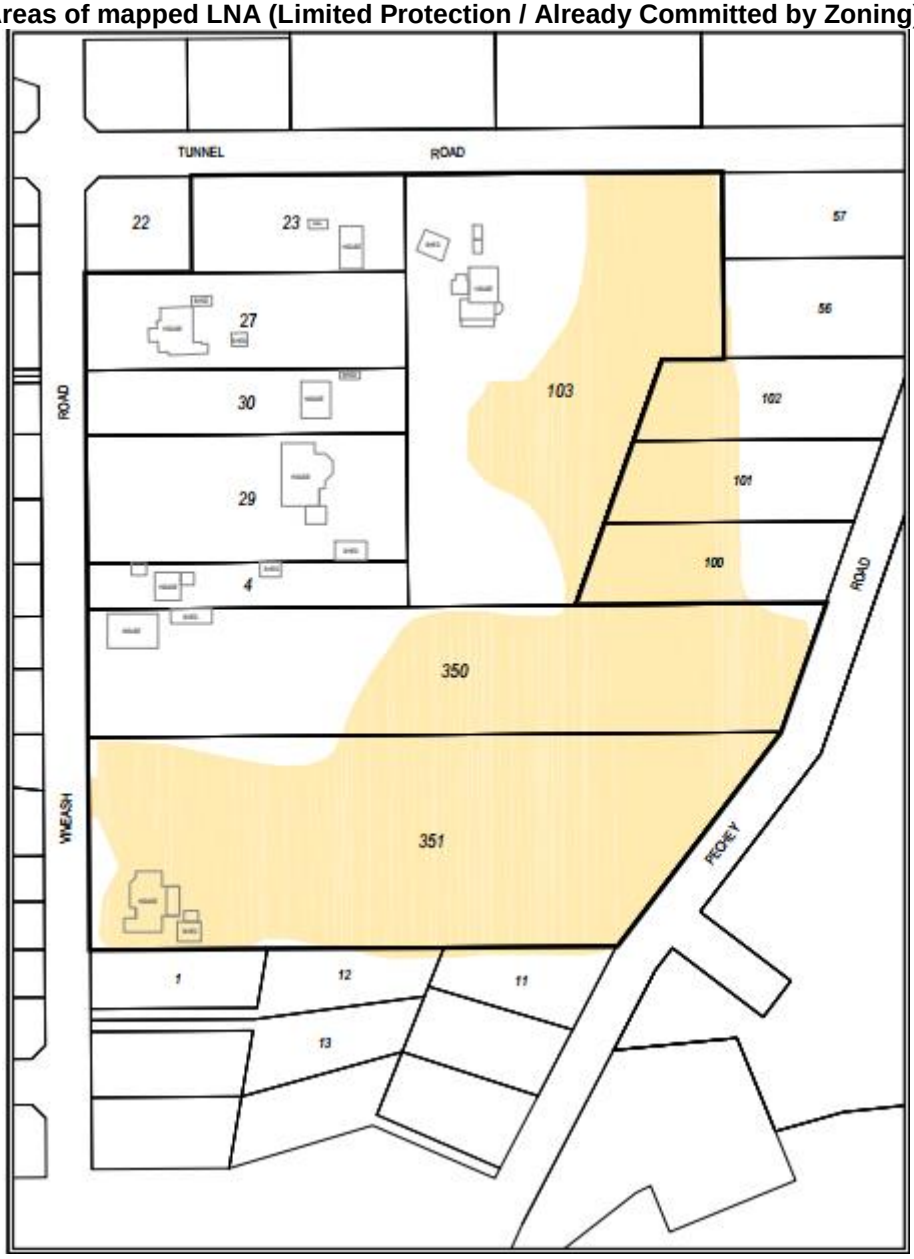
Item	Data
Total area	8.9207 hectares
Number of parent lots	8
Number of proposed lots	23 (total increase of 15 lots)
Population	Approximately 58 persons (increase would be approximately 38 persons from existing population)

Densities	R2.5 (4,000sqm lots) and R5 (2,000sqm lots)
Public Open Space	Cash in lieu @ 10% (0.8921 ha)

Vegetation Protection

The Shire's Local Biodiversity Strategy has identified a portion of the site as Local Natural Area (LNA), but with "Limited Protection / Already Committed by Zoning", which recognises this area has been zoned for residential development, and that some vegetation removal is anticipated.

Figure 3: Existing Lot Layout-
Areas of mapped LNA (Limited Protection / Already Committed by Zoning).



Large portions of the LSP area have been cleared to accommodate existing residential development, with existing single houses, outbuildings and domestic gardens.

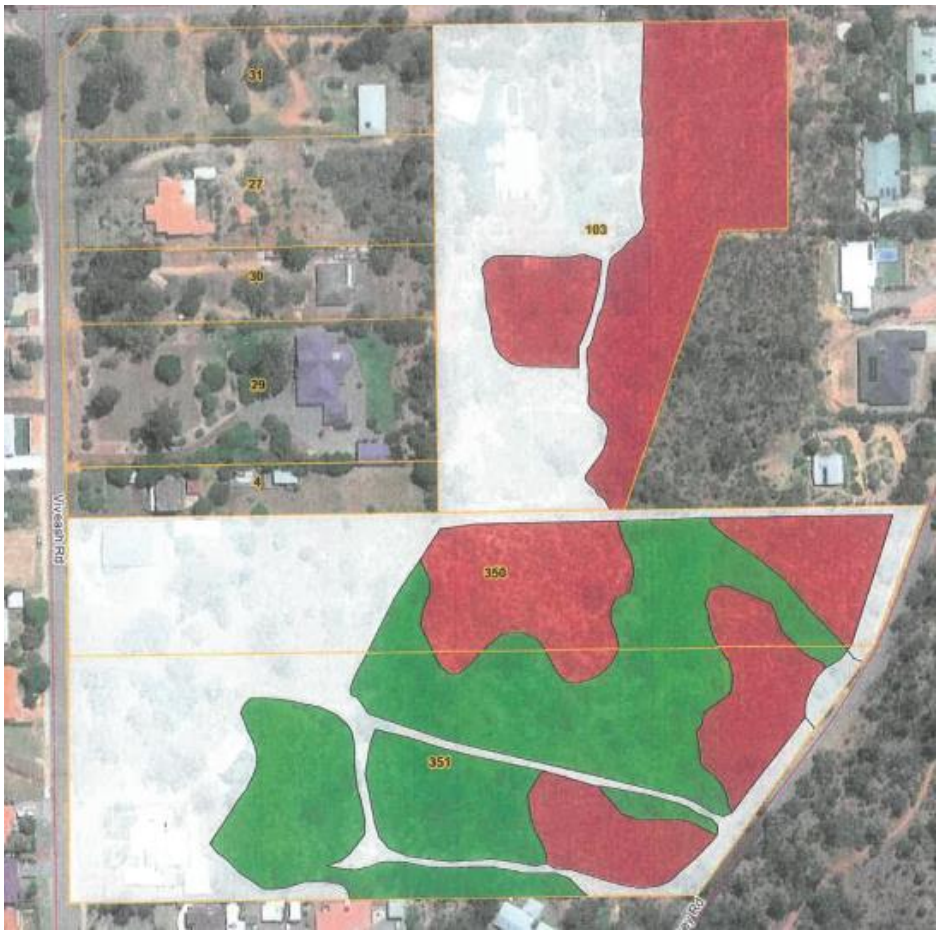
Some pockets of remnant vegetation and regrowth are present across Lot 103 Tunnel Road and Lots 350 and 351 Viveash Road, which are the three largest lots of SP78. The areas of mapped LNA fall within these lots.

A flora and fauna assessment was undertaken by Terratree Pty Ltd across these three lots, known as the 'survey area'. The survey area did not include Lots 4, 29, 30, 27 Viveash Road and Lot 23 Tunnel Road, which are predominantly developed for residential purposes and have no mapped LNA.

The findings of the assessment found that a large portion of the survey area (77.24%) was rated as Degraded or Completely Degraded. There was no Priority or Threatened Ecological communities present on site and the area was densely infested with weed species.

The assessment found no Threatened (Declared Rare) Flora. One Priority species, *Beaufortia purpurea*, was identified within the survey area (throughout Vegetation Type 1). *Beaufortia purpurea* is found on rocky slopes or granitic soils. As a Priority 3 species it is not protected under the *Biodiversity Conservation Act (WA) 2016*. To ensure large populations of the Priority flora remain intact, the *Beaufortia purpurea* should be demarcated prior to ground disturbing works, and retained where possible.

Figure 4: Vegetation Type 1 (Red) – Areas where *Beaufortia purpurea* present

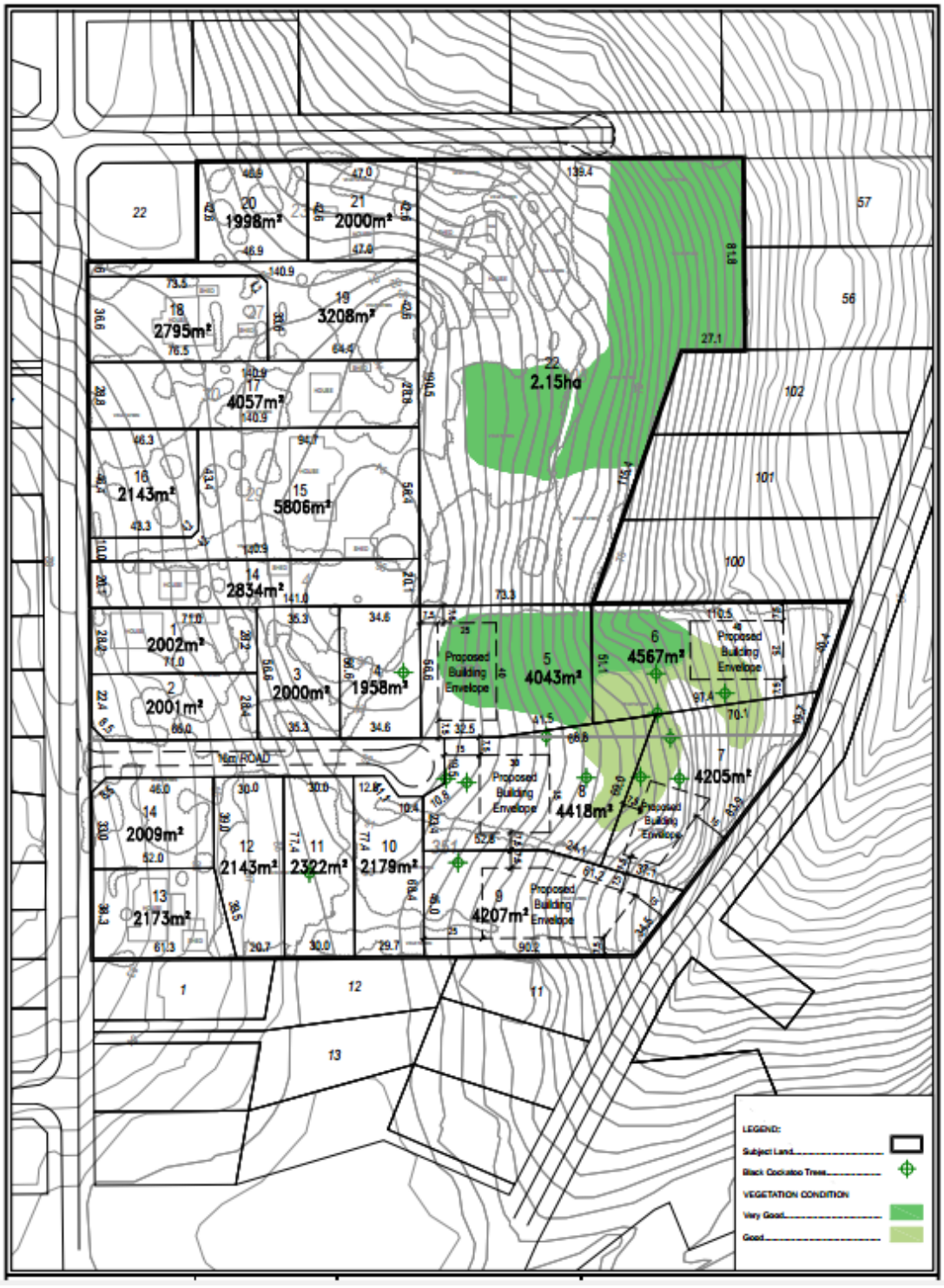


The assessment also identified 13 potential black cockatoo habitat trees within the survey area. Two additional habitat trees have been identified within the LSP area by the Shire's Environmental Services team. These trees have been included in the habitat tree mapping for the site.

Pockets of vegetation east of the ridgeline across the R2.5 lots have been identified as ‘good’ to ‘very good’. SP78 proposes the location of building envelopes on these lots to allow for the retention of identified habitat trees, and to minimise disturbance to vegetation classified as ‘good’ to ‘very good’.

The alignment of the proposed new road reserve and new lot boundaries has been carefully designed to enable the retention of habitat and significant trees on site.

Figure 5: Subdivision Concept Plan - Areas of vegetation classified as ‘Good” to ‘Very Good’ and Building Envelopes



It is recommended that the following additional detail be provided and approved by the WAPC, prior to the WAPC supporting subdivision of relevant properties:

- Location of building envelopes for R2.5 lots to minimise disturbance to vegetation classified as ‘good’ to ‘very good;
- Lots 4,27, 29, 30 Viveash Road and Lot 23 Tunnel Road requiring a habitat tree survey;
- Identification and protection of significant populations of the Priority species *Beaufortia purpurea* within areas of vegetation classified as ‘good’ to ‘very good’, to ensure priority flora is not unduly impacted by subdivisional works.
- Significant tree retention/removal plan to maximise retention of habitat and other significant trees (i.e. grass trees) on site; and
- A Dieback Management Plan to identify appropriate management practices for preventing the spread of Phytophthora dieback, ensuring all machinery, particularly earth moving equipment is clean (i.e. free of soil and vegetative materials) on entry to the site.

Lot configuration / road layout:

The subdivision concept plan is shown above in Figure 5 (and Attachment 3) will provide a lot yield of 23 lots.

If approved by the WAPC, future subdivision proposals are to be generally consistent with the approved structure plan.

A series of design options were explored as part of the preparation of SP78.

A road extending northwards from the end of the proposed cul-de-sac to connect to Tunnel Road was considered. The alignment of the road would have been located to the rear of lots 4, 29, 30, 27, 23 Viveash Road and along the western boundary of Lot 103 Tunnel Road. Road frontage to new lots created through the subdivision of these properties would have been provided as a result of its construction.

Due to the topography, terrain and location of existing development, the construction of a 16m wide road reserve through this section of the site would be difficult to achieve, and would exceed acceptable road gradients. The slope of the road at its northern connection to Tunnel Road would be at least 14%, which exceeds the maximum 10% gradient for public roads as set out in the *Guidelines for Planning in Bushfire Prone Areas* (bushfire guidelines). Further, additional lots would be required to incentivise the construction of the road which would require additional removal of onsite vegetation, and would push residential development further east into pockets of vegetation classified as “very good” on Lot 103.

A road aligned to the top of the ridge would create very limited benefit in terms of providing alternative access / egress routes in an emergency, as it would simply loop back to Viveash road to the west. Battleaxe lot designs have therefore been recommended over Lots 27 and 29 with access onto Viveash Road.

Figure 6: Road access options and viability

The eastern section of Tunnel Road reserve which connects to Pechey Road has gradients in excess of 17%. The construction of the remainder of Tunnel Road is therefore unviable as road gradients would be too steep and non-compliant with the bushfire guidelines.

A road connection from Viveash Road to Pechey Road across Lots 350 and 351 was also unviable due to the slope of the eastern portion of these lots (i.e. 16% -30% gradients). A cul-de-sac road design over the western portion of these lots was the only viable option to provide compliant road access to new lots that do not have direct frontage to Pechey Road.

A number of subdivision options were explored for Lot 103. This lot is relatively large at 2.15ha in area, which equates to five additional lots under the R2.5 zoning.

The main limiting factor to subdivision of this site was the inability to provide public road frontage to the new lots due to the topography of the site and the existing vegetation.

As mentioned above, compliant road access could not be achieved, either as a road from the cul-de-sac connecting to Tunnel Road to the north, or via the construction of the remainder of Tunnel Road east to connect to Pechey Road. To achieve acceptable BAL ratings on lots created from Lot 103, large areas of vegetation classified as “very good” would require removal given the slope of the site slope towards its eastern side... Given these constraints, Lot 103 remains unaltered on the concept plan, with no subdivision shown across the lot.

Lot 4 does not have sufficient land area for further subdivision, therefore this lot remains unaltered on the concept plan.

Lot 30, for reasons stipulated within the structure plan report, could not achieve a compliant battleaxe lot design in accordance with the R Codes. This is due to a reduced lot frontage and a battleaxe leg that would require more than 20% of the total site area. The battleaxe leg would need to be a minimum 6m wide to now comply with the bushfire requirements. As such, this lot remains unaltered on the concept plan, with no subdivision shown.

Public Open space (POS)

The structure plan area is well serviced by pocket parks, local reserves and the John Forrest National Park directly to the east.

Figure 7: Public Open Space within SP78 locality

The Shire's POS Strategy identifies the structure plan site as providing POS in the form of cash-in-lieu for the upgrading of the nearby heritage trail which passes through the John Forrest National Park.

POS would be collected as cash in lieu payment for the market value of land that is 10% of the land at the time of a subdivision application, which is consistent with the Shire's POS Strategy and the WAPC's Development Control Policy *DC2.3 Public Open Space in Residential Areas.*

Bushfire

A Bushfire Management Plan (BMP) has been prepared for the structure plan area which can be viewed in **Attachment 6**.

The table below contains assessment of SP78 against the provisions of *State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7*) and the Guidelines for Planning in Bushfire Prone Areas.

State Planning Policy 3.7 - Criteria	Comment
6.2(a) – Strategic planning proposals…within designated bushfire prone areas relating to land that has or will have… a Bushfire Attack Level (BAL) rating above BAL-LOW apply, are to comply with these policy measures.	SP78 is subject to SPP 3.7. The BAL contour map provided within the BMP shows that all proposed new lots within SP78 can achieve a BAL-29 rating or lower.
6.2 (b) Any strategic planning proposal …in area to which policy measure 6.2 (a) applies, that has or will, on completion, have a moderate BHL and/or where BAL-12.5 to BAL-29 applies, may be considered for approval where it can be undertaken in accordance with (other) policy measures.	The BMP demonstrates that SP78 will comply with all other policy measures and therefore may be considered for approval.
6.3 – Information to accompany strategic planning proposals is to include: • A BAL contour map; • Identification of any bushfire hazard issues; • Clear demonstration of compliance with the bushfire protection criteria. The BMP is to be prepared by an accredited Bushfire Planning Practitioner.	The BMP for SP78 includes all the relevant information required, and demonstrates compliance with the bushfire protection criteria for subsequent planning stages, i.e. location, siting and design, vehicular access and water. The BMP has been prepared by a suitably qualified bushfire practitioner.
6.8 Advice of the agencies responsible for emergency services to be sought	SP78 was referred to Department of Fire and Emergency Services (DFES).

	Submission No. 15 (refer to schedule of submissions) was received by DFES objecting to the proposal. Refer to the Table below which addresses their submission.
6.9 Advice of the agencies responsible for biodiversity conservation management and environmental protection to be sought where: c) strategic planning proposal abuts vegetated land managed by that authority.	SP78 was referred to the Department of Biodiversity Conservation and Attractions (DBCA) as the structure plan area is directly east of the John Forrest National Park (separated by Pechey Road). No submission was made by DBCA. SP78 was also referred to the Department of Water and Environment Regulation (DWER). Submission No. 11 was received - confirming no comment/objection to proposal.

Battleaxe Lots and Cul-de-sac design:

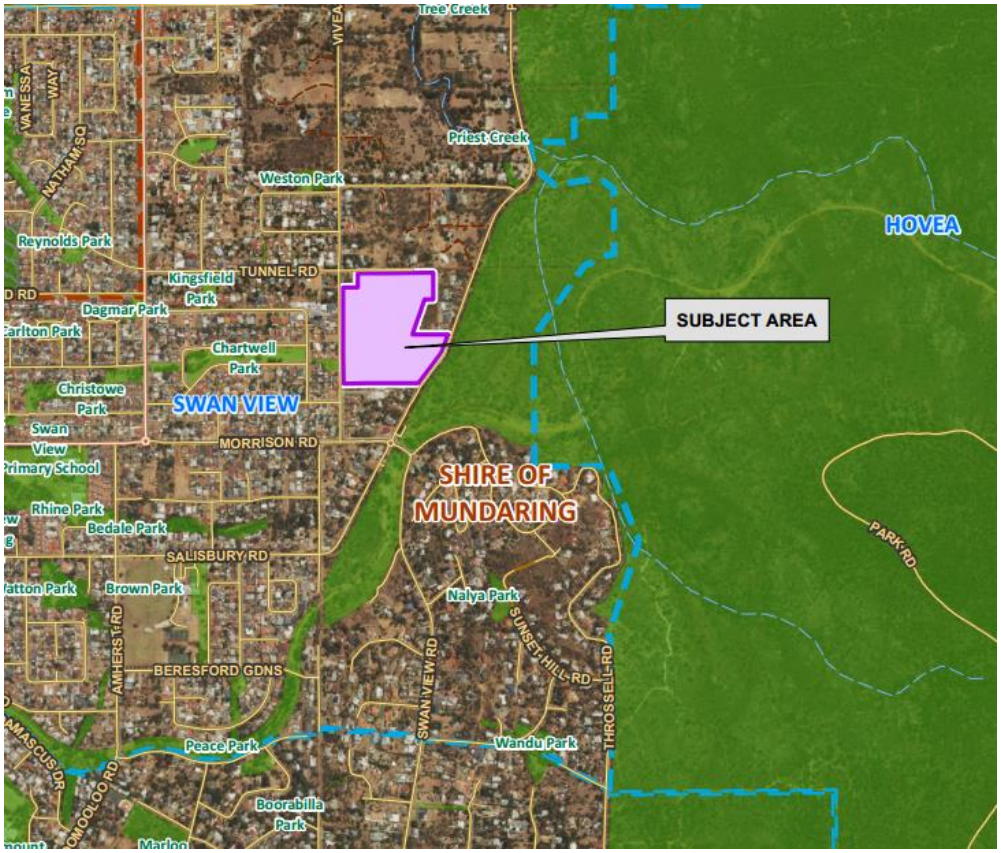
The exposure of the site to bushfire threat will be predominantly from John Forrest National Park to the east.

As detailed above under “Lot configuration / road layout”, a number of vehicular access options were explored to establish whether compliant road access could be achieved across the structure plan area.

Connecting roads from Viveash to Pechey are not achievable due to slope. A road cutting north through the mid-section of the structure plan area to Tunnel Road cul-de-sac would be non-compliant in terms of road gradients, and would provide no additional benefit in terms of creating an access route in an alternative direction.

Given these constraints, and the threat of fire likely to come from the east, battleaxe lot designs and a short 148m long (approx.) cul-de-sac road onto Viveash Road to the western side of the structure plan area were considered to be the most appropriate options. The battleaxe designs and cul-de-sac proposed comply with the technical requirements of the Guidelines for Planning in Bushfire Prone Areas.

Figure 8: Bush fire threat predominantly from the east



DFES Comments

DFES have raised a number of issues to be addressed prior to its support for the proposal.

A summary of DFES' responses, the bushfire consultant's responses and officer comments are provided within the table below.

Table 1: Summary of issues raised by DFES

1. Policy Measure 6.3 a) (ii) Preparation of a BAL Contour Map

DFES Issue	Bushfire Consultant's response	Officer Comment
BAL Contour Map Notwithstanding the vegetation classification cannot be validated based on the information provided, the BAL contours do not respond to vegetation	Action: Update Topography & Classified Vegetation Map (Figure 3.1) to include Asset Protection Zones for Lots 5, 6, 7, 8 & 9 to clarify the area of excludable vegetation	Noted. Modification to BMP required to reflect APZs as excludable vegetation within Topography & Classified Vegetation Map Post

proposed to be retained as shown on the Topography & Classified Vegetation Post Development map (figure 3.1). Attention is drawn to (post development) classified vegetation located outside of the building envelopes but within the nominated APZ for lots 5, 8 & 9. It is not clear why a consistent approach to exempting vegetation within nominated APZ's have not been applied. The BAL contours need to respond to the extent of classified vegetation, or figure 3.1 be revised to respond to the nominated APZ's.	post development works.	Development (Figure 3.1).
Building Envelope The BAL Contour Map should nominate a building envelope for lot 10 to demonstrate the ability of this lot to accommodate development within areas with a bushfire attack level BAL-29 or lower.	Proposed Lot 10 can be cleared – future Residential Zoning, no building envelope required. It is reasonable to expect the residual narrow strip of vegetation indicated in the western portions of Proposed Lots 8 & 9 outside of the indicative APZ's to be removed through subdivision and development of boundary fence-lines/construction of 3m firebreaks on Lots 8 & 9. Action: Update Topography & Classified Vegetation Map (Figure 3.1) & Update BAL Contour Map Post Development (Figure 3.2) to factor the required 3m firebreaks on proposed Lots 5, 6, 7,8 & 9 and adjust APZ' on Lots 8 & 9 to extend to western firebreak.	Confirmed. Lot 10 can be cleared under residential zoning and does not require a Building Envelope. Modification to BMP required to: • Topography & Classified Vegetation Map Post Development (Figure 3.1) • BAL Contour Map Post Development (Figure 3.2) to reflect required 3m firebreaks on proposed Lots 5, 6, 7,8 & 9 (i.e. lots over 4000sqm)
Vegetation Exclusion & Extent of Asset Protection	Development of asset protection zones (APZ's) does not require all	The lots within Area 6 can be cleared given the lot sizes and residential R5

Zones (APZ's) The post development exclusions applied to Area 6 and the proposed extent of APZ's cannot be substantiated without further clarification. For Area 6 to be excluded from classification the BMP relies on the establishment of an APZ for the full extent of the proposed lots and to provide sufficient separation for existing dwellings. The requirement for an APZ to apply to the entirety of any lot is contradicted by sections 2 and 5.2.2 of the BMP. Given these sections state that the defined APZ dimensions are not known at this stage and need only extend for the required separation distance in section 5.3.1 to achieve BAL-29, it is assumed that they relate solely to the larger lots 5-9 within Area 1. The BAL Contour Map should identify the extent of all APZ's and clarify to which lots any nominated APZ is indicative only. If unsubstantiated, the vegetation classification should be revised to apply the worst-case scenario taking into account the potential for revegetation as per AS3959, or the resultant BAL ratings may be inaccurate.	vegetation to be cleared to mineral earth. APZ's require the responsible management by the landowner to maintain fuel loads to the levels prescribed in the BMP and as annually updated in the Shire of Mundaring Firebreak and Fuel Load Notice. All onsite landscape planting within asset protection zones is to be managed in a low threat state as per the criteria detailed in AS3959-2018 s2.2.3(f) 'Low threat vegetation' and all other vegetation managed in accordance with the annual Shire of Mundaring Firebreak and Fuel Load Notice (Firebreak Notice). This ensures BAL separation distances can be effectively maintained and bushfire hazards on-site are effectively reduced. Section 5.3.1 BMP refers to the Planning requirement to achieve a BAL-29 or lower and includes a guidance note on how APZ's are to be applied. Action: Include notation applicable to proposed Lots 5, 6, 7, 8 & 9 Action: Include notation for all other proposed Lots to comply with the Shire of Mundaring Firebreak and Fuel Load Notice relevant to Lot area. <u>Area 6 Exclusion</u> *The 'Guidelines' state:* E2.1 Asset Protection Zones (APZ): The APZ should be contained solely within the	zoning. These lots consist of residential development, managed gardens, and low threat vegetation. Lots of this size generally have an APZ area which extends to the lot boundaries. Therefore the entire lot area is managed to a low fuel state in perpetuity. Based on this Area 6 is considered as "Excluded vegetation: AS3959 – 2.2.3.2 (e) (f)" consisting of non-vegetated areas and low threat vegetation. Lots 5,6,7,8 and 9 are larger residential R2.5 lots and the BAL contour map shows indicative APZ areas within and around the proposed Building Envelope locations. BMP to be modified to include appropriate notation For all lots: to maintain to a low fuel state within APZ area and comply with the Shire's Firebreak and Fuel Load Notice For lots 5,6,7,8 and 9 notating APZ areas are indicative only and extents to be established at development application stage.

	boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low fuel state on an ongoing basis, in perpetuity. The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context	
APZ Establishment The BMP terminology for standards to which the APZ's must be established and maintained is not consistent. The local government's firebreak notice standards are referenced in some sections, whilst the Schedule 1: Standards for Asset Protection Zones contained in the Guidelines are also referenced. When prescribing establishment and maintenance standards for APZ's the BMP should solely reference the Schedule 1 standards to avoid ambiguity. The local government may wish to consider the benefit of endorsing a Vegetation Clearing Plan (VCP) at a subsequent planning stage. An endorsed VCP would provide greater clarity for the proponent and landowners around the extent of significant vegetation to be removed to establish compliant APZ's.	*The 'Guidelines' state:* E2.1 Asset Protection Zones (APZ) It is the responsibility of the landowner/proponent to maintain their APZ in accordance with Schedule 1 *'Standards for Asset Protection Zones'*. It is further recommended that maintenance of APZs is addressed through the local government firebreak notice, issued under s33 of the *Bushfires Act 1954*, and preferably included in a Bushfire Management Plan specifically as a how-to guide for the landowner	The BMP is consistent with the Guidelines for Planning in Bushfire Prone Areas with respect to APZ requirements. The Shire's Firebreak and Fuel Load Notice is to be applied together with Schedule 1 of the Guidelines for APZ standards. APZ works which require vegetation modification or removal are assessed at development application stage. If any native vegetation within the APZ area needs to be completely removed to achieve the required BAL rating, this is denoted on the Bushfire Management Statement (BMS) at that time. A certificate of compliance is required to show the works have been completed prior to the Building Permit being issued.
Vegetation classification Vegetation Area 1 cannot be substantiated as Class C	Classification requirement for Area 1 – AS3959-2108, Class C Shrubland – Shrubs	Bushfire consultant's justification noted.

Shrubland with the limited information and photographic evidence available. Photo ID 1, 2 and 11 identifies vegetation consistent with Class D Scrub. The BMP should detail specifically how the classification was derived particularly where the potential for revegetation has not been considered, or the classification relies on height or foliage canopy cover calculations.	<2m high; greater than 30% foliage cover. Heights are easily determined due to the star-picket fencing along boundary fences being 1m to 1.1m height. Consultant height 1.75m. Predominant classifiable vegetation in this area not greater than 2m to 6m in height which is the criteria for Scrub classification. • Further Lot specific assessment can be undertaken at subdivision stage as required; • Re-vegetation of this area is not identified within the Local Structure Plan, therefore only current vegetation assessed.	Predominant vegetation within the area represents shrub classification based on height of vegetation. This area is not planned to be revegetated as part of structure plan proposal.
Vegetation classification Vegetation Area 3 cannot be wholly substantiated as Class G Grassland with the limited information and photographic evidence available. Photo ID 7 and 8 supports either a Class B Woodland or Class A Forest classification. The BMP should detail specifically how the classification was derived addressing the potential for revegetation and foliage canopy cover calculations.	Classification requirement for Area 3 – AS3959-2018 & Department of Planning Visual Guide for Bushfire risk assessment in Western Australia, Class G Grassland – All grassy structures, including situations with shrubs and trees, if the overstorey foliage is <10%. Area 3 is cleared paddocks as detailed in the BMP photo description and can be seen in the BMP aerial image (Figure 3.1) as containing buildings and extensive cleared areas. The majority of Area 3 falls outside of the 100m zone for the BAL Contour Mapping requirements. *Area 3 - Aerial image extract below of subject photo point area.*	Bushfire consultant's justification noted. Predominant vegetation within the area represents Grassland classification (refer aerial view below of subject area).

Area 3 - Aerial image extract below of subject photo point area.

2. Policy Measure 6.3 c) Compliance with the bushfire protection criteria

DFES Issue	Bushfire Consultant's response	Officer Comment
Location, and Siting and Design **A1.1 & A2.1 - insufficient information** The BAL ratings cannot be validated, as the vegetation classification inputs require clarification/modification as per the above table.	Responses as above table	Justification has been provided by the bushfire consultant regarding vegetation classifications.
Vehicular Access **A3.1 - comment** It is acknowledged that two access routes have been demonstrated. Nonetheless, consideration should be given to the sealed section of Tunnel Road being extended eastwards to intersect with Pechey Road to improve emergency access and egress.	**A3.1 - comment** The proposed road access has been assessed against the Bushfire Protection Criteria and can achieve the intent of the Element. *The 'Guidelines' state:* A3.1 Two access routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions. The Local Structure Plan documentation prepared by Statewest Planning has provided an overview of the justification for vehicle access considerations. *Section 2.4 Bushfire Hazard: "Ideally a road connection from Viveash Rd to Pechey Rd would be desirable. The slope of the land over the eastern portion of Lots 350 & 351, at 16-30% gradients, made this outside the realms*	**A3.1 - comment** Consideration has been given as advised and concluded that road gradients are too steep. Refer to comments under: • Lot Configuration / road layout; and • Battleaxe lots and Cul-de-sac design

	of normal road construction, and certainly well in excess of the 10 degrees (11%) set in SPP 3.7. "Zig zagging" a road down this slope would result in significant cut and fill earthworks devastating the hillside and vegetation resulting in a significant scarring and erosion risk." *"Consideration was also given to the extension of Tunnel Rd through to Pechey Rd, but with gradients in the order of 17%, this fails to comply with SPP 3.7. Discussions with Council staff (Planning and Engineering) has identified that the maximum road gradient they have approved in recent history was 13%, and they advise that they were reluctant to support that."*	
A3.3 - not demonstrated In bushfire prone areas, a cul-de-sac subdivision layout is not favoured because they do not provide access in different directions for residents. The BMP should investigate alternative road layouts. As a minimum, the BMP should provide justification as to why the cul-de-sac road cannot be extended to connect with Pechey Road and/or Tunnel Road. Further information should be provided to demonstrate compliance; or demonstrate a performance principle-based solution.	**A3.3 - not demonstrated** The proposed cul-de-sac has been assessed against the Bushfire Protection Criteria and can achieve the intent of the Element. The following requirements are achieved: A3.3 Cul-de-sac (including a dead-end road) • Requirements in Table 6, Column 2; • Maximum length: 200 metres (if public emergency access is provided between cul-de-sac heads maximum length can be increased to 600 metres provided no more than eight lots are serviced and the emergency access way is no more than 600 metres); and • Turn-around area requirements, including a	**A3.3 - not demonstrated** Alternatives have been investigated. The cul-de-sac design is an acceptable solution and fully complies with the technical requirements of the Guidelines for Planning in Bushfire Prone Areas. The cul-de-sac will be less than 200m long (148m approx.) with a road gradient no more than 10%, and a compliant 17.5m wide turnaround head. Refer to comments under: • Lot Configuration / road layout; and • Battleaxe lots and Cul-de-sac design

	minimum 17.5 metre diameter head. The Local Structure Plan documentation prepared by Statewest Planning has provided an overview of the justification for vehicle access considerations. Section 2.4 Bushfire Hazard: *"Finally, a dedicated fire escape was proposed connecting the proposed cul-de-sac to Tunnel Rd and providing emergency access to the rear of the Viveash Rd frontage lots. It still faced the same gradient issues as the road option (failure to comply with SPP 3.7). It was reviewed by Council staff (Planning and Emergency Services) and rejected on the basis that it would be unacceptable from a risk perspective. They formed the view that the current design complies with SPP 3.7 and would be safer. They advised that additional access is not necessary and would not be used in an emergency."*	
A3.4 - not demonstrated Battle-axe legs should be avoided in bushfire prone areas. The BMP does not consider options to avoid the two battle-axe lots. DFES does not accept that the location of the existing dwelling within lot 16 precludes options other than a battle-axe, and further notes that lot 20 does not contain an existing dwelling. Further information should be provided to demonstrate compliance; or demonstrate a performance principle-based solution.	**A3.4 - not demonstrated** The proposed battle-axe accesses have been assessed against the Bushfire Protection Criteria and can achieve the intent of the Element. The following requirements are achieved: A3.4 Battle-axe • Requirements in Table 6, Column 3; • Maximum length: 600 metres; and • Minimum width: six metres. Battle-axe Lot design for proposed Lots 16 and 19	**A3.4 - not demonstrated** The battleaxe legs fully comply with the technical requirements of the Guidelines for Planning in Bushfire Prone Areas. Proposed Lot 20 has direct frontage on to Tunnel Road and is not a battleaxe lot. Refer to comments under: • Lot Configuration / road layout; and • Battleaxe lots and Cul-de-sac design

	ensures occupants are exiting away from the potential source of bushfire, into an low threat area (built-up area) including the adjoining residential Lots, and have access to the existing Viveash Road which provides safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.	

Officers are satisfied that DFES comments can be addressed and do not represent any fatal flaws with the proposal. Provided the WAPC agrees with the Shire's proposed modifications, it is recommended that the WAPC requires a revised BMP be prepared prior to approving SP78.

Water Management

The application area is not constrained by wetlands, waterways, drinking water source areas or high groundwater levels, and there is low to nil risk of the presence of acid sulfate soils (ASS) on site.

Given there are no water resource management issues over the site, and limited infill is proposed (i.e 23 lots), a local water management plan is not required at structure planning stage.

The main component of the structure plan area that will have some impact on surface water run-off and drainage is the construction of the proposed short cul-de-sac road. This together with the limited infill proposed for new housing, will have minor impacts on water drainage for the area.

Drainage and stormwater management can be adequately addressed at subdivision stage, through the submission of a detailed drainage plan for the subdivision area.

Effluent Disposal

The *Government Sewage Policy 2019* (GSP) Section 2.4 recommends that, where relevant, local structure plans which propose on-site sewage disposal should be accompanied by a Site and Soil Evaluation (SSE) commensurate with the scale and nature of the proposal.

Section 5.2.2 'Separation from water resources' further stipulates:

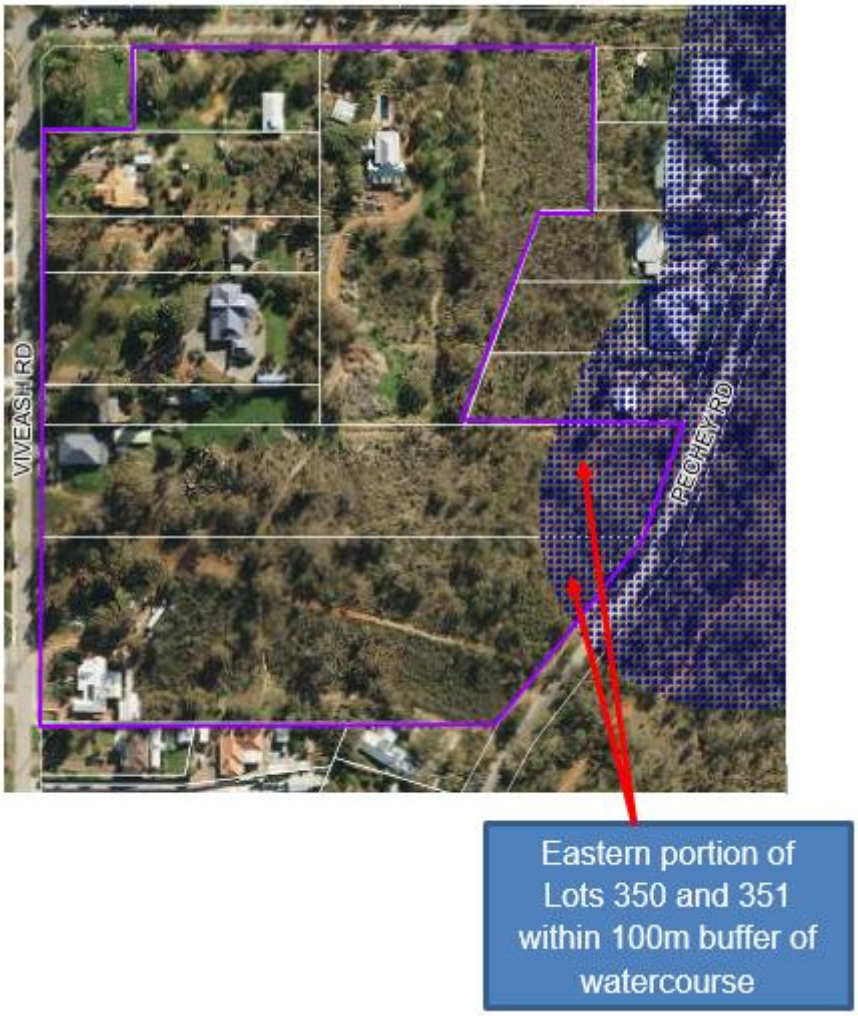
'An on-site sewage system is not to be located within 100m of a waterway or significant wetland and not within a waterway foreshore area or wetland buffer.'

Some of the proposed building envelopes on the R2.5 lots fronting Pechey Road (i.e. proposed Lots 6, 7 and 9) will fall within 100m of a mapped watercourse located within John Forrest National Park to the east.

An SSE was prepared by McDowell Affleck and submitted with the LSP for the proposed stage one which consists of the subdivision of Lots 350 and 351 Viveash Road into 14 new lots (which includes all proposed lots within 100m of the watercourse).

The findings of the SSE concluded that the sites are capable of accommodating onsite disposal of effluent for the proposed subdivision of Lots 350 and 351 Viveash Road. A reduced setback to the watercourse for Lots 6, 7 and 9 could be approved based on the soil capabilities identified. Secondary treatment systems with nutrient removal would be required on these lots via an Aerobic Treatment Unit (ATU), to ensure the watercourse is not affected by the treated effluent.

Figure 9: Lots located within 100m of nearby watercourse



The remaining lots could use flatbed leach drains suitably sized in accordance with AS1547:2012, *Government Sewerage Policy 2019* and the Shire of Mundaring Onsite Effluent Guidelines.

The proposed lots vary in size of between 2,000sqm to 4,418sqm therefore the provision of suitably sized disposal areas will not be an issue.

The remainder of the lots within the structure plan area can be subdivided independently, as two lot subdivisions. These lots all fall outside the 100m buffer from the watercourse. The structure plan area does not fall within a Public Drinking Water Source area or a Sewage Sensitive area. Based on the landform and soil types present, a SSE for the remainder of the lots is not required at the structure plan stage, and can be provided at the time of subdivision.

Traffic

The structure plan would create a total lot yield of 23 lots, which is an additional 15 lots from the existing eight lots. This would equate to a total population of approximately 58 persons, which is an increase of roughly 38 persons from the existing population within the structure plan area.

The WAPC's Traffic Impact Assessment (TIA) Guidelines, Volume 2 (August 2016) provides as a general guide that for every new residential lot created, approximately eight vehicle movements per day are generated. This would equate to an additional 120 vehicle movements per day with the additional 15 lots created.

The increase in traffic to the surrounding road network would be marginal given the limited infill proposed. These minor traffic increases will be easily absorbed via the existing road networks along Tunnel Road, Viveash Road and Pechey Road. Only one short 148m long (approx.) cul-de-sac road is required for access to seven (7) new lots. For these reasons a comprehensive Traffic Impact Assessment (TIA) was not considered necessary for the proposed structure plan area.

Heritage

There are no heritage listings on either the State Heritage Register or the Shire's Municipal Heritage Inventory.

A search of the Aboriginal Heritage Inquiry System mapping identifies three (3) Aboriginal heritage sites within the Swan View locality:

- Site 3492 – (Green Bullfrog Dreaming);
- Site 3720 – (Blackadder and Woodbridge Creeks); and
- Site 3759 – (Jane Brook)

The Aboriginal Heritage Inquiry System mapping identifies large areas around each site, but does not delineate the specific location of these sites to the public, to enable their protection.

To understand the implications the structure plan may pose on these identified sites, the applicant has been in contact with the Department of Planning, Lands and Heritage (DPLH), who confirmed the following:

> *"whilst your proposal does intersect with the public boundary of Aboriginal Sites ID's 3492, 3720 and 3759, it **does not intersect** with the boundaries as administered by DPLH. Therefore, there would be no further approvals required under the Aboriginal Heritage Act 1972."*

DPLH recommends the proponent refer to the State's 'Aboriginal Heritage Due Diligence Guidelines' available from their website, and undertake their own risk assessment regarding any potential impact to Aboriginal Heritage.

After assessing SP78 against the relevant parts of the planning framework and in light of the various submissions received, the Shire recommends to the WAPC that it supports SP78, subject to modifications.

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION

That Council:

1. Acknowledges all submissions made on Structure Plan 78 have been considered;

2. Acknowledges the assessment demonstrates Structure Plan 78 is generally compliant with the relevant parts of the planning framework;

3. Recommends the Western Australian Planning Commission approves Structure Plan 78, subject to the following modifications:

   A revised Bushfire Management Plan being prepared prior to WAPC's approval of the Structure Plan that incorporates:

   a. Mapped habitat trees across the proposed lots;

   b. Deletion of reference to non-compliant cul-de-sac access for Lot 103 on pages 32 and 35. Lot 103 has an existing compliant access and no further subdivision of this lot is proposed within SP78;

   c. Asset Protection Zones (APZs) to be reflected as excludable vegetation within 'Topography & Classified Vegetation Map Post Development' (Figure 3.1);

   d. Modification to 'Topography & Classified Vegetation Map Post Development' (Figure 3.1), and 'BAL Contour Map Post Development' (Figure 3.2) to reflect required 3m wide firebreaks on proposed Lots 5, 6, 7,8 & 9; and

   e. Notation for the establishment and maintenance of APZs on individual lots;

4. The following further details being approved by the WAPC, prior to the approval of subdivision, in accordance with Clause 24 of the *Planning and Development (Deemed provisions for local planning schemes) Regulations 2015*:

   a. Lots 4,27, 29, 30 Viveash Road and Lot 23 Tunnel Road requiring a habitat tree survey;

   b. All properties: Identification and protection of significant populations of Priority species, *Beaufortia purpurea* within areas of vegetation classified as 'good' to 'very good', to ensure priority flora is not impacted by subdivisional works;

c. All properties: Significant tree retention/removal plan to maximise retention of habitat and other significant trees;

d. All properties: A Dieback Management Plan to identify appropriate management practices for preventing the spread of Phytophthora dieback, ensuring all machinery, particularly earth moving equipment is clean (i.e. free of soil and vegetative materials) on entry to the site;

e. Location of building envelopes for R2.5 lots to minimise disturbance to vegetation classified as ‘good’ to ‘very good’;

f. Street tree planting in accordance with the Shire of Mundaring Street Trees policy PS-08;

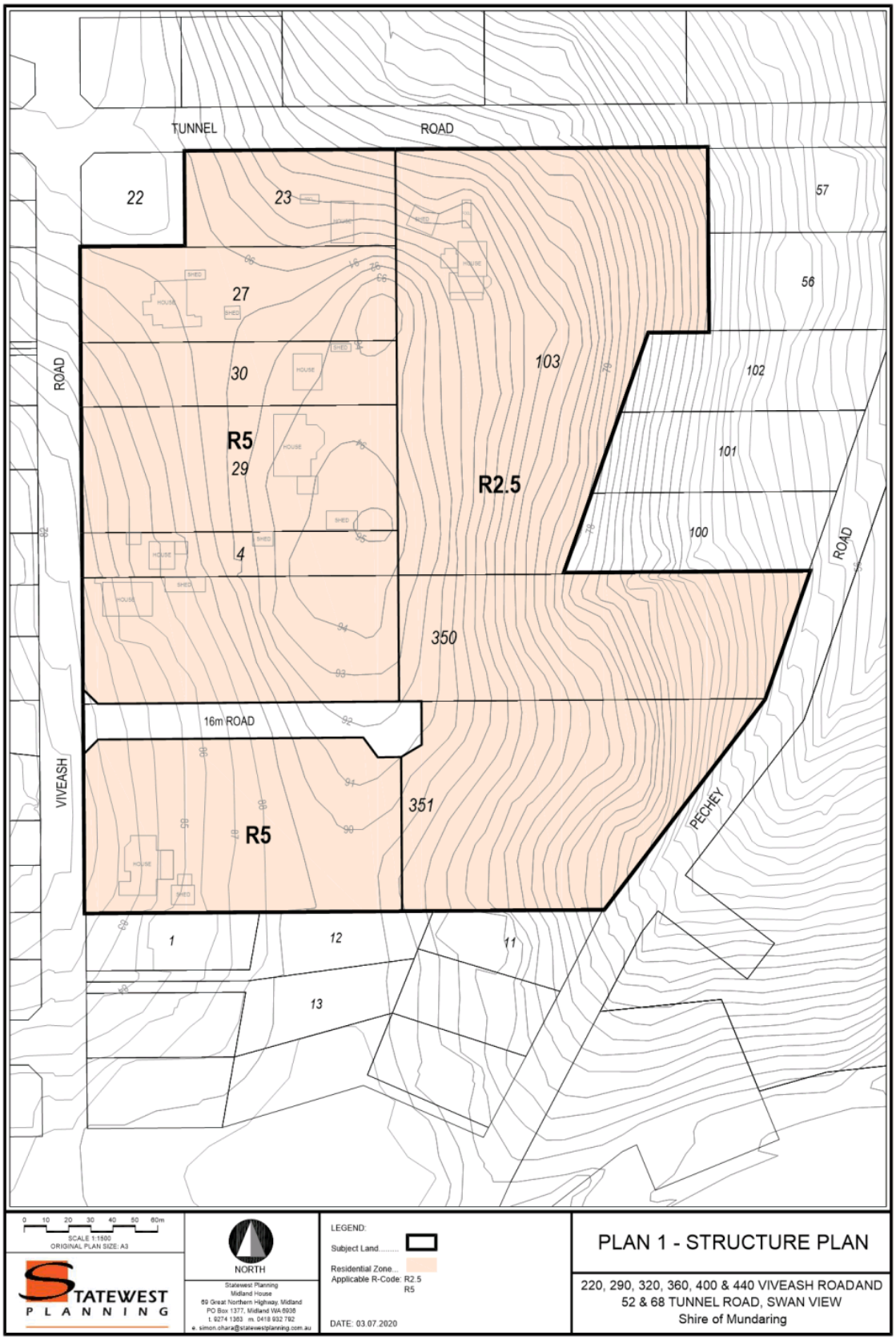
g. Detailed design for construction of the 16m wide road reserve (cul-de-sac) providing a suitable road alignment for the retention of significant trees, detailing the location of shared paths, street lighting and connection with Viveash Road;

h. Lots 4, 27, 29, 30 Viveash Road and Lots 23 & 103 Tunnel Road requiring a site and soil evaluation (SSE) demonstrating the suitability of the land for onsite effluent disposal, to determine the type of on-site sewage treatment system required and the appropriate location for on-site sewage disposal;

i. Section 70A (*Transfer of Land Act 1893*) notifications to be required for lots as identified within SP78 that an on-site secondary treatment and disposal system for sewage is required (i.e. Aerobic Treatment Unit);

j. All properties and cul-de-sac: Detailed drainage plan showing stormwater retention on-site, or appropriately treated and connected to local drainage system; and

k. Crossover location plan demonstrating coordinated crossover locations for lots with reduced width frontages.


TUNNEL
ROAD
22
23
57
56
27
30
103
102
ROAD
R5
29
R2.5
101
100
4
ROAD
350
16m ROAD
VIVEASH
351
R5
PECHEY
1
12
11
13
0 10 20 30 40 50 60m
SCALE 1:1500
ORIGINAL PLAN SIZE: A3
NORTH
STATEWEST PLANNING
Statewest Planning
Midland House
69 Great Northern Highway, Midland
PO Box 1377, Midland WA 6936
t. 9274 1383 m. 0418 932 782
e. simon.ohara@statewestplanning.com.au
LEGEND:
Subject Land.....
Residential Zone...
Applicable R-Code: R2.5
R5
DATE: 03.07.2020
PLAN 1 - STRUCTURE PLAN
220, 290, 320, 360, 400 & 440 VIVEASH ROADAND
52 & 68 TUNNEL ROAD, SWAN VIEW
Shire of Mundaring

LOCAL STRUCTURE PLAN

for

LOTS 351, 350, 4, 29, 30, 27 & 22 VIVEASH ROAD AND Lots 23 & 103 TUNNEL ROAD, SWAN VIEW

Prepared by
STATEWEST PLANNING
November 2019
Revised June 2020

CERTIFIED THAT THS STRUCTURE PLAN WAS ADOPTED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON

…… Date

Signed for and on behalf of the Western Australian Planning Commission

……

an officer of the Commission pursuant to section 16 of the *Planning and Development Act 2005* for that purpose, in the presence of:

…… Witness

…… Date

And by

RESOLUTION OF THE COUNCIL OF THE SHIRE OF MUNDARING ON

…… Date

And

PURSUANT TO THE COUNCIL'S RESOLUTION HERUNTO AFFIXED IN THE PRESENCE OF:

……
Shire President, Shire of Mundaring

……
Chief Executive Officer, Shire of Mundaring

…… Date

This Structure Plan is prepared under the provisions of the Shire of Mundaring Local Planning Scheme No 4

Modification No.	Description of Modification	Endorsed by Council	Endorsed by WAPC
1	Response to SSE		

EXECUTIVE SUMMARY

This Local Structure Plan (LSP) involves 8 privately owned lots in the locality of Swan View. The existing lots range in size from 2,835m2 to 2.5040ha. The site is zoned for 'Residential' under the Shire of Mundaring Local Planning Scheme No 4 with R Coding of R5 over the western section and R2.5 over the eastern section.

Topographically the site is divided in two by a north-south ridgeline that essentially follows the separation between the R Codings. The gradients to the west are gently inclined at around 8-10%. To the east they are moderately inclined at 14-20%. All lots have been developed for residential purposes. Much of the site has been cleared of native vegetation and developed as gardens or just left cleared. East of the ridgeline there are pockets of native regrowth vegetation.

The LSP provides for coordinated subdivision of the subject area into lot sizes consistent with the applicable R Coding. Maximum lot yields have not been achieved due to a variety of constraints.

Public Open Space (POS) is not proposed. In consultation with the Shire, landowners will pay cash-in-lieu.

Item	Data	Structure Plan Ref
Total Area Covered by the structure plan	8.9207ha	1.2.2
Area of each land use proposed: - Residential	Hectares / Lot yield 8.9207 / 23	1.2.2, 2.7.3
Total estimated lot yield	23	2.7.3
Estimated number of dwellings	23	2.7.1
Estimated residential site density	2.6 dwellings per ha	2.7.3
Estimated population	58	2.7.1
Number of high schools	0	N/A
Number of primary schools	0	N/A
Estimated commercial floor space	0	N/A
Estimated area and percentage of public open space given over to: - Regional open space - District open space - Neighbourhood parks - Local parks	 0ha 0ha 0ha 0ha	1.3.1, 1.3.3, 2.7.2

CONTENTS

Part One - Statutory

Part Two – Explanatory

PLANS

APPENDICES

PART ONE – STATUTORY

1. STRUCTURE PLAN AREA

The subject area comprises Lots 351, 350, 4, 29, 30 & 27 Viveash Rd and Lots 23 & 103 Tunnel Rd, Swan View. It totals 8.9207ha.

2. OPERATION

This LSP becomes effective as at the date of its endorsement by the WAPC. After this date, the LSP can be used by the Shire of Mundaring, and all other Government Agencies involved in the assessment of subdivision applications, to support individual subdivision applications, be they for the whole of the subject area or only a portion of it. It can also be used by the WAPC as a basis of granting subdivision approval.

Nothing within this shall preclude the WAPC from making a decision, or imposing conditions, at variance with this LSP. The WAPC shall have due regard to, but is not bound by, the LSP when determining an application for subdivision approval for a property contained within the LSP.

Any modifications to this Plan are to be made in accordance with the procedures set out in section 5.17.14 of LPS 4.

3. STAGING

The small scale of the Structure Plan and the availability of services enable much of the area to be independently developed. Lot 350 Viveash Rd will rely on the proposed road on Lot 351 Viveash Rd for frontage to its proposed lots. This is proposed to be the first stage of subdivision.

4. SUBDIVISION AND DEVELOPMENT REQUIREMENTS

Subdivision of the land shall be carried out in accordance with this LSP, which has been developed in accordance with the Subdivision Design Requirements contained in Section 5.8 of LPS 4. Lot sizes are consistent with those provided under the R5 and R2.5 codings contained in the Residential Design Codes.

Use class permissibility is contained in Table 1 of LPS 4. The requirements for the Residential zone apply. This LSP has no specific requirements in terms of land use, other than specific controls on the extent of uses prescribed within this document.

There are no Regional or Foreshore reserves required for this site. In consultation with the Shire cash-in-lieu will be provided instead of Public Open Space and is provided at a rate of 10% in accordance with WAPC Policy *DC 2.3 Public Open Space in Residential Areas*.

Development of the lots created through this LSP shall comply with the Residential Design Codes in all respects except as follows:

a) Where Building Envelopes have been designated in the LSP, all development shall be contained within those Envelopes unless approval is granted by Council for development to occur outside the designated Envelope.

Native vegetation on the site is restricted to the eastern portion. This area is coded R2.5, which, due to the lower density than the western portions R5 coding, will assist in protecting the vegetation. In addition, building envelopes in this area will restrict the developable area on each R2.5 lot.

The first stage of subdivision will be Lots 350 & 351 Viveash Rd. The costs for the construction of the road will be shared and the developers of Lot 350 will be required to contribute 50% towards the value of the land provided as road for the length of the road fronting the lots proposed on Lot 350.

5. OTHER REQUIREMENTS

There are no other requirements.

PART TWO – EXPLANATORY

1. PLANNING BACKGROUND

1.1 Introduction & Purpose

This LSP has been prepared to coordinate subdivision of the subject properties as and when the respective owners choose to proceed. It has been prepared to address the requirements of the Shire of Mundaring Local Planning Scheme N° 4, specifically section 5.17.

Due to the nature of the site, particularly the small area, limited subdivision potential of the majority of the lots and the low density residential coding (R5 & R2.5), there is little required to coordinate. Nonetheless, there may be a community expectation that some form structure plan will be produced to demonstrate how subdivision can take place without prejudicing individual landowners. This structure plan will provide the community with an opportunity to contribute to the process.

1.2 Land Description

1.2.1 Location

The subject site is located at the eastern edge of the Swan View locality (refer Location Plan). To the west of the site is well established R12.5 & R20 density residential development. To the north and south is R5 & R2.5 density residential development and to the east are residential (R2.5) properties and the John Forrest National Park

1.2.2 Area and Land Use

The subject site is 8.9207ha in area and comprises 8 privately owned lots. They are described below:

Lot 351 (No 220) Viveash Rd	2.5040ha
Lot 350 (No 290) Viveash Rd	1.7806ha
Lot 4 (No 320) Viveash Rd	0.2835ha
Lot 29 (No 360) Viveash Rd	0.7955ha
Lot 30 (No 400) Viveash Rd	0.4060ha
Lot 27 (No 440) Viveash Rd	0.6007ha
Lot 23 (No 52) Tunnel Rd	0.4001ha
Lot 103 (No 68) Tunnel Rd	2.1503ha

Historically, the land west of the ridgeline has been cleared as a result of residential activity. East of the central ridgeline is a mixture of residential development (Lot 103 Tunnel Rd) cleared land and remnant scrubland with some remnant trees. All lots contain dwellings and outbuildings.

1.2.3 Legal Description and Ownership

Copies of the Certificates of Title for each of the lots within the LSIP area are attached at Appendix 1. The subject lots are described below:

Lot No	Vol/Folio	Plan/Dia No	Owner/s
351	1416/261	Plan 301544	BW & LJ Buttsworth
350	1158/456	Plan 301544	KL & JED Gatti
4	1312/997	D32599	C & EM Branson
29	1871/178	D16318	G & AM Velletri
30	1141/686	D16318	AS & KA Dobson
27	1736/281	P223134	R Canosa
23	2948/832	P411571	ES Hart
103	2723/224	P61465	CL Snell

1.3 Planning Framework

1.3.1 Zoning and Reservations

The site is zoned 'Urban' under the MRS.

The site is zoned 'Residential' under the Shire of Mundarings LPS 4 with R Codings of R5 over the western portion and R2.5 over the eastern portion.

The site contains no local or regional reserves, although a regional Parks and Recreation reserve (John Forrest National Park) is located to the east of the site as shown in the Location Plan.

1.3.2 Regional and Sub-Regional Structure Plans

The subject site is not contained in any Regional or Sub-Regional Structure Plans.

1.3.3 Planning Strategies

LPS 4 Local Planning Strategy

The Shire of Mundaring has a Local Planning Strategy that supports LPS 4. In terms of Swan View, the only applicable strategy is that the Council wishes to advocate for the extension of reticulated sewerage to unsewered residential areas in the locality. The subject site is one such location. Reticulated sewer is available on the west side of Viveash Rd, and the house on Lot 351 is connected to that sewer. Extensive investigations with the Water Corporation by the proponents of this Structure Plan, involving the Shire of Mundaring and a consulting Engineer, resulted in the Water Corporation advising that this site is not capable of connection to reticulated sewer.

Shire of Mundaring POS Strategy

The Council also has a Public Open Space (POS) Strategy which identifies this site as providing POS in the form of cash-in-lieu for the upgrading of the nearby heritage trail.

Shire of Mundaring Local Biodiversity Strategy

Produced in 2009, this Strategy was utilised as a key component in the Councils LPS 4, which was gazetted in 2014. The two documents work together in trying to balance the need for growth in order to create a sustainable community whilst retaining valuable natural resources where practicable. The Strategy in its recommendations recognised the development potential of the LSP area. It identified some areas of Priority 1 & Priority 3 conservation (refer Plan 3). It also accepted the Residential zoning of the land and classified them with a protection category of "Limited Protection / Already Committed by Zoning" (refer Plan 4).

1.3.4 Policies

Government Sewerage Policy
Released in September 2019, this policy requires the provision of reticulated sewerage for all subdivisions where it can be provided. Where it can't be provided (as is the case with this site – refer s.1.3.3 above), the policy requires the proponent to demonstrate the capability of the site to accommodate on-site effluent disposal. This is discussed in detail in s.2.2 below.

WAPC DC 1.1 – Subdivision of Land General Principles
This policy sets out the process of land subdivision, including the need (in some cases) for Structure Plans to coordinate subdivision, developer contributions, and the provision of infrastructure.

WAPC DC 2.2 – Residential Subdivision
DC 2.2 provides broad guidance on residential subdivision, including lot sizes, lot configuration, and connections to infrastructure. The LSP complies with these.

WAPC DC 2.3 – Public Open Space in Residential Areas
In consultation with the Shire and as outlined in the Shire's POS Strategy the LSP area is not identified as a location for the provision of POS and the standard requirements will take the form of cash-in-lieu of POS to facilitate upgrading of the adjacent heritage trail.

WAPC DC 2.6 – Residential Road Planning
This policy focuses on residential road hierarchy and road design, critically permeability, variety, legibility and accessibility. It accommodates motor vehicle, cycle and pedestrian traffic movement. These aspects are incorporated into the design, recognising that only one, short cul-de-sac is proposed in this LSP.

Guidelines for the Preparation of Structure Plans (WAPC)
These Guidelines state the purpose of a local structure plan is to deal with residential density, subdivision, and the coordination of infrastructure on a neighbourhood or smaller scale. The information provided is to be relevant to the site and commensurate with the scale of planning being undertaken. Discussion with the local government and DPLH staff has identified that the key elements are subdivision coordination and response to bushfire and environmental issues.

Better Urban Water Management Guidelines
This policy provides a process to achieve urban water management at various levels through the Planning system. This will often take the form of a Local Water Management Strategy at the Structure Plan stage. In this instance, there are no wetlands on the site, no watercourses, no drainage channels, no high groundwater levels and low to nil risk of acid sulphate soils. The water regime (drainage) would be affected by subdivision (caused by a short road and the construction of new homes). This is reflected in the SSE that accompanies this LSP. These are minor and it is standard practice for an Urban Water Management Plan to be required as a condition of subdivision, when the details of the subdivision construction design are known.

Residential Design Codes
Being zoned Residential, this site is subject to the Residential Design Codes. This will place constraints on some lots, notably Lot 4 Viveash Rd which, at 2,835m2, has no mathematical subdivision potential.

SPP 3.7 Planning in Bushfire Prone Areas
This Structure Plan is located within a mapped bushfire prone area, and is therefore subject to the provisions of SPP 3.7. A Bushfire Management Plan has been prepared which identifies how the risk arising from bushfires is to be mitigated, and is discussed within the Site Conditions and Constraints section.

1.3.5 Other Approvals and Decisions
Under the Shire of Mundarings Local Planning Scheme No 3 (no longer current), this location had a Local Subdivision and Infrastructure Plan (LSIP 134) covering it. This LSIP failed to facilitate subdivision over the subject area for two decades. Under the new (current) LPS 4 the R coding was increased over the western portion to the current R5.

In 2015 a subdivision application over Lot 29 was refused primarily on the basis of the absence of a Structure Plan. More recently a subdivision of the land on the corner of Viveash and Tunnel Rds was approved without a Structure Plan. That subdivision created Lot 23 which is included in this Structure Plan.

1.3.6 Pre Lodgement Consultation
Prior to lodgement of this Structure Plan, consultation has occurred with:

- Shire of Mundaring (Messrs A Money, C Jennings, J Dooner & Ms M Bradfield);
- Department of Planning Lands & Heritage (Messrs M Selby & A Cook)
- Water Corporation (Mr B Coombes)

2. SITE CONDITIONS AND CONSTRAINTS

2.1 Biodiversity and Natural Area Assets
As mentioned above, extensive portions of this LSP area have been cleared to accommodate residential development, including domestic gardens, with some pockets of remnant vegetation and regrowth (refer Aerial Photo). Nonetheless a portion of the site has been identified as Local Natural Area by the Shire of Mundaring, albeit with limited protection due to the existing zoning. This affects Lots 351, 350 & 103. These are the three largest lots with all other lots having been cleared for residential development.

In view of the mapped LNA's Terratree Pty Ltd was commissioned to carry out a spring survey and black cockatoo habitat assessment of Lots 351, 350 & 103. That document forms part of this LSP and is provided at Appendix 2.

The assessment states that much of the area is densely infested with weed species. It found no Priority or Threatened Ecological Communities.

The assessment found no Threatened (Declared Rare) Flora. One Priority species, *Beaufortia purpurea*, was found, present throughout the Vegetation Type 1 area as a main understorey species. This species is not protected under the Biodiversity Conservation Act. The Terratree

report recommends minimization of impact on the species by marking out the plant prior to ground disturbance. This will be done at subdivision.

A large portion of the survey area (77.24%) was rated as either 'Degraded' or 'Completely Degraded'. Pockets on each lot were mapped as 'Good' and 'Very Good'. These are mapped on the subdivision concept plan (Plan 6). There were no areas that qualified as 'Excellent' or 'Pristine'.

As mentioned above, the LNA's were identified through the Councils Local Biodiversity Strategy (LBS). Section 5.1 of that Strategy deals with the levels of protection for local natural areas. This site is identified in the category of "Limited Protection / Already Committed by Zoning". In relation to this category, the LBS states:

"Where residential subdivision takes place, most LNAs will be lost, due to clearing for development or for protection and/or hazard reduction zones to reduce bushfire hazard for residences. However, some vegetation retention may be possible in some circumstances, particularly in the delineation of Public Open Space."

This acknowledges that subdivision will occur consistent with the zoning and R Coding of the land. It also acknowledges that if the vegetation is of significance it could be protected in POS. Consultation with the Local Government resulted in no POS being required. In this instance the LSP proposes building envelopes on the R2.5 coded lots to reduce clearing impacts on the vegetation. Furthermore, bushfire management doesn't require wholesale clearing of land within the Asset Protection Zone (that will extend outside the building envelopes). It involves management of vegetation to designated standards contained with the Bushfire Management Plan and Councils annual bushfire notices.

A total of 13 potential black cockatoo habitat trees were located. These have also been mapped on the subdivision concept plan. The recommendations of the report are:

- *Ensure machinery entering site, especially earth-moving equipment is 'clean on entry' to the survey area i.e. free of soil and vegetative materials to prevent the introduction of weeds and pathogens;*
- *If significant populations of Priority flora are to be impacted, then every effort should be made to minimize impacts by demarcating populations prior to ground disturbance activities;*
- *Impacts to Black Cockatoo habitat should be focused on avoidance and mitigation, as per **Table 2** in the EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (SEWPAC 2012). Specific recommendations for the survey area include:*
  - *Trees that provide significant habitat for Black Cockatoos should be retained if possible during construction; and*
  - *Avoidance and control of the introduction of pathogens and plant diseases during activities which may negatively impact retained or surrounding habitat of the development.*

Building envelopes on the LNA affected lots will also protect the significant trees. Proposed lot boundaries and the proposed new road reserve have been aligned to enable the retention of potential black cockatoo habitat trees.

2.2 Landform and Soils

Topographically the site is divided in two by a north-south ridgeline that essentially follows the separation between the R Codings. The gradients to the west are gently inclined at around 8-10%. To the east they are moderately inclined at 14-20%.

Elevations on the site range from 94m AHD at the top of the ridge dropping to 65m AHD at the NE corner of Lot 103, 60m at the NE corner of Lot 350, and 81m AHD at the SW corner of Lot 351.

The site contains no watercourses or wetlands of any description. There are rock outcrops across the site in the undeveloped areas on the top of and the east side of the ridge. This variation in characteristics reflects the difference in the R Codings.

Soil mapping in the Darling Range Rural Land Capability Study (DRRLCS) conducted by the Department of Agriculture and Food (DAFWA) stops slightly short of this site. By extension of the existing mapping just north-west of the site along the same ridgeline, soils across the site will be Darling Scarp (DS2), which is described as:

"Moderate to steeply inclined high relief slopes at the western edge of the Darling Plateau. Variable moderately well to well drained duplex and gradational soils formed from weathering of granites and gneisses, and intruded doleritic parent materials. The soils are formed in situ or from colluvium and are generally moderately deep to deep. Rock outcrop is common."

Table 1 (below) tabulates the DS2 capabilities.

Descriptions of the DS2 land unit in the DRRLCS include its characteristics as:

- Moderately high to high nutrient retention ability
- Moderately well draining
- Moderate microbial purification
- Low risk of waterlogging or inundation
- No flood risk

The above demonstrates that the site is capable of supporting on-site effluent disposal. Other factors that the Government Sewerage Policy (GSP) takes into consideration in determining if a site should be considered for on-site disposal are:

- Is the site in a designated Public Drinking Water Supply area? This site is not (refer Plan 7).
- Is the site in a designated Sewage Sensitive Area? The site is not.

The site is within a low to no risk Acid Sulphate Soils area.

Confirming these characteristics is a Site & Soil Evaluation (SSE) conducted by McDowall Affleck Pty Ltd on the 3 June 2020. The SSE is included at Appendix 3 and forms part of this LSP. It concluded that all proposed lots can sustain on-site effluent disposal systems.

2.3 Groundwater and Surface Water

The site contains no watercourses or wetlands. The SSE found no evidence of a high groundwater table. This is to be expected in this location in the Darling Scarp foothills.

2.4 Bushfire Hazard

The land has been mapped as bushfire prone and a Bushfire Management Plan (BMP) has been prepared for the structure plan site. The exposure of this site to bushfire, mainly from the east, was a key design consideration. Accessibility was reviewed critically.

Ideally a road connection from Viveash Rd to Pechey Rd would be desirable. The slope of the land over the eastern portion of Lots 350 & 351, at 16-30% gradients, made this outside the realms of normal road construction, and certainly well in excess of the 10 degrees (11%) set in SPP 3.7. "Zig-zagging" a road down this slope would result in significant cut and fill earthworks devastating the hillside and vegetation resulting in a significant scarring and erosion risk.

Consideration was also given to the extension of Tunnel Rd through to Pechey Rd, but with gradients in the order of 17%, this fails to comply with SPP 3.7. Discussions with Council staff (Planning and Engineering) has identified that the maximum road gradient they have approved in recent history was 13%, and they advise that they were reluctant to support that.

Consideration was also given to creating an internal road connection from Viveash Rd to Tunnel Rd. This would have essentially been in the form of an extension of the proposed cul-de-sac northwards along the western boundary of Lot 103 to connect to Tunnel Rd. This would have also had the benefit of providing road frontage to the rear of the Viveash Rd frontage lots. Unfortunately the gradients at the northern section are in the order of 14%.

A more gradual gradient could be achieved by diverting this road alignment in a north-easterly direction, but it would then not provide the secondary road frontage to the Viveash Rd lots, and it would push the road through the very good quality vegetation and rock outcrops.

Finally, a dedicated fire escape was proposed connecting the proposed cul-de-sac to Tunnel Rd and providing emergency access to the rear of the Viveash Rd frontage lots. It still faced the same gradient issues as the road option (failure to comply with SPP 3.7). It was reviewed by Council staff (Planning and Emergency Services) and rejected on the basis that it would be unacceptable from a risk perspective. They formed the view that the current design complies with SPP 3.7 and would be safer. They advised that additional access is not necessary and would not be used in an emergency.

The BMP has been prepared in accordance with SPP3.7 and Guidelines for Planning in Bushfire Prone Areas version 1.3 and is included in Appendix 4. The BMP demonstrates that future buildings on new lots will be located within areas of BAL-29 or lower.

Table 1

	RURAL RESIDENTIAL			HOBBY FARMING/AGRICULTURE			WATER SUPPLY			
Land Unit	Rural retreat (housing, roads & effluent disp.)	House and road construction	Effluent disposal (septic tanks)	Grazing	General annual horticulture	General perennial horticulture	Irrigation water supply+ (best option)	Earth dam rating (D)	Groundwater bore rating (B)	Stream supply rating (S)
Darling Scarp										
DS2	III a	II	III a	II	III e,k	II	III h (D)	III h	IV g	V j

Legend* to Table 1

Capability class		Capability subclass	Land quality
I	Very high capability	a	Soil absorption ability
II	High capability	e	Water erosion risk
III	Fair capability	g	Groundwater availability
IV	Low capability	h	Dam site construction suitability
V	Very low capability	j	Surface water availability
		k	Soil workability

2.5 Heritage
A review of Councils Municipal Inventory revealed no sites of significance.

A search of the Aboriginal Heritage Inquiry System identified three potential sites:

- Site 3492 (Green Bullfrog Dreaming). This area measures approximately 16km2 and includes portions of the localities of Swan View, Stratton, Jane Brook, Middle Swan, Midvale and John Forrest National Park.
- Site 3720 (Blackadder and Woodbridge Creeks). At approximately 24km2 this site includes the localities of Swan View, Greenmount, Darlington, Koongamia, Bellevue, Midvale, Midland, Viveash, Caversham, Middle Swan, Stratton, Jane Brook and the John Forrest National Park.
- Site 3759 (Jane Brook). This site also covers an area of approximately 24km2. It includes portions of the localities of Swan View, Stratton, Middle Swan, Caversham, West Swan, Red Hill, Jane Brook and the John Forrest National Park.

2.6 Coast and Foreshores
Not applicable for the subject site.

2.7 Context and Other Land Use Constraints and Opportunities
The site is located at the eastern edge of the long established residential locality of Swan View. It forms a transitional area to the John Forrest National Park to the east, which is reflected in the R coding.

2.7.1 Land Use
Land use will be single residential. On the basis of the anticipated lot yield (2.7.3 below) this would result in a total population of 58, based on 2016 ABS statistics for Swan View that state there are 2.5 persons per household. As there are currently 8 houses, this would mean the actual increase in population would be 38 persons. No commercial, community or other land uses are proposed.

2.7.2 Open Space
Public Open Space will be provided as cash-in-lieu of land, consistent with the Shire of Mundaring's POS policy (refer 1.3.3 above).

Public Open Space Schedule

Item	Data	Structure Plan Ref
Site Area	8.9207ha	1.2.2
Less	0ha	
Net Site Area	8.9207ha	1.2.2
Deductions	0ha	
Gross Subdivisible Area	8.9207ha	1.2.2
Public Open Space @ 10%	0.8921ha	
Public Open Space contribution	0ha	1.3.3
Restricted POS proposed	0ha	
Public Open Space provision	0ha	

2.7.3 Lot Sizes / Configuration

Lot sizes will be consistent with the R5 or R2.5 coding that applies to the site under the current zoning. They will also respond to the site constraints including vegetation, access and existing house locations, resulting in lot sizes ranging from 1,998m2 to approximately 1.68ha. A conceptual subdivision configuration is provided at Plan 6. This will result in a total lot yield of 23 or 2.6 dwellings per ha.

As mentioned above, Lot 4 Viveash Rd has no subdivision potential due to its lot size.

Lot 30 Viveash has mathematical potential for subdivision but is constrained by the R Codes. It has a frontage of 28.8m, already under the required 30m frontage. Creation of a vacant lot at the front of the property would require a 6m wide battle-axe leg because the area is mapped as bushfire prone, reducing the frontage to 22.8m. The narrowness of the lot would push the boundary between the front and rear lots right up against the front of the existing house. It would also result in the access leg comprising approximately 526m2, or 25.6% of the rear (house) lot area, which exceeds the maximum 20% stated in the R Codes. Consideration was given to reducing the width of the access leg by sharing access with the lots on either side, but the houses to the north and south are close to their respective common boundaries.

Several options for the subdivision of Lot 103 were considered and discussed with Council staff. The vegetation and rock outcrop, combined with the topography and bushfire issues made these options unacceptable.

2.7.4 Movement Network

Each of the three existing road frontages – Viveash Rd, Tunnel Rd and Pechey Rd - is constructed to sealed standard. Tunnel Rd is not constructed beyond 205m from Viveash Rd, ie, its eastern section remains unconstructed. This section is unlikely to be constructed due to the steepness of the terrain (approx. 17% gradient) and its construction is not necessary to service any new lots.

A new subdivision road (cul-de-sac) will be installed on Lot 351. This will service lots proposed to be created out of existing Lots 350 & 351. Its alignment will enable the protection of two identified potential black cockatoo habitat trees.

2.7.5 Water Management

Due to the small scale of this structure plan, water management is proposed to be designed at subdivision stage. The general principles of dealing with stormwater run-off are discussed in the SSE.

2.7.6 Infrastructure Coordination, Servicing and Staging

Overhead power, telecommunications and reticulated water is available to the site.

Reticulated sewer is connected to the house on Lot 351, but, as mentioned above, the Water Corp advise that the Structure Plan is not able to be serviced. Accordingly effluent will need to be disposed of on site.

Due to the fragmentation of land ownership, it is likely that the subdivision of land within the LSP will take place in stages. These are yet to be determined and will be dependent on owners' ambitions and the property market. The owners of Lots 350 & 351 have expressed a

wish to proceed. The balance of the landowners can subdivide independently. Subdivision conditions and the resulting supporting documentation and works will respond to the individual stages. Coordination of infrastructure is not required due to the small scale of the structure plan and the availability of existing infrastructure.

2.7.7 Other Requirements

Upgrade requirements for existing roads shall be determined by the Local Government at the time of subdivision. All lots shall ultimately be provided with sealed and drained road frontage to Local Government specifications.

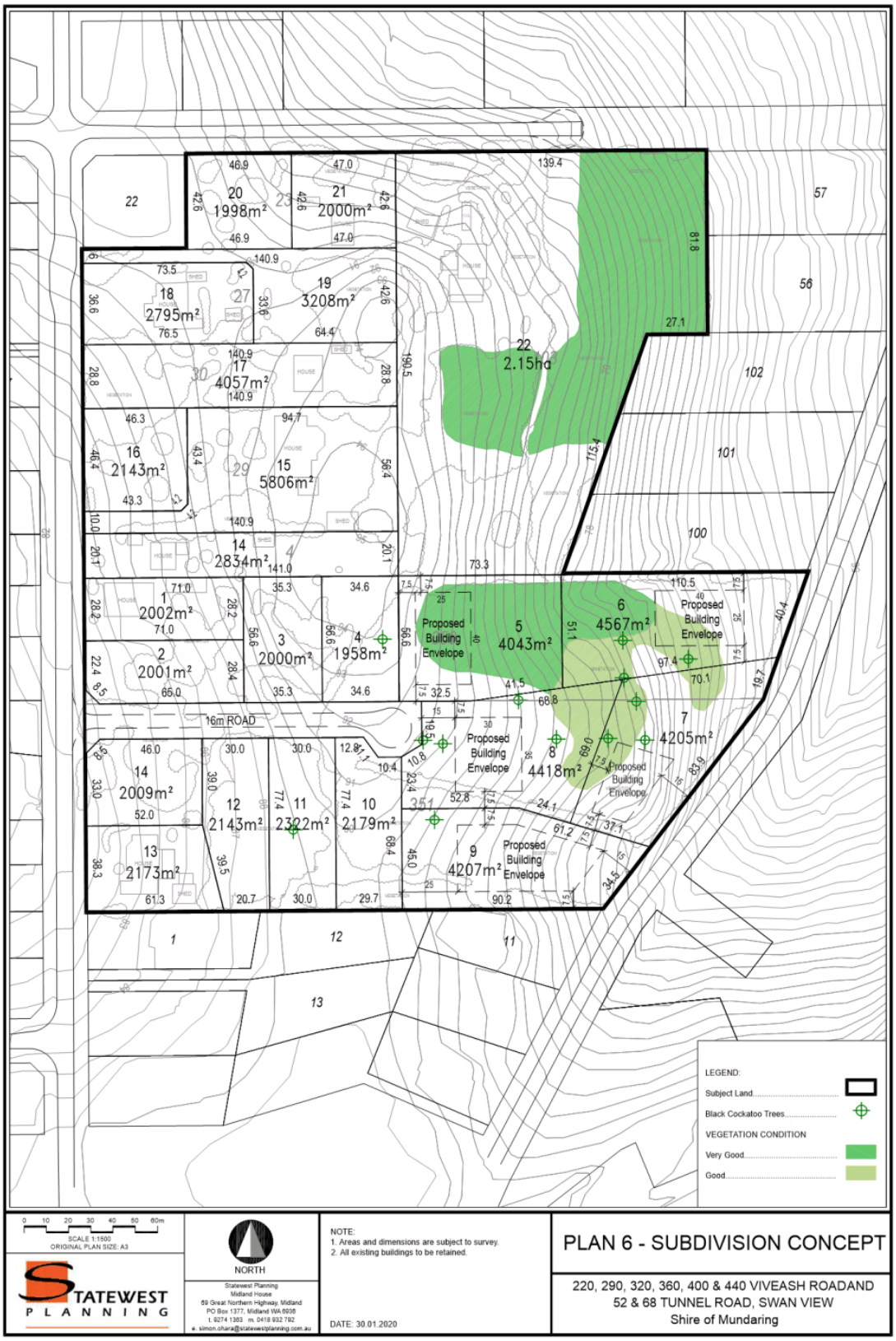
The proposed new subdivision road shall be created and constructed by the owners whose proposed lots front that road when those lots are proposed to be created. Where shared roads are proposed the owners of the adjoining lots will be required to share the road requirements in terms of land and cost of development unless alternative arrangements are made, and approved by the Local Government, to ensure that all proposed lots have adequate road frontage.

All subdividers are to ensure that development of their site conforms with the requirements of the Aboriginal Heritage Act 1972 (as amended).

Effluent disposal systems shall be installed in accordance with the recommendations of the Local Government based on site specific assessment.

The structure plan area is located within a bushfire prone area. A BMP was submitted as part of the application (Appendix 4) to demonstrate lots within the concept plan were capable of development. To ensure bushfire risk is appropriately mitigated, any subdivision application within the structure plan area will be required to be accompanied by an updated BAL assessment and BMP.

Portions of the structure plan area are located within a Local Natural Area. These proposed lots have designated building envelopes. No clearing of vegetation is permitted outside of the building envelope without the prior written approval of the Local Government. The requirement for retaining vegetation will need to be balanced with the requirements for clearing for subdivision works and bushfire risk management.


Proposed Building Envelope
16m ROAD
LEGEND:
Subject Land
Black Cockatoo Trees
VEGETATION CONDITION
Very Good
Good
NORTH
NOTE:
1. Areas and dimensions are subject to survey.
2. All existing buildings to be retained.
DATE: 30.01.2020
PLAN 6 - SUBDIVISION CONCEPT
220, 290, 320, 360, 400 & 440 VIVEASH ROADAND
52 & 68 TUNNEL ROAD, SWAN VIEW
Shire of Mundaring
STATEWEST PLANNING

Structure Plan No. 78

220 (Lot 351), 290 (Lot 350), 320 (Lot 4), 360 (Lot 29), 400 (Lot 30) Viveash Road and Tunnel Road, Swan View

Schedule of Submissions

Submission No. / Submitter	Comment	Response
1. South West Aboriginal Land and Sea Council	South West Aboriginal Land and Sea Council represents (SWALSC) the native title rights and interests of Whadjuk Noongar People. On behalf of the Whadjuk People we express our concerns regarding the perceived impact the proposed development may have on the Aboriginal Registered sites ID 3492, ID 3720 and ID 3759, all of particular significance to Whadjuk People. The three sites are protected under the Aboriginal Heritage Act (WA) 1972. SWALSC is not aware of any consultation with Whadjuk People and how the proposed registered sites will be protected from injury or desecration. It is imperative that our clients are consulted in a genuine way in relation regarding the care and protection of these three very important registered sites. Mixed	Section 2.5 of the Structure Plan 78 report acknowledges sites of significance. The applicant has contacted Department of Planning Lands and Heritage (DPLH) with respect to the sites identified. It was confirmed by DPLH that no further approvals are required under the *Aboriginal Heritage Act 1972*. Refer to 'Aboriginal Heritage' assessment within report.
2.	We tried 5 years ago to subdivide our property (lot 29) but were unsuccessful. This Structural Plan is in full accordance with what we want to do so we fully support this subdivision. We feel that this structural plan will improve the aesthetic appeal of the area and reduce fire hazard as well. Support	Noted.
3.	As a home owner in the area, the addition of so many new properties concerns me. Swan View is already rife with antisocial and criminal behaviour that is uncontrolled due to the sheer number of incidents. The police cannot keep up with the current population (through no fault of their own) - I cannot imagine adding to their workload if it can be avoided. Please keep us safe. I already feel unsafe in my own home at times.	Crime is a policing matter and the proposal is not inconsistent with CPTED principles (Crime Prevention Through Environmental Design). Development on future lots can help reduce the opportunities for crime through additional passive surveillance between houses and public streets.

Submission No. / Submitter	Comment	Response
	Object	
4.	I believe that these new homes will cause overcrowding in an area that already has a ridiculously high crime rate. We are already considering leaving this area due to local increases in crimes, this would force us out of the area. Object	The land is zoned for Urban development; future development is expected to reflect this. The R2.5 and R5 zonings within the LSP area are comparatively low residential densities providing lot areas between 2,000sqm to 4,000sqm. The residential zone and densities are consistent with the underlying Urban zone of the MRS. Refer to comment on Submission 3.
5.	I feel that building multiple close contact homes in the middle of both a global pandemic and during a month where the Mundaring shire and local police have proven to have little, to no control over the local crime rate. These buildings are guaranteed to give way to a rise in local crime rate and we do not wish to be victims of this. Object	Refer to comment on Submission 3.
6.	I wish to register my concerns about the proposed plan intended to - subdivide eight lots into 23 - construct an internal road (cul-de-sac) in the Viveash Road/Tunnel Road area of Swan View. While I appreciate "progress" I believe it to be a poorly considered option for an area bordering the National Park for the following reasons: - it does not consider the unique disposition of the area and will subsequently bring increased traffic, increased traffic noise and an environmental impact on residents and already stressed native animals, and birds. This increase in traffic and speed has been witnessed by myself and family as a result of the neighbouring subdivision in Jane Brook. An unprecedented "right" to speed has compromised many animals including native wood ducks, and kangaroos who come down from the hills looking for water and food. - This area is unique. It provides a haven for animals and birds rarely seen in city areas. Housing estates in the area not only encroach upon the natural habitats of these animals, they ruin opportunities for people to enjoy the peace and tranquility the hills provide for recreation.	SP78 would create an additional 15 lots to the 8 lots that currently exist (i.e. a total of 23 lots). In terms of additional traffic increase, this would be marginal with the existing road networks capable of accommodating traffic volumes well in excess of the increase resulting from an additional 15 lots. Only one short cul-de-sac road is proposed which would not allow vehicles to reach high speeds. Speed limits are enforced by the WA police and outside the Shire's jurisdiction. The lot configuration and road alignment within SP78 has been carefully designed to enable the retention of identified habitat trees across the site. Development will be located in areas to avoid pockets of vegetation identified as 'good' to 'very good' condition where possible. The cul-de-sac will be a public road used intermittently for access purposes, and will be separated from existing neighbouring lots by proposed new residential lots which will be a minimum 2,000sqm in area. Any perceived loss of privacy from the cul-de-sac cannot be substantiated given this layout. Furthermore noise levels generated by vehicle movements along the cul-de-sac will not be beyond what would normally be expected in an urban zone.

Submission No. / Submitter	Comment	Response
	- I am concerned the position of the cul-de-sac will not only create a loss of privacy to my /my neighbour's properties, it will impact with an increase in obstructive traffic and traffic noise turning into Viveash Road and travelling the neighbourhood. I do not believe the consultation period has been sufficient for residents to discuss the proposal and I do not believe the Shire have consulted sufficiently for the residents to understand and share their grievances. Although your letter is dated 8 July, I received it on or around the 13 July. With the closing being the 31 July, that is insufficient notice in my mind for residents as I have mentioned, to better understand the proposal. Please do not create an endless array of tight housing that blight the face of a beautiful area of land and ruin the future of our bushland, tranquil spaces and fauna/flora that exist happily amongst us. Provide our children with a space that richly exemplifies a desire to preserve something for their future, to enjoy. Thank you for considering these points, I look forward to your response.	The structure plan was advertised in accordance with the Shire's Advertising Planning Applications Policy. Refer to comment on Submission 3 and 4.
7.	It is with interest we (owners of above address) note the proposed structure plan 78. Our concern to this structure is the 77 metre fence line that boarders our property 140 Viveash Road Swan View that would have to accommodate 4 adjoining lots ie: lot 9,10,11,12. The concern to us is that if there were to be 4 different types of fence structures on the above 4 lots it would devalue our property. Our question, is it possible to have included in Plan 78 fencing that is uniform (same) for the entire length of the fence line? Hope this meets with some consideration. Mixed	Individual subdividers are responsible for installing appropriate fencing at subdivision stage. Neighbours are encouraged to work together to achieve mutually beneficial outcomes regarding boundary fencing. This is not considered a matter requiring structure plan provisions.
8.	I object to the subdivision that goes through from Viveash to Pechey Road development The opening of opening of Pechey Road through to Jane Brook already increased traffic and people are prone to speeding. This proposed development will make this area even more dense and dangerous to local residents and wildlife. Often there are ducks/Kangaroos and some unfortunately do not make it. It is beautiful natural environment and more high density living would not do us or our wildlife and fauna any good	Refer to comment on Submission 3, 4 and 6.

Submission No. / Submitter	Comment	Response
	Object	
9. Atco Gas	ATCO Gas as owner of the gas distribution network and infrastructure has no objection to the proposed Structure Plan. Gas distribution mains are in the vicinity with the road reserve of Viveash Road and a portion of both Tunnel Road and Pechey Road. Support	Noted.
10.	I live at the top end of Tunnel Road and object to the proposed housing development. It will substantially increase traffic to the area. Tunnel Rd is already used as a thoroughfare through to residents on Weston Drive and further along Viveash Rd. A proposed 23 extra lots with an internal road will create a considerable amount of extra traffic. It is potentially 46 extra cars traveling along Viveash and Tunnel Rd if all 23 residents have 2 cars. It will add an increased risk to native wildlife. We get kangaroos along Viveash and sometimes along Tunnel as well. The increased traffic will either drive them from the area or put them in harm's way. A housing development will add noise pollution to an otherwise quiet corner of Swan view, where the chatter of birds and the laughs of kookaburras can be heard above the sound of traffic. We have only 1 park in the area, does this new housing development add to the public amenities or just take up space, resources and create traffic? I don't believe this new housing development will add to the quite landscape, where large established blocks discretely merge with national park. Object	Refer to comment on Submission 3, 4 and 6. SP78 proposes a cash-in-lieu contribution (equivalent to 10% of the land area) for Public Open Space (POS) for the upgrading of the nearby heritage trail. Proposed densities provide a transition from R5 to R2.5 to the east.
11. Department of Water and Environmental Regulation	Thank you for referring proposed Structure Plan No. 78 for the Department of Water and Environmental Regulation to consider. Given the minimal environmental and water constraints, the Department has no comments to provide.	Noted.
12. Water Corporation	Thank you for your correspondence dated 9th July 2020. We offer the following comments in regard to this proposal.	Noted.

Submission No. / Submitter	Comment	Response
	Water Reticulated water services are currently available throughout the subject area. To serve the proposed Number of Lots proposed within this Structure Plan Layout. Water main extensions will be required and must be laid within the existing and proposed road reserves, on the correct alignment and in accordance with the Utility Providers Code of Practice. Water Zones exist within the Structure Plan area, the water reticulation extensions/strategy will need to be established by the developer's consultant engineers at the subdivision stage in consultation with our Land Servicing Section. (See attached Plan) **Wastewater** Reticulated sewerage is not available to serve any further development within the subject area. **General Comments** The developer is expected to provide all water and sewerage reticulation if required. A contribution for Water, Sewerage and Drainage headworks may also be required. In addition the developer may be required to fund new works or the upgrading of existing works and protection of all works. Water Corporation may also require land being ceded free of cost for works. The information provided above is subject to review and may change. If the proposal has not proceeded within the next 6 months, please contact us to confirm that this information is still valid.	
13. Department of Education	Thank you for your letter dated 8 July 2020 providing the Department of Education (Department) the opportunity to comment on the abovementioned proposed Local Structure Plan (LSP). The Department has reviewed the reports in support of the LSP and has no objections to the proposal. The Department acknowledges that the adoption of the LSP will result in a negligible increase to the dwelling yield for the area. The increase will not unreasonably affect the capacity and operation of the public schools within the area.	Noted.
14.	The landowner of ..... writes in support of Structure Plan No. 78.	Noted.

<table>
<tr><th>Submission No. / Submitter</th><th>Comment</th><th>Response</th></tr>
<tr><td>15. DFES</td><td>I refer to your email forwarded on 9 July 2020 regarding the submission of a Bushfire Management Plan (BMP) (revision 1.1), prepared by Bushfire Prone Planning and dated 16 June 2020, for the above Local Structure Plan.

It should be noted that this advice relates only to State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7) and the Guidelines for Planning in Bushfire Prone Areas (Guidelines). It is the responsibility of the proponent to ensure that the proposal complies with all other relevant planning policies and building regulations where necessary. This advice does not exempt the applicant/proponent from obtaining necessary approvals that may apply to the proposal including planning, building, health or any other approvals required by a relevant authority under other written laws.

Assessment
1. Policy Measure 6.3 a) (ii) Preparation of a BAL Contour Map

<table>
<tr><th>Issue</th><th>Assessment</th><th>Action</th></tr>
<tr><td>BAL Contour Map</td><td>Notwithstanding the vegetation classification cannot be validated based on the information provided, the BAL contours do not respond to vegetation proposed to be retained as shown on the Topography & Classified Vegetation Post Development map (figure 3.1).

Attention is drawn to (post development) classified vegetation located outside of the building envelopes but within the nominated APZ for lots 5, 8 & 9. It is not clear why a consistent approach to exempting vegetation within nominated APZ's have not been applied. The BAL contours need to respond to the extent of classified vegetation, or figure 3.1 be revised to respond to the nominated APZ's.</td><td>Modification to the BMP is required.</td></tr>
<tr><td>Building Envelope</td><td>The BAL Contour Map should nominate a building envelope for lot 10 to demonstrate the ability of this lot to accommodate development within areas with a bushfire attack level BAL-29 or lower.</td><td>Modification to the BMP is required.</td></tr>
</table>
</td><td>Refer to 'Bushfire' assessment within report.</td></tr>
</table>

Submission No. / Submitter	Comment			Response
	Vegetation Exclusion & Extent of Asset Protection Zones (APZ's)	The post development exclusions applied to Area 6 and the proposed extent of APZ's cannot be substantiated without further clarification. For Area 6 to be excluded from classification the BMP relies on the establishment of an APZ for the full extent of the proposed lots and to provide sufficient separation for existing dwellings. The requirement for an APZ to apply to the entirety of any lot is contradicted by sections 2 and 5.2.2 of the BMP. Given these sections state that the defined APZ dimensions are not known at this stage and need only extend for the required separation distance in section 5.3.1 to achieve BAL-29, it is assumed that they relate solely to the larger lots 5-9 within Area 1. The BAL Contour Map should identify the extent of all APZ's and clarify to which lots any nominated APZ is indicative only. If unsubstantiated, the vegetation classification should be revised to apply the worst-case scenario taking into account the potential for revegetation as per AS3959, or the resultant BAL ratings may be inaccurate.	Modification to the BMP is required.	
	APZ Establish-ment	The BMP terminology for standards to which the APZ's must be established and maintained is not consistent. The local government's firebreak notice standards are referenced in some sections, whilst the Schedule 1: Standards for Asset Protection Zones contained in the Guidelines are also referenced. When prescribing establishment and maintenance standards for APZ's the BMP should solely reference the Schedule 1 standards to avoid ambiguity. The local government may wish to consider the benefit of endorsing a Vegetation Clearing Plan (VCP) at a subsequent planning stage. An endorsed	Modification to the BMP is required.	

<table>
<tr><th>Submission No. / Submitter</th><th>Comment</th><th>Response</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>VCP would provide greater clarity for the proponent and landowners around the extent of significant vegetation to be removed to establish compliant APZ's.</td><td></td></tr>
<tr><td>Vegetation classification</td><td>Vegetation Area 1 cannot be substantiated as Class C
Shrubland with the limited information and photographic evidence available. Photo ID 1, 2 and 11 identifies vegetation consistent with Class D Scrub.

The BMP should detail specifically how the classification was derived particularly where the potential for revegetation has not been considered, or the classification relies on height or foliage canopy cover calculations.</td><td>Modification to the BMP is required.</td></tr>
<tr><td>Vegetation classification</td><td>Vegetation Area 3 cannot be wholly substantiated as Class G Grassland with the limited information and photographic evidence available. Photo ID 7 and 8 supports either a Class B Woodland or Class A Forest classification.

The BMP should detail specifically how the classification was derived addressing the potential for revegetation and foliage canopy cover calculations.</td><td>Modification to the BMP is required.</td></tr>
<tr><td colspan="3">2. Policy Measure 6.3 c) Compliance with the bushfire protection criteria</td></tr>
</table>
</td><td></td></tr>
<tr><td></td><td>
<table>
<tr><th>Issue</th><th>Assessment</th><th>Action</th></tr>
<tr><td>Location, and Siting and Design</td><td>A1.1 & A2.1 - insufficient information
The BAL ratings cannot be validated, as the vegetation classification inputs require clarification/modification as per the above table.</td><td>Modification to the BMP is required.</td></tr>
<tr><td>Vehicular Access</td><td>A3.1 - comment
It is acknowledged that two access routes have been demonstrated. Nonetheless, consideration should be given to the sealed section of Tunnel Road being extended eastwards to intersect with Pechey Road to improve emergency access and egress.</td><td>Comment</td></tr>
</table>
</td><td></td></tr>
</table>

Submission No. / Submitter	Comment		Response
	A3.3 - not demonstrated In bushfire prone areas, a cul-de-sac subdivision layout is not favoured because they do not provide access in different directions for residents. The BMP should investigate alternative road layouts. As a minimum, the BMP should provide justification as to why the cul-de-sac road cannot be extended to connect with Pechey Road and/or Tunnel Road. Further information should be provided to demonstrate compliance; or demonstrate a performance principle-based solution.	Modification to the BMP is required.	
	A3.4 - not demonstrated Battle-axe legs should be avoided in bushfire prone areas. The BMP does not consider options to avoid the two battle-axe lots. DFES does not accept that the location of the existing dwelling within lot 16 precludes options other than a battle-axe, and further notes that lot 20 does not contain an existing dwelling. Further information should be provided to demonstrate compliance; or demonstrate a performance principle-based solution.	Modification to the BMP is required.	
	<u>Recommendation - not supported modification required</u> The BMP does not adequately address the policy requirements of SPP 3.7 and the Guidelines. It is acknowledged that the land is zoned residential with an expectation of subdivision, however this lot and the area to the east is an extreme bushfire risk area and the precautionary principle should apply. DFES has assessed the Structure Plan and accompanying BMP. Several issues that need to be addressed prior to support of the proposal (refer to the tables above).		Refer to 'Bushfire' assessment within report.

Submission No. / Submitter	Comment	Response
16.	Structure Plan 78 looks like it has been done purely to satisfy subdivision of lot 350 and 351. As a landowner in this structure plan the lack of consultation during this process has been disappointing. Lots 4, 27, 29 and 30 do not appear to have the amount of consideration required to make the best use of the land available. If consultation on this structure plan were discussed with all landowners other options could have been explored to satisfy the potential of their lots. As all of the lots on Viveash Road are currently R5 wand most have subdivision potential in their own right It is not clear why they have needed to be included in this plan. Mixed	A series of design options were explored as part of the preparation of SP78. A road to the rear of lots 4, 29, 30, 27 and 23 was investigated, but due to the topography, terrain and location of existing development would be difficult to achieve a 16m wide road reserve and would exceed acceptable road gradients where it would connect to Tunnel Road to the north. Furthermore this design would require further removal of onsite vegetation. A road to the rear of these lots would provide no additional benefit in terms of access / egress in an emergency as it would merely loop back to Viveash road to the west. Battleaxe lot designs have therefore been recommended over Lots 27 and 29. The landowners of both these properties have confirmed in writing their support of SP78. Lot 4 does not have sufficient land area for further subdivision. Lot 30, for reasons stipulated within the assessment of the report, could not achieve a compliant battleaxe lot design, due to a reduced lot frontage and a battleaxe leg that would require more than 20% of the total site area. Although not technically relevant to the consideration of this structure plan, the applicant has stated that approximately 18 months prior to the submission of SP78 letters were mailed to each landowner to advise that planning was being initiated to prepare a Structure plan over the area and to identify interest from the other landowners. Once lodged with the Shire, SP78 was further advertised to landowners within the Structure Plan area in accordance with the Shire's Advertising Planning Applications Policy.
17.	I drove by area yesterday as I was concerned about development due to the proximity of John Forrest National Park. I have known the area for 40 years as a frequent park user. A large percentage of the proposed development is very important habitat, food source and roosting site for endemic plants and wildlife. Extremely important wildlife corridor, linking to other reserves nearby. I believe the large blocks leading into National Park were zoned to be this size to protect the wildlife and flora existing on properties creating access to JFNP. The wildlife in area will have no safe, wildlife corridor to park. The proposed property will have special creatures living and using area. The western pygmy possum ,honey possum, mardo, quendas, echidna, red eared firetail finch, western spinebill, chuditch, cockatoo, bats, native bees insects and rock wallabies etc. These creatures live in area and need protecting. Please do not approve this development as is. The wildlife corridors are important and the buffer from the intense surrounding developments is imperative to save more bushland on proposed sites.	Refer to comment on Submission 4 and 6.

Submission No. / Submitter	Comment	Response
	My other major concern on sites like these is when tiny creatures like the honey possums which dont come up on wildlife surveys. Also the way bush is developed where heavy machinery clear sites and burn piles of habitat. The wildlife remain in their homes and killed. This area brings in endless tourists to the national park, people come from surrounding built up suburbs or city, please keep the properties with bush intact, and the beautiful bushland views. Thankyou for your time. I feel very fortunate to live in such a beautiful place. I spend many hours in and around John Forest National Park, volunteering my time to surveying and weeding and enjoying the sounds of the forest. I have seen the wildlife struggle as surrounding developments near national park take out wildlife corridors for the beautiful rock wallabies and cockatoos come back to nesting hollows and food sources removed. Object	

FPA AUSTRALIA | Fire Protection Association Australia | Life. Property. Environment.

BPAD Bushfire Planning & Design

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: 220, 290, 320, 360, 400 & 440 Viveash Road and 52 & 68 Tunnel Road, Swan View		
Suburb: SWAN VIEW	**State:** WA	**P/code:** 6056
Local government area: Shire of Mundaring		
Description of the planning proposal: Structure Plan - moderate number of Lots		
BMP Plan / Reference Number: 180153	**Version:** v1.0	**Date of Issue:** 07/11/2019
Client / Business Name: Proponent - Statewest Planning		

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	☐	☒
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☐	☒
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☒

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

N/A

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name Kathy Nastov	**Accreditation Level** Level 3	**Accreditation No.** BPAD 27794	**Accreditation Expiry** 01/08/2020
Company Bushfire Prone Planning		**Contact No.** 6477 1144	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner K. Nastov **Date** 07/11/2019

BUSHFIRE PRONE PLANNING

Bushfire Management Plan

(Local Structure Planning)

220, 290, 320, 360, 400 & 440 Viveash Road and 52 & 68 Tunnel Road, Swan View

Shire of Mundaring

Job Number:	180153
Assessment Date:	22 October 2019
Report Date:	7 November 2019

BPP Group Pty Ltd t/a Bushfire Prone Planning
ABN: 39 166 551 784

Level 1, 159-161 James Street
Guildford WA 6055

PO Box 388
Guildford WA 6935

Ph: 08 6477 1144
Email: admin@bushfireprone.com.au

Disclaimer

The measures contained in this Bushfire Management Plan are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions. Additionally, the correct implementation of the required bushfire protection measures (and any associated response/evacuation plan if applicable) will depend, among other things, on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith based on information available to Bushfire Prone Planning at the time.

All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents - arising out of the services provided by their consultants.

Document Control

Version	Version Details	Date Submitted
1.0	Proposed Structure Plan for future Subdivision - BMP	7-Nov-19
1.1	Proposed Structure Plan for future Subdivision – BMP (Amendment to subdivision plan)	16-Jun-20

Author	Accreditation	Signature
Greg Dunstan	BPAD Level 1 - No. 16382	
Co-author		
-	-	-
Reviewed/Approved		
Kathy Nastov	BPAD Level 3 - No. 27794	

Document Content Compliance Statement
This Bushfire Management Plan (the Plan) provides the required information to address State Planning Policy No. 3.7: Planning in Bushfire Prone Areas - December 2015 (SPP 3.7), the associated Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 (Guidelines), and any additional information as directed by the WA Planning Commission (WA Department of Planning, Lands and Heritage). It is fit for accompanying a planning application.
Subdivision BMP v7.3

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List of Figures

Executive Summary

Bushfire Prone Planning (BPP Group Pty Ltd) has been commissioned by the landowners to prepare a Bushfire Management Plan to accompany the Structure Plan application for 220, 290, 320, 360, 400 & 440 Viveash Road and 52 & 68 Tunnel Road, Swan View. The land consists of 9.0ha Residential zoned land with potential to subdivide into 23 Lots.

Contained within this report, contour mapping is utilised to visually show the potential radiant heat impacts (from bushfire prone vegetation), as separate Bushfire Attack Level contours across the site. The BAL's have been derived for the proposed Lots within the assessed area. The purpose is to inform future development planning by determining or indicating the Bushfire Attack Levels (BAL's) that future buildings, within each Lot, are potentially subject to.

Against the Bushfire Protection Criteria, the decision maker's assessment of a future Proposal will be on the basis of it being able to meet the Acceptable Solutions, once construction and landscaping is complete, as follows:

- For Element 1 'Location', the subdivision (Lot) is able to achieve the acceptable solution (by being located in an area that will on completion be subject to BAL-29 or less);
- For Element 2 'Siting and Design' the Proposal is able to meet the acceptable solutions by habitable buildings being able to achieve an Asset Protection Zone (APZ) of sufficient size to ensure the radiant heat impact does not exceed BAL-29. APZ's will be managed in a low-fuel state within each new Lot;
- For Element 3 'Vehicular Access', the location of the Structure Plan and future subdivision of the Lots is able to meet the current acceptable solution A3.1 and E3.1 (provision of two access routes to different destinations); and
- For Element 4 'Water', the Location of the Lot is able to achieve the acceptable solution (it is located in reticulated water supply area where hydrants are available for fire-fighting operations).

Future buildings within 100 metres of classified vegetation will be constructed to standards which correspond to the determined BAL's, as required by AS 3959-2018 Construction of buildings in bushfire prone areas. As this proposal does not identify the actual location of building works within each Lot, there may be a requirement to determine the BAL ratings for individual building works once a building site has been identified.

1 The Proposal and Purpose of the Plan

1.1 Details

Proponent:	Statewest Planning
Site Address:	220, 290, 320, 360, 400 & 440 Viveash Road and Lots 52 & 68 Tunnel Road, Swan View.
Local Government:	Shire of Mundaring
Structure Plan Area:	9.0ha
No. of Proposed Lots:	23 Lots
Planning Stage:	Strategic - Local Structure Plan - Lot layout known
Subdivision Type:	Subdivision - moderate number of lots
Overview of the Proposal:	Bushfire management planning assessment and report of the Structure Plan area for future subdivision potential.
Bushfire Prone Planning Commissioned to Produce the Plan by:	Landowners/Proponent
Purpose of the Plan:	To accompany a planning application
For Submission to:	WA Planning Commission (WAPC) & Shire of Mundaring

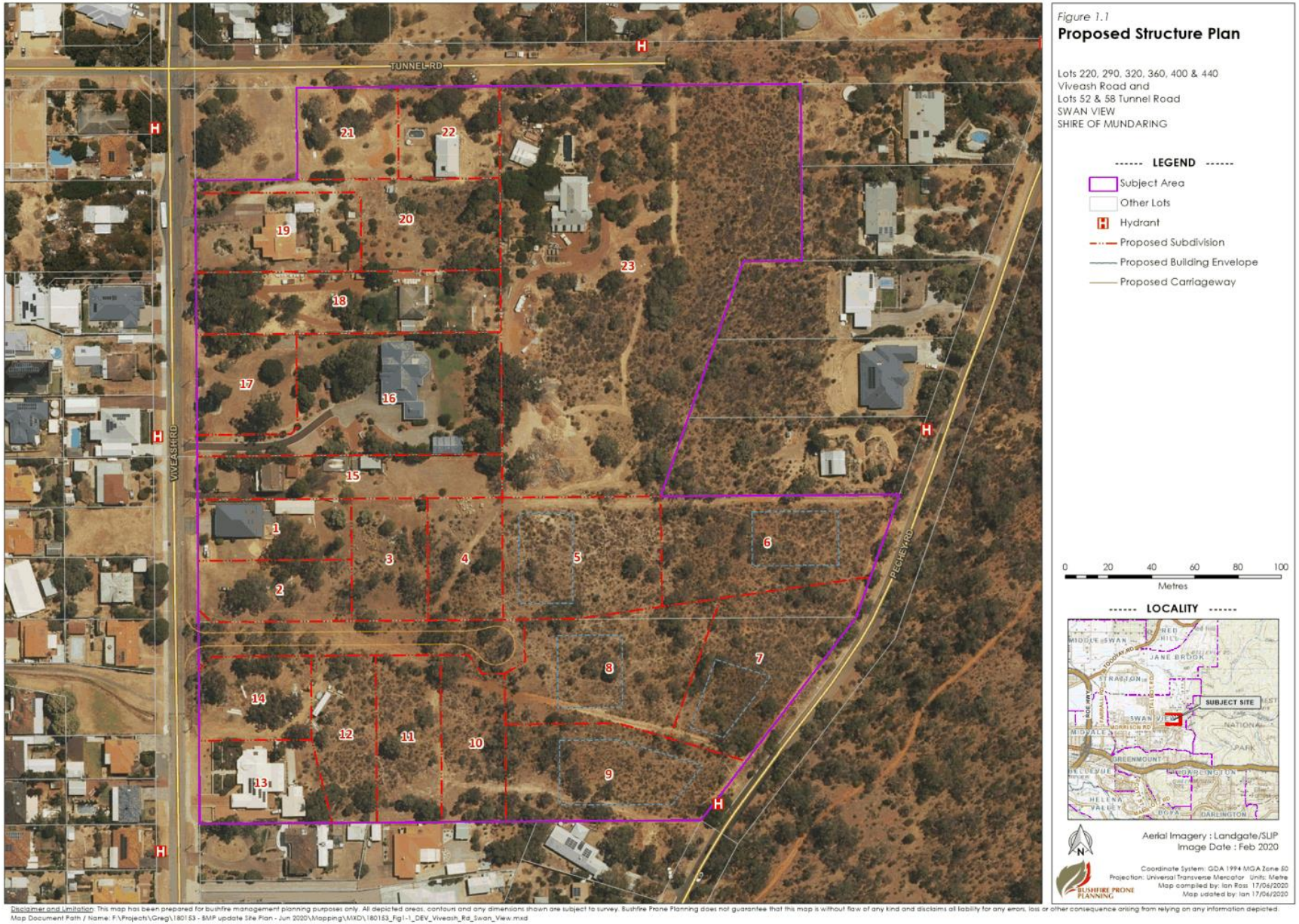
TUNNEL RD
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Figure 1.1
Proposed Structure Plan
Lots 220, 290, 320, 360, 400 & 440
Viveash Road and
Lots 52 & 58 Tunnel Road
SWAN VIEW
SHIRE OF MUNDARING
LEGEND
Subject Area
Other Lots
Hydrant
Proposed Subdivision
Proposed Building Envelope
Proposed Carriageway
0 20 40 60 80 100
Metres
LOCALITY
SUBJECT SITE
Aerial Imagery : Landgate/SLIP
Image Date : Feb 2020
Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 17/06/2020
Map updated by: Ian 17/06/2020
BUSHFIRE PRONE PLANNING
Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
Map Document Path / Name: F:\Projects\Greg\180153 - BMP update Site Plan - Jun 2020\Mapping\MXD\180153_Fig1-1_DEV_Viveash_Rd_Swan_View.mxd

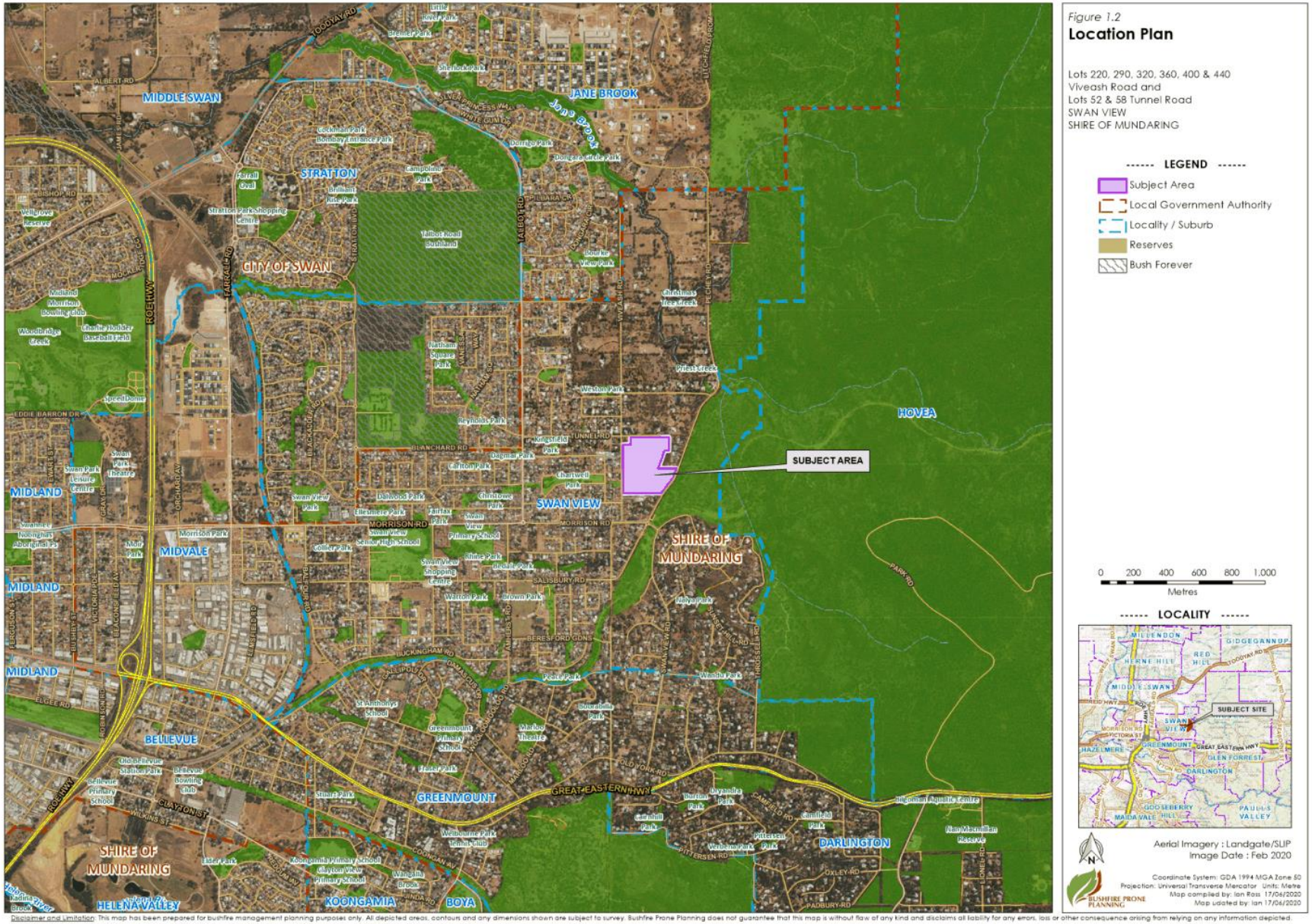
Figure 1.2
Location Plan
Lots 220, 290, 320, 360, 400 & 440
Viveash Road and
Lots 52 & 58 Tunnel Road
SWAN VIEW
SHIRE OF MUNDARING
LEGEND
Subject Area
Local Government Authority
Locality / Suburb
Reserves
Bush Forever
SUBJECT AREA
MIDDLE SWAN
JANE BROOK
STRATTON
CITY OF SWAN
HOVEA
MIDLAND
MIDVALE
SWAN VIEW
SHIRE OF MUNDARING
BELLEVUE
GREENMOUNT
DARLINGTON
KOONGAMIA
BOYA
HELENA VALLEY
0 200 400 600 800 1,000
Metres
LOCALITY
SUBJECT SITE
Aerial Imagery : Landgate/SLIP
Image Date : Feb 2020
Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 17/06/2020
Map updated by: Ian 17/06/2020
BUSHFIRE PRONE PLANNING
Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
Map Document Path / Name: F:\Projects\Greg\180153 - BMP update Site Plan - Jun 2020\Mapping\MXD\180153_Fig1-2_LOC_Viveash_Rd_Swan_View.mxd

Table 1.1.1: Details of Lots

CURRENT LOTS				
Lot	No.	Road/Street Name	Lot Area	Zoning
23	52-54	Tunnel Road	4001m²	Residential
103	68	Tunnel Road	21503m²	
27	440	Viveash Road	6023m²	
30	400	Viveash Road	4047m²	
29	360	Viveash Road	7955m²	
4	320	Viveash Road	2835m²	
PT: 350	290	Viveash Road	17806m²	
351	220	Viveash Road	25020m²	

PROPOSED LOTS					
Lot No.	Lot Area	Bushfire Prone Area	Lot No.	Lot Area	Bushfire Prone Area
1	2002m²	✓	13	2173m²	✓
2	2001m²	✓	14	2009m²	✓
3	2000m²	✓	15	2834m²	✓
4	1958m²	✓	16	5806m²	✓
5	4043m²	✓	17	2143m²	✓
6	4567m²	✓	18	4057m²	✓
7	4205m²	✓	19	2795m²	✓
8	4418m²	✓	20	3208m²	✓
9	4207m²	✓	21	1998m²	✓
10	2179m²	✓	22	2000m²	✓
11	2322m²	✓	23	2.15ha	✓
12	2143m²	✓	-	-	-

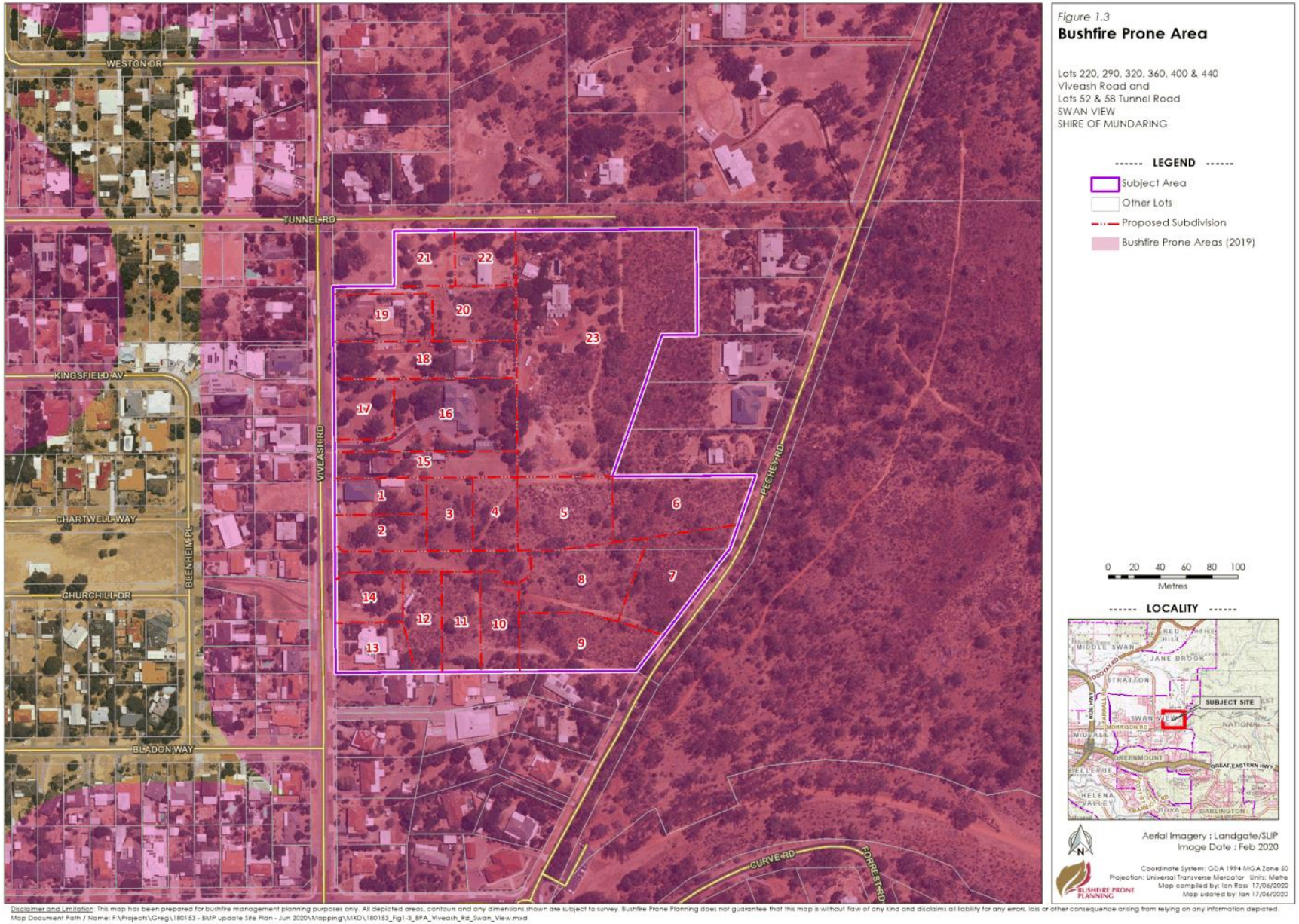
WESTON DR
TUNNEL RD
KINGSFIELD AV
VIVEASH RD
CHARTWELL WAY
BEENHEIM PL
CHURCHILL DR
BLADON WAY
PECHEY RD
CURVE RD
FORREST RD
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Figure 1.3
Bushfire Prone Area
Lots 220, 290, 320, 360, 400 & 440
Viveash Road and
Lots 52 & 58 Tunnel Road
SWAN VIEW
SHIRE OF MUNDARING
LEGEND
Subject Area
Other Lots
Proposed Subdivision
Bushfire Prone Areas (2019)
0 20 40 60 80 100
Metres
LOCALITY
SUBJECT SITE
Aerial Imagery : Landgate/SLIP
Image Date : Feb 2020
Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 17/06/2020
Map updated by: Ian 17/06/2020
BUSHFIRE PRONE PLANNING
Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
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1.2 Existing Documentation Relevant to the Construction of this Plan

This section acknowledges any known reports or plans that have been prepared for previous planning stages, that refer to the subject area and that may or will impact upon the assessment of bushfire risk and/or the implementation of bushfire protection measures and will be referenced in this Bushfire Management Plan.

RELEVANT DOCUMENTS		
Existing Document	Copy Provided by Client	Title
Structure Plan	Yes	Subdivision Concept 'D' - 26.09.2019
Environmental Report	Yes	Targeted Flora & Fauna Habitat Survey of Proposed Development in Swan View – 07.09.2019
Landscaping (Revegetation) Plan	N/A	-
Bushfire Risk Assessments	No	-

Landscaping (revegetation) within the Structure Plan area for future subdivision requires consideration of the bushfire management plan requirements to ensure an increase in bushfire hazards does not occur, nor alter bushfire attack levels determined for the site.

The environmental report prepared for the Structure Plan Area doesn't recommend additional revegetation across the site. The bushfire management plan will be required to address any future bushfire impacts arising from subsequent reports or plans.

2 Environmental Considerations

2.1 Native Vegetation – Modification and Clearing

'Guidelines' s2.3: "Many bushfire prone areas also have high biodiversity values. SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values."

Existing conservation areas that are potentially affected by the development proposal are required to be identified. This may result in vegetation removal/modification prohibition or limitations. These areas include National Parks, Nature Reserves, Wetlands and Bush Forever sites.

Environmental Protection Act 1986: "Clearing of native vegetation in Western Australia requires a clearing permit under Part V, Division 2 of the Act unless clearing is for an exempt purpose. Exemptions from requiring a clearing permit are contained in Schedule 6 of the Act or are prescribed in the Environmental Protection Regulations" ('Guidelines' s2.3).

The Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act): This Act administered by the Australian Government Department of Environment, provides a national scheme of environment and heritage protection and biodiversity conservation. Nationally threatened species and ecological communities are a specific matter of significance. Areas of vegetation can be classified as a Threatened Ecological Community (TEC) under the EPBC Act and consequently have removal restrictions imposed.

VEGETATION MODIFICATION AND CLEARING ASSESSMENT	
Will on-site clearing of native vegetation be required?	Yes
Does this have the potential to trigger environmental impact/referral requirements under State and Federal environmental legislation?	Yes
Identified environmental legislation applicable to the Proposal site - No.1:	N/A
Identified environmental legislation applicable to the Proposal site - No.2:	N/A
For the proposed development site, have any areas of native vegetation been identified as species that might result in the classification of the area as a Threatened Ecological Community (TEC)?	No
Potential TEC species identified:	N/A

The bushfire assessment and management strategies contained in this report, assume that environmental approval will be achieved or clearing permit exemptions will apply if applicable. The bushfire management plan to be prepared at the subdivision stage will consider any future identified vegetation modification constraints.

Development Design Options

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation Lots and/or Asset Protection Zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available design options to minimise the removal of native vegetation.

MINIMISING THE REMOVAL OF NATIVE VEGETATION		
Design Option	Identified	Adopted
Reduction of lot yield	Considered and the subdivision plan has been modified.	Yes
Cluster development	N/A	N/A
Construct building to a standard corresponding to a higher BAL rating as per BCA (AS 3959-2018 and/or NASH Standard)	N/A	N/A
Modify the development location	N/A	N/A

The subject area comprises existing developed land and portions within larger Lots of vegetation areas considered 'Good' to 'Very Good'. Future construction of buildings on the Lots will allow for the development of asset protection zones without the clearing of large areas of identified 'significant' vegetation. Lot design for the Structure Plan proposal and subsequent subdivision, has considered the potential for new buildings to be located in existing cleared areas or will minimise disturbance to native vegetation by limiting vegetation modification until the building development stage to achieve BAL-29. Development of asset protection zones (APZ's) **does not** require all vegetation to be cleared to mineral earth. APZ's require the responsible management by the landowner to maintain fuel loads to the levels prescribed in the BMP and as annually updated in the Shire of Mundaring Firebreak and Fuel Load Notice.

Impact on Adjoining Land

Is this planning proposal able to implement the required bushfire measures within the boundaries of the land being developed so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants?	**Yes**

The structure plan is not reliant upon bushfire measures being implemented external to the site to achieve compliance with bushfire protection criteria. The future subdivision stages can achieve asset protection zone development and maintenance of vegetation on each Lot in a low threat state, which will ensure the bushfire risk will be reduced to the immediate surrounding properties due to the continued ongoing management of vegetation, on each newly created Lot.

Compliance is regulated via the bushfire management plan for the site and the Shire of Mundaring annual bushfire management requirements (Firebreak Notice). Bushfire management measures external to the site are not required as part of this proposal.

2.2 Re-vegetation / Retained Vegetation / Landscape Plans

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
Is the requirement for ongoing maintenance of existing vegetation in riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No

In assessing vegetation for bushfire threat, consideration must be given to possible future vegetation changes likely on the site that is being assessed and in particular those that would have the potential to increase the bushfire risk. This may be due to growth of existing vegetation or growth of planned landscape plantings. There must be careful consideration of the creation of vegetation corridors where they join offsite vegetation, and which may provide a route for fire to enter an area of future development.

Where an environmental report or landscaping (revegetation) is required as a condition of future development, the bushfire management planning may be required to address any bushfire impacts arising from these subsequent reports or plans.

Landscaping within the site requires consideration of the bushfire management planning requirements to ensure an increase in bushfire hazards does not occur, nor alter bushfire attack levels determined for the site

All onsite landscape planting within asset protection zones is to be managed in a low threat state as per the criteria detailed in AS3959-2018 s2.2.3(f) 'Low threat vegetation' and all other vegetation managed in accordance with the annual Shire of Mundaring Firebreak and Fuel Load Notice (Firebreak Notice). This ensures BAL separation distances can be effectively maintained and bushfire hazards on-site are effectively reduced.

2.3 Shire of Mundaring – Local Natural Areas (LNA)

The Shire of Mundaring has a Local Biodiversity Strategy that requires natural areas should be conserved, protected or retained wherever practicable to maintain the Shire's current levels of biodiversity, unless the area is already committed to development through zoning. To achieve this intention formal protection is put in place through the Local Planning Strategy and the Town Planning Scheme 4 which specify controls and recommendations relating to each of these categories.

Protection Levels

Based on consideration of a range of factors including land tenure, specific purpose of Crown reserves, existing Lot sizes, subdivision potential and relative conservation priority, LNA's in the Shire have been assigned a Protection Level. The subject Structure Plan Area LNA Protection Level is indicated in the table below.

LOCAL NATURAL AREA (LNA) - PROTECTION LEVEL	
Map Shading	Level
Beige	Limited Protection – already committed by zoning

The Shire of Mundaring's LNA mapping shows the level of protection on the subject site is considered to be 'Limited Protection – already committed by zoning' category. No other protection levels are identified on the site.

Conservation Priorities

To assist in with making decisions on planning proposals affecting LNA's and the allocation of resources to managing them, conservation priorities have been determined. LNA's are identified as having one of three conservation priorities (P1, P2 or P3) based on a range of ecological values as shown below.

DETERMINATION OF CONSERVATION PRIORITIES – LOCAL NATURAL AREA (LNA)
(refer to Shire of Mundaring Local Biodiversity Strategy and Local Planning Strategy)

Map Shading	Priority	Intention	Conservation Assets
Green	1	To be conserved or protected and receive active management	Rare vegetation complexes At risk vegetation complexes Within 20 m of a watercourse Regional linkage over special features Regional linkage over habituate
Brown	2	To be conserved or protected and receive active management	Habitat Special features Regional linkages Within 20-50m off watercourse
Yellow	3	To be retained and where possible receive active management	Every other LNA

Assessment Result

Has the subject lot been identified as being subject to a Local Natural Area	Yes

The Structure Plan area includes an area of approximately 4.9ha of native vegetation that has been determined as 'Limited Protection' – 'Category 3' for the majority of this area, with small portion of 'Category 1 and 2' identified under the Shire of Mundaring's Local Natural Area strategy. (Refer Figures 2.2 and 2.3)

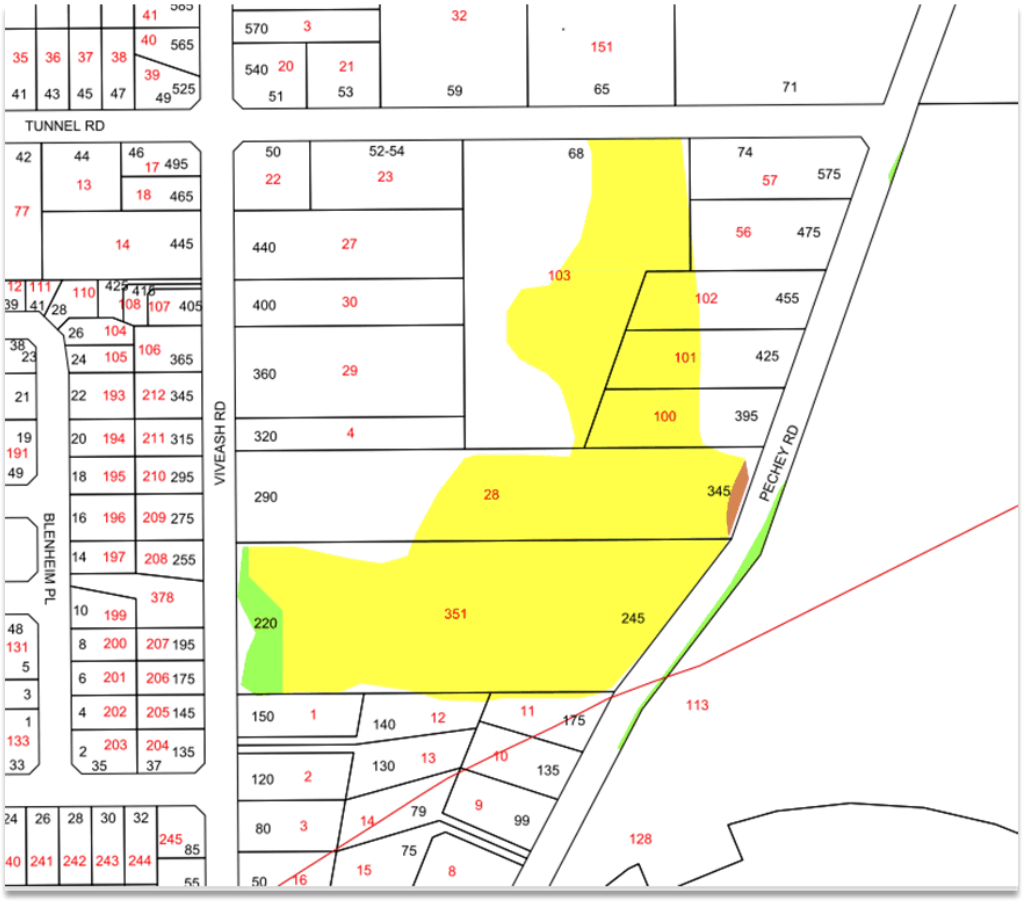
Mapping (Screen Shot)

The following screen shots show the current Protection Levels and Conservation Priorities for the identified Local Natural Areas on the subject site of this Proposal.

There are significant areas of existing vegetation on the subject Lot classified as a Local Natural Area (LNA). Approval will be required from the Shire of Mundaring prior to any native vegetation clearing.

Figure 2.2: LNA Protection category (Source: Shire of Mundaring Intramaps)

Figure 2.3: LNA Conservation priority (Source: Shire of Mundaring Intramaps)



3 Potential Bushfire Impact Assessment

3.1 Assessment Input

3.1.1 Fire Danger Index (FDI) Applied

AS 3959-2018 specifies the fire danger index values to apply for different regions as per Table 2.1. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be refined if appropriately justified.

Table 3.1.1: Applied FDI Value

FDI Value			
Vegetation Area	As per AS 3959 - 2018 Table 2.1	As per DFES for the Location	Value Applied
1 to 7	80	N/A	80

Existing Vegetation Identification, Classification and Effective Slope

Vegetation identification and classification has been conducted in accordance with AS 3959-2018 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately with the worst-case scenario being applied as the classification. The predominant vegetation is not necessarily the worst-case scenario.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959-2018 s2.2.3.2(f) and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

Effective Slope: Is the ground slope under the classified vegetation and is determined for each area of classified vegetation. It is the measured or determined slope which will most significantly influence the bushfire behaviour in that vegetation as it approaches a building or site. Where there is a significant change in effective ground slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified, based on the change in effective slope, to enable the correct assessment.

Table 3.1.2: Vegetation identification and classification

ALL VEGETATION WITHIN 150 METRES OF THE LOT				
Vegetation Area	Identified Classification Types [1] or Description if 'Excluded'	Applied Classification[2]	Effective Slope Under Classified Vegetation	
			degrees	description
1	Open Heath C-11 (Shrubland dominant mixed species comprising low to medium height shrubs up to 2m in height. Pockets of native Marri trees.)	Class C Shrubland	0	Upslope
1	Open Heath C-11 (Shrubland dominant mixed species comprising low to medium height shrubs up to 2m in height. Pockets of native Marri trees.)	Class C Shrubland	6.0	Downslope
1	Open Heath C-11 (Shrubland dominant mixed species comprising low to medium height shrubs up to 2m in height. Pockets of native Marri trees.)	Class C Shrubland	12.9	Downslope
2	Open Forest – A-03 (Marri trees, 30% foliage cover with low to medium height shrubs)	Class A Forest	0	Upslope
2	Open Forest – A-03 (Marri trees, 30% foliage cover with low to medium height shrubs)	Class A Forest	3.9	Downslope
3	Sown Pasture G-26 (Pockets of Flooded Gum trees with predominant grass understorey)	Class G Grassland	6.6	Downslope
4	Open Heath C-11 (Shrubland dominant mixed species comprising low to medium height shrubs up to 2m in height. Pockets/strips of native Marri trees – <10% Forest areas.)	Class C Shrubland	9.4	Downslope
5	Sown Pasture G-26 (Grass paddock area and cleared land/grassy understorey, ornamental shade trees and shrubs)	Class G Grassland	8.8	Downslope
6	Area to be modified to Non-vegetated Area & Low Threat Vegetation – Post Subdivision	Excluded AS3959-2018 2.2.3.2 (e)(f)	N/A	N/A
7	Excludable Area – Existing Residential built out area, roads, buildings, footpaths, maintained gardens and lawns	Excluded AS3959-2018 2.2.3.2 (e)(f)	N/A	N/A

Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on the topography and classified vegetation map, Figure 3.1.

Note[1]: As per AS 3959-2018 Table 2.3 and Figures 2.4(A)and 2.4 A-G
Note[2]: As per AS 3959-2018 Table 2.3.

- It is assumed for the purposes of the strategic level assessment that **Area 6** (Subject Structure Plan Area) will be modified to low threat as part of future subdivision works and ongoing management in a low threat state in perpetuity.

Vegetation Area 1	**Classification Applied or Exclusion Clause:** Class C Shrubland ; Class A Forest
Vegetation Type Present: Open heath C-11 ; Open forest A-03	
Description / Classification Justification: Marri dominant canopy trees confined to small pockets within shrubland. Low and medium height shrub mixed species. Tree height 12.0m to ~18.0m, tree foliage cover 10%, shrub height up to 2m, foliage cover >30%.	

Photo ID: 1

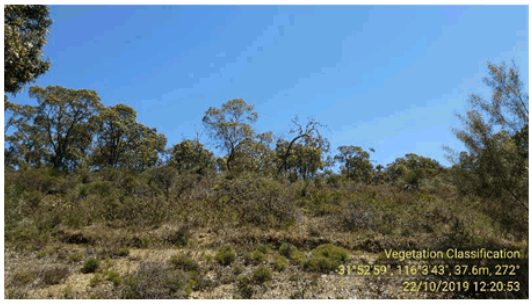


Photo ID: 2

Vegetation Area 2	**Classification Applied or Exclusion Clause:** Class C Shrubland ; Class A Forest
Vegetation Type Present: Open heath C-11 ; Open forest A-03	
Description / Classification Justification: Marri dominant canopy trees, low to medium height shrub mixed species understorey. Tree height 12.0m to ~20.0m, foliage cover ~30%. Shrub height up to 2m, foliage cover >30%.	

Photo ID: 3

Photo ID: 4

Vegetation Area 2	**Classification Applied or Exclusion Clause:** Class A Forest
Vegetation Type Present: Open forest A-03	
Description / Classification Justification: Marri dominant canopy trees, low to medium height shrub mixed species understorey. Tree height 12.0m to ~20.0m, foliage cover ~40%.	

Photo ID: 5

Photo ID: 6

Vegetation Area 3	**Classification Applied or Exclusion Clause:** Class G Grassland
Vegetation Type Present: Sown pasture G-26	
Description / Classification Justification: Mixed pasture grasses, <10% tree foliage cover within paddock areas. Flooded Gum canopy trees. Tree height 12.0m to ~18.0m, foliage cover ~10%. Grassland dominant resulting from clearing of vegetation.	

Photo ID: 7

Photo ID: 8

Vegetation Area 4	**Classification Applied or Exclusion Clause:** Class C Shrubland ; Class A Forest
Vegetation Type Present: Open heath C-11 ; Open forest A-03	
Description / Classification Justification: Marri dominant canopy trees, low to medium height shrub mixed species understorey. Tree height 12.0m to ~20.0m, foliage cover ~10%. Shrub height up to 2m, foliage cover ~40%. Remnant pockets of trees with some of the Lots. Predominantly shrubland in the wider undeveloped area.	

Photo ID: 9

Photo ID: 10

Vegetation Area 4	**Classification Applied or Exclusion Clause:** Class C Shrubland
Vegetation Type Present: Open heath C-11	
Description / Classification Justification: Low to medium height shrub mixed species understorey. Shrub height up to 2m, foliage cover ~40%. Remnant pockets of trees with some of the Lots. Predominantly shrubland in the wider undeveloped area.	

Photo ID: 11

Photo ID: -

Vegetation Area 5	**Classification Applied or Exclusion Clause:** Class G Grassland
Vegetation Type Present: Sown pasture G-26	
Description / Classification Justification: Mixed pasture grasses, <10% tree foliage cover within paddock areas and vacant Lots. Ornamental shade trees, residual native trees, some shrubs and mown verges.	

Photo ID: 12

Photo ID: 13

Vegetation Area 6	**Classification Applied or Exclusion Clause:** Class A Forest ; Class G Grassland
Vegetation Type Present: Open forest A-03 ; Sown pasture G-26	
Description / Classification Justification: Marri dominant canopy trees, some Wandoo/White Gum, low to medium height shrub mixed species understorey. Tree height 10.0m to ~25.0m, foliage cover ~30%. Mixed pasture grasses, <10% tree foliage cover within paddock areas. Managed residential properties, roads, buildings, ornamental shade trees and mown verges within this area. ***NOTE: This 'Area' to be modified to Low Threat Vegetation and Non-vegetated area post subdivision works (Roads, residential Lots and managed land).***	

Photo ID: 14

Photo ID: 15

Vegetation Area 7	**Classification Applied or Exclusion Clause:** Excluded AS3959-2009 2.2.3.2 (e)(f)
Vegetation Type Present: Non-vegetated Areas & Low Threat Vegetation	
Description / Classification Justification: Managed residential properties, roads, buildings, ornamental shade trees and mown verges.	

Photo ID: 16

Photo ID: 17

Vegetation Area 7	**Classification Applied or Exclusion Clause:** Excluded AS3959-2009 2.2.3.2 (e)(f)
Vegetation Type Present: Non-vegetated Areas & Low Threat Vegetation	
Description / Classification Justification: Managed residential properties, roads, buildings, ornamental shade trees and mown verges.	

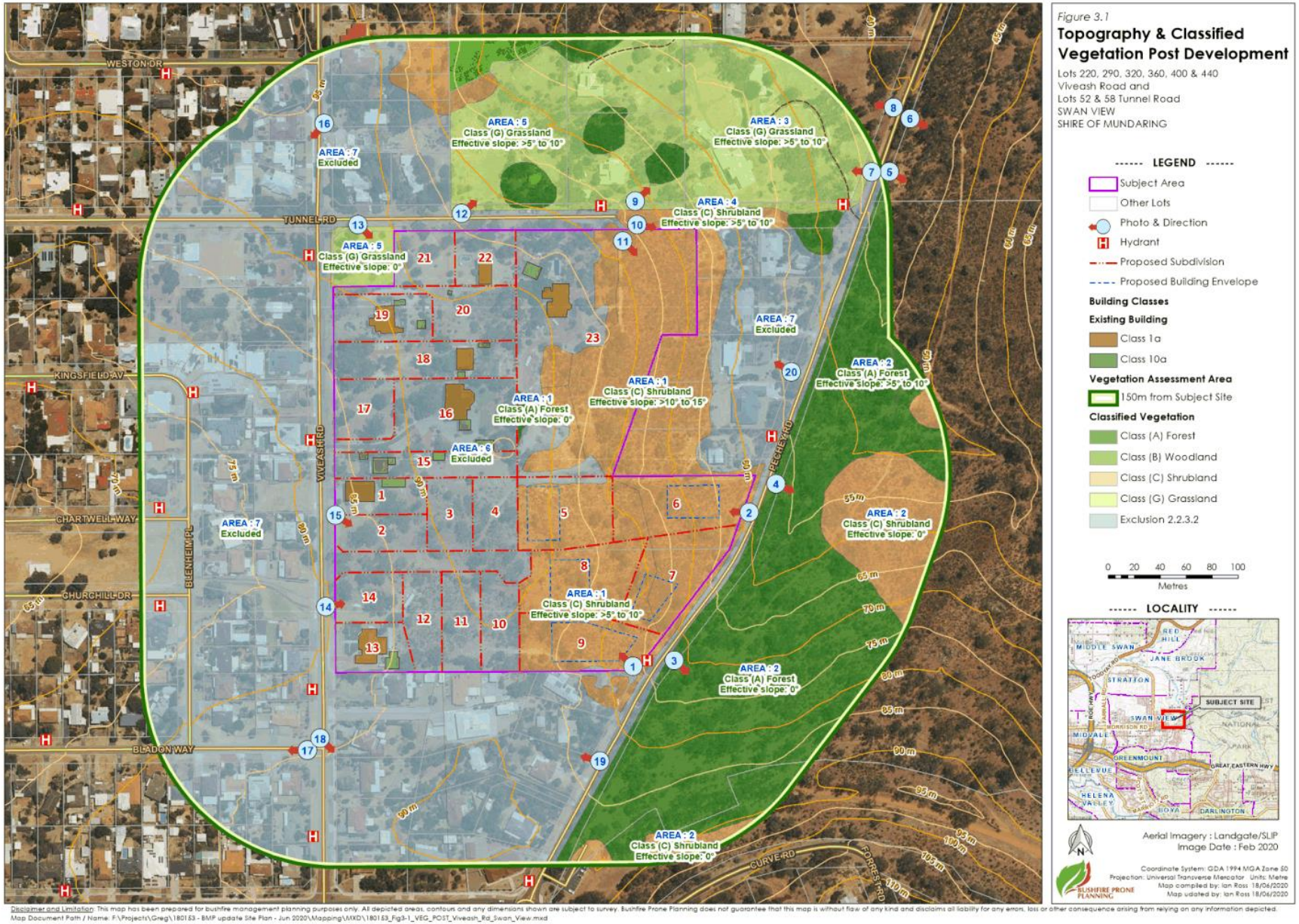
Photo ID: 18

Photo ID: 19

Vegetation Area 7	**Classification Applied or Exclusion Clause:** Excluded AS3959-2009 2.2.3.2 (e)(f)
Vegetation Type Present: Non-vegetated Areas & Low Threat Vegetation	
Description / Classification Justification: Managed residential properties, roads, buildings, ornamental shade trees and mown verges.	

Photo ID: 20

Photo ID: -



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3.2 Assessment Output

Understanding the Bushfire Assessment Results - Application of Bushfire Attack Levels (BAL)

The BAL rating has a different application in the building environment compared to the planning environment and the BAL assessment can result in a determined BAL or an indicative BAL which have different implications.

Building versus Planning Applications

In the building environment, a determined BAL rating is required (for the proposed construction) at the building application stage. This is to inform approval considerations and establish the construction standards that are to apply if approved. An indicative BAL rating is not acceptable for a building application.

In the planning environment, assessing the ability of a proposed development site to achieve BAL-29 or less is the objective (as one of the bushfire protection criteria being assessed). The 'development site' is defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed".

Therefore, being able to show that a BAL rating of BAL-29 or lower is achievable for a proposed development site (i.e. the building footprint) is an acceptable outcome for that criteria, as established by the bushfire provisions, SPP 3.7 and the associated Guidelines. For planning purposes, this BAL rating could be either indicative or determined.

Determined BAL Ratings

A determined BAL rating is to apply to an existing or proposed construction site (building) and not to a lot or envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed.

A determined BAL cannot be given for a future building whose location, elevation design and footprint (on a given lot) are unknown. It is not until these variables have been fixed that a BAL can be determined (typically at the development application or building application stage).

The one exception is when a building of ***any dimension*** can be ***positioned anywhere*** on a proposed lot or within defined limits within the lot (i.e. building setbacks or building envelope) and always remain subject to the same BAL rating. For this to be the case, there needs to be no classified vegetation either onsite or offsite that if retained could impact upon the determined BAL rating.

Indicative BAL Ratings

When this Plan presents a single indicative BAL rating for a proposed construction site (building), this will be because the construction is still subject to a location within the lot being confirmed and/or a vegetation separation distance being achieved. That is, it will be conditional upon some factor being confirmed at a later stage.

For planning applications associated with proposed lots, the building location, elevation design and footprint have typically not been established. Therefore, indicative rather than determined BAL rating/s will be presented for each lot (with the exception as noted above under 'Determined BAL Ratings').

When this Plan presents a single indicative BAL rating for a lot or building envelope (i.e. an 'area' that is not a located building footprint) it will represent the highest BAL rating affecting that 'area'. The BAL rating of a future building on that 'area' will be dependent on its eventual location.

Otherwise, this Plan will present all BAL ratings for each lot and for each BAL rating, the vegetation separation distances from each area of classified vegetation that are to apply. These distances will be presented as either figures in a table or as a BAL contour map.

From this indicative BAL information, it can be assessed if acceptable BAL ratings (≤ BAL-29) can be achieved for future buildings.

3.2.1 Indicative BAL Results Presented as BAL Contour Map

Interpretation of the Bushfire Attack Level (BAL) Contour Map

The contour map will present different coloured contour intervals constructed around the classified bushfire prone vegetation. These represent the different Bushfire Attack Levels that exist at varying distances away from the classified vegetation. Each BAL represents a set range of radiant heat flux (as defined by AS 3959-2018) that can be generated by the bushfire in that vegetation at that location.

The width of each shaded contour (i.e. the distance interval) will vary and is determined by consideration of variables including vegetation type, fuel structure, ground slope, climatic conditions. They are unique to a site and can vary across a site. The width of each contour is a diagrammatic expression of the separation distances from the classified vegetation that apply for each BAL rating, for that site. A building (or 'area') located within any given BAL contour will be subject to that BAL rating and potentially multiple BAL ratings of which the highest rating will be applied in most instances.

3.2.2 Separation Distances Calculated to Construct the BAL Contours

Table 3.2.2: Vegetation separation distances applied to construct the BAL contours.

CALCULATED VEGETATION SEPARATION DISTANCES										
Vegetation Area	Vegetation Classification	Effective Slope	Site Slope (Degrees)	BAL Assessment Method Applied[1]	BAL Rating and Corresponding Separation Distance [2] (metres)					
					BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW
1	Class C Shrubland	U/S	0	Method 1	<7	7-<9	9-<13	13-<19	19-<100	>100
1	Class C Shrubland	D/S	6.0	Method 1	<8	8-<11	11-<17	17-<25	25-<100	>100
1	Class C Shrubland	D/S	12.9	Method 1	<9	9-<13	13-<19	19-<28	28-<100	>100
2	Class A Forest	U/S	0	Method 1	<16	16-<21	21-<31	31-<42	42-<100	>100
2	Class A Forest	D/S	3.9	Method 1	<20	20-<27	27-<37	37-<50	50-<100	>100
3	Class G Grassland	D/S	6.6	Method 1	<8	8-<10	10-<16	16-<23	23-<50	>50
4	Class C Shrubland	D/S	9.4	Method 1	<8	8-<11	11-<17	17-<25	25-<100	>100

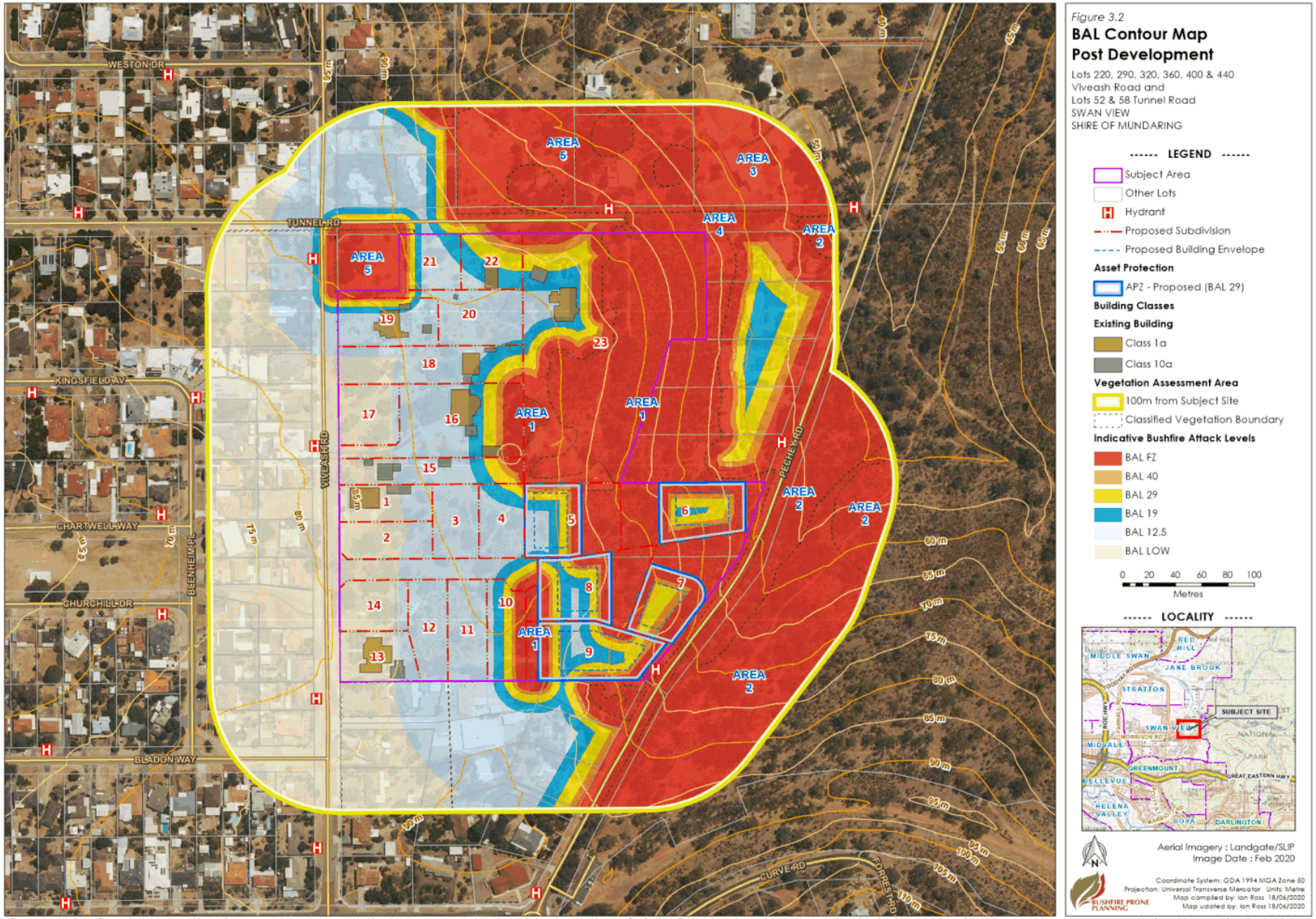
5	Class G Grassland	D/S	8.8	Method 1	<8	8-<10	10-<16	16-<23	23-<50	>50
6	Excluded AS3959-2018 2.2.3.2 (e)(f)	N/A	-	Method 1	-	-	-	-	-	-
7	Excluded AS3959-2018 2.2.3.2 (e)(f)	N/A	-	Method 1	-	-	-	-	-	-

[1] Method 1 as per AS 3959-2018 Table 2.5 and Method 2 as per AS 3959-2018 Appendix B. The input variables applied, other than the calculation model defaults, are presented in Section 3.1 of this Plan.
[2] Copies of the summaries of Method 2 calculation inputs and outputs are presented in the Appendices if applicable.

D/S = Downslope U/S = Upslope

Note: Area 6 (Subject Structure Plan Area) is excludable for the purposes of the Vegetation & Topography Map and the BAL Contour map, due to the intended modification of the vegetation to a low threat state. Further site-specific BAL assessment may be required at the future subdivision and/or building stage to confirm or determine the BAL rating dependent upon site conditions and extent of subdivision at that time.

Area 7 is existing developed Residential area, comprising non-vegetated areas and low threat vegetation.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VIVEASH RD
PECHEY RD
CURVE RD
FORREST RD
AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
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22
23
Figure 3.2
BAL Contour Map
Post Development
Lots 220, 290, 320, 360, 400 & 440
Viveash Road and
Lots 52 & 58 Tunnel Road
SWAN VIEW
SHIRE OF MUNDARING
LEGEND
Subject Area
Other Lots
Hydrant
Proposed Subdivision
Proposed Building Envelope
Asset Protection
APZ - Proposed (BAL 29)
Building Classes
Existing Building
Class 1a
Class 10a
Vegetation Assessment Area
100m from Subject Site
Classified Vegetation Boundary
Indicative Bushfire Attack Levels
BAL FZ
BAL 40
BAL 29
BAL 19
BAL 12.5
BAL LOW
0 20 40 60 80 100
Metres
LOCALITY
SUBJECT SITE
Aerial Imagery : Landgate/SLIP
Image Date : Feb 2020
Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 18/06/2020
Map updated by: Ian Ross 18/06/2020
BUSHFIRE PRONE PLANNING
Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
Map Document Path / Name: F:\Projects\Greg\180153 - BMP update Site Plan - Jun 2020\Mapping\MXD\180153_Fig3-2_BAL_POST_Viveash_Rd_Swan_View.mxd

3.2.3 Bushfire Attack Levels (BAL) Derived from the Contour Map

Deriving a BAL Rating for a Future Construction Site (Building) from the BAL Contour Map Data

(Capacity to Issue a BAL Certificate)

Key Assumptions: The actual location of a building within a lot or envelope (an 'area') may not have been determined at this stage of planning; and the BAL ratings represent the BAL of an 'area' not a building.

The BAL Rating is Assessed as Indicative

If the assessed BAL for the 'area' is stated as being 'indicative', it is because that 'area' is impacted by more than one BAL contour interval and/or classifiable vegetation remains on the lot, or on adjacent lots, that can influence a future building's BAL rating (and this vegetation may have been omitted from being contoured for planning purposes e.g. Grassland or when the assumption is made that all onsite vegetation can be removed and/or modified).

In this report the indicative BAL is presented as either the highest BAL impacting the site or as a range of achievable BAL's within the site – whichever is the most appropriate.

The BAL rating that will apply to any future building within that 'area' will be dependent on:

1. vegetation management onsite; and/or
2. vegetation remaining on adjacent lots; and/or
3. the actual location of the future building within that 'area'.

A BAL Certificate cannot be provided for future buildings, within a lot or envelope with an indicative BAL, until the building location and in some instances building design (elevation), have been established and any required and approved vegetation modification/removal has been confirmed. Once this has occurred a report confirming the building location and BAL rating will be required to submit with the BAL certificate.

The required confirmation of the BAL rating must be done by a bushfire practitioner with the same level of accreditation as has been required to compile this Bushfire Management Plan. This is dependent on the type of calculations utilised (e.g. if performance-based solutions have been used in the Plan BPAD Level 3 accreditation is required)

The BAL Rating is Assessed as Determined

If the assessed BAL for the lot or envelope is stated as being 'determined' it is because that lot or envelope is impacted by a single BAL contour interval. This BAL has been determined by the existence (or non-existence) of classified vegetation outside the lot or envelope, and no classifiable vegetation currently exists on the lot or envelope (i.e. it has been cleared to a minimal fuel, low bushfire threat state). In the situation where the BAL Contour Map has been constructed around multiple lots, there also needs to no classifiable vegetation on an adjacent lot if this vegetation has not already been incorporated into the creation of the BAL Contour Map.

As a result, a determined BAL can be provided in this limited situation because:

1. No classified vegetation is required to be removed or modified to achieve the determined BAL, either within the lot/envelope or on adjacent lots (or if vegetation is excluded from classification, it is reasonable to assume it will be maintained in this state into the future); and
2. A future building can be located anywhere within the 'site' and be subject to the determined BAL rating; and
3. The degree of certainty is more than sufficient to allow for any small discrepancy that might occur in the mapping of the BAL contours.

For a determined BAL rating for a lot/envelope, A BAL Certificate (referring to this BMP) can be provided for a future building, if the BMP remains current.

4 Identification of Bushfire Hazard Issues

This bushfire planning assessment is required to show that the Bushfire Protection Criteria can be complied with in the future. The intent is to ensure future development is located where the bushfire hazard level is (or will on completion be) moderate or low and subject to a maximum Bushfire Attack Level of BAL-29.

The assumption used to facilitate the determining of Indicative Bushfire Attack Levels in the Proposed Structure Plan Area is that vegetation **onsite** is under the control of the landowner/s and therefore can be removed or modified to present a low bushfire threat (Note: any proposed vegetation removal may be subject to local government approval, dependent on the lot's specific situation with respect to identified environmental protection areas and the lot size).

This can be achieved for this site due to the separation distances required for the appropriate BAL rating that considers the following:

Onsite Vegetation: The key factor to facilitate the determining of Indicative Bushfire Attack Levels for the proposed Lots is that vegetation onsite is under the control of the landowner/s. Vegetation onsite therefore can potentially be removed or modified to lower the bushfire risk and therefore presents a low bushfire threat.

The BAL Contour Map, Figure 3.2, indicates post development bushfire attack levels for the strategic planning proposal (Structure Plan) based on the assumptions above and the implementation of asset protection zones with the larger Lots around the proposed building envelopes to achieve a minimum of BAL-29 within the building envelope.

The extent of vegetation that will be modified or cleared will depend upon locations of future buildings within the Lot. The Shire of Mundaring may condition as part of future subdivision that the modification or clearing of vegetation for the construction of asset protection zones is not to be undertaken until the building locations are determined, to limit unnecessary vegetation disturbance. Subsequently, the bushfire management plan for subdivision stages may be required to acknowledge the limitations on clearing within the Lots until the building stage.

Offsite Vegetation: Areas of vegetation offsite that form part of native vegetation road reserves, heritage trails and neighbouring private land, cannot be removed or modified and as a result the assessed BAL's determined by the proximity of this vegetation are unable to be further reduced. These areas external to the site but not part of the future development have been factored for the BAL Contour mapping.

5 Assessment Against the Bushfire Protection Criteria (BPC)

5.1 Bushfire Protection Criteria - Assessment Summary

Summarised Outcome of the Assessment Against the Bushfire Protection Criteria (BPC)

Element	Basis for the Assessment of Achieving the Intent of the Element			
	Achieves compliance with the Element through meeting Acceptable Solutions		Achieves compliance with the Element by application of a Performance Based Solution	Minor or Unavoidable Development
	Meets all relevant acceptable solutions	One or more relevant Acceptable Solutions are not fully met. A variation of the solution is provided and justified.	One or more applicable Acceptable Solutions are not met. A solution is developed with the summary presented in this Plan in Section 5.5. The supporting document presenting Bushfire Prone Planning's detailed methodology is submitted separately to the decision makers.	The required supporting statements are presented in this Plan.
Location	✓			N/A
Siting and Design of Development	✓			
Vehicular Access		✓		
Water	✓			

The subject site has been assessed against:

1. The requirements established in Appendix 4 of the Guidelines for Planning in Bushfire Prone Areas, WAPC 2017 v1.3 (the 'Guidelines'). The detail, including technical construction requirements, are found at https://www.dplh.wa.gov.au/8194.aspx. A summary of relevant information is provided in the appendices of this Plan; and

2. Any endorsed variations to the Guideline's acceptable solutions and associated technical requirements that have been established by the relevant local government. If known and applicable these have been stated in Section 5.2 of this Plan with the detail included as an appendix if required by the relevant local government.

5.2 Bushfire Protection Criteria – Acceptable Solutions Assessment Detail

5.2.1 Element 1: Location

Bushfire Protection Criteria Element 1: Location Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.			
Acceptable Solution:	A1.1: Development Location	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution can be fully met in the future.

The subject site can achieve compliance by:

- By ensuring future building work on each proposed Lot can be located on an area that will be subject to potential radiant heat from a bushfire not exceeding 29 kW/m² (i.e. a BAL rating of BAL-29 or less will apply – refer Figure 3.2: BAL Contour Map). This can be achieved by using positioning, design and appropriate on-site vegetation management; and
- Managing the remaining bushfire risk to an acceptable level by the existence/implementation and ongoing maintenance of all required bushfire protection measure. These measures include the requirements for vegetation management, vehicular access and fire-fighting water supply.

5.2.2 Element 2: Siting and Design of Development

Bushfire Protection Criteria Element 2: Siting and Design of Development Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure that the siting and design of development (note: not building/construction design) minimises the level of bushfire impact.			
Acceptable Solution:	A2.1: Asset Protection Zone	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution can be fully met in the future (at the subdivision stage).

The subject site achieves compliance by:

- Ensuring future building work on each Lot can have established around it an APZ of the required dimensions - to ensure that the potential radiant heat from a bushfire to impact future building/s, does not exceed 29 kW/m² (i.e. a BAL rating of BAL-29 or less will apply to determine building construction standards);
- The APZ/s can be established within the Lot boundaries for the larger proposed Lots and across boundaries in the higher density Lots, where it can be reasonably expected that these Residential Lots will be maintained in a low threat state, in perpetuity;
- The landowner/s having the responsibility of continuing to manage the required APZ as low threat vegetation in a minimal fuel state, by maintaining the APZ to the required dimensions and standard, including compliance with the local government's annual firebreak notice for APZ construction and management of land outside of the APZ, within each Lot (Compliance with the BMP and Firebreak and Fuel Load Notice).

The required APZ dimensions are set out in Section 5.3.1. The APZ technical requirements (Standards) are detailed in Appendix 1.

5.2.3 Element 3: Vehicular Access

Bushfire Protection Criteria Element 3: Vehicular Access Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.			
Acceptable Solution:	A3.1: Two access routes	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution is fully met.
The Structure Plan area has Lots that have frontage to Viveash Road and Lots that access Pechey Road. Both of these roads provide safe access and egress to two different destinations via local road networks. As sealed public roads, they are available to all residents and the public at all times and under all weather conditions. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.			
Acceptable Solution:	A3.2 Public Road	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution is fully met.
Vivieash Road and Pechey Road are existing constructed roads that meet the Shire of Mundaring standards and specifications for public roads. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.			
Acceptable Solution:	A3.3 Cul-de-sacs (including a dead-end road)	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution is mostly met. A variation is justified.
Tunnel Road is an existing no through road servicing existing Lots. The total length of the constructed portion of Tunnel Road exceeds the recommended 200m length for a cul-de-sac or dead-end road (the sealed portion of Tunnel Road is 225m in length) . Tunnel Road contains an unmade section of road reserve that connects with Pechey Road to the east. An extension of Tunnel Road is not planned as part of the Structure Plan proposal. Vehicles exiting the furthermost Lot as part of this Structure Plan proposal on Tunnel Road can access a point where two different destinations are available within 205m. It is recommended that the current cul-de-sac head, created by the Tunnel Road termination point, be upgraded to meet the technical requirements established by the Guidelines and/or the local government, to increase the capacity for large fire appliances to turn-around without restriction. The proposed cul-de-sac which will connect to Viveash Road will comply with the technical requirements and will fully meet the acceptable solution. This cul-de-sac considers the site constraints and the future driveway access ability to proposed Lots 5, 7 and 8, where topography is more favourable for driveway construction and access to potential building sites. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.			

Bushfire Protection Criteria Element 3: Vehicular Access (continued) Assessment Statements and Bushfire Protection Measures to be Applied			
Acceptable Solution:	A3.4: Battle-axe	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution can be fully met in the future (at the subdivision stage).
The Structure Plan proposal encompasses an area where existing dwellings and structures will be retained. The design for the future subdivision therefore must consider the retention of existing dwellings and associated infrastructure. Battle-axe Lot design has been implemented to overcome the constraints imposed by existing dwellings throughout the Structure Plan area. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.			
Acceptable Solution:	A3.5: Private Driveways	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met in the future (building construction stage).
Future development on each Lot will require increased construction standards for driveways for any future buildings being greater than 50m from the public road, including provision for turn-around areas and passing bays where required, as specified in the Guidelines. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.			
Acceptable Solution:	A3.6 Emergency Access Way	Method of achieving Element compliance and/or the Intent of the Element:	N/A
N/A			
Acceptable Solution:	A3.7 Fire Service Access Routes	Method of achieving Element compliance and/or the Intent of the Element:	N/A
N/A			
Acceptable Solution:	A3.8 Firebreak Width	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution can be fully met in the future (at the subdivision construction stage).
The subject site will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954. Firebreaks and hazard reduction, as necessary, will be installed/maintained annually and in perpetuity. Each Lot will have firebreaks constructed as part of the subdivision works by the developer and maintained by landowner/s. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.			

5.2.4 Element 4: Water

Bushfire Protection Criteria Element 4: Water Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.			
Acceptable Solution:	A4.1 Reticulated Areas	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution can be fully met in the future (at the subdivision construction stage).
A reticulated water supply is available to the subject site and hydrants are located at the required regular intervals. The developer will install a new hydrant within the proposed cul-de-sac road reserve. (or location as determined by the Water Corporation and/or Shire of Mundaring) to ensure all new Lots are with 200m of a hydrant for fire-fighting operations. (State required hydrant separation distances – 100m commercial, 200m residential, 400m rural residential >1ha). The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.			
Acceptable Solution:	A4.2 Non-Reticulated Areas	Method of achieving Element compliance and/or the Intent of the Element:	N/A
N/A			
Acceptable Solution:	A4.3 Non-reticulated Areas (Individual Lots)	Method of achieving Element compliance and/or the Intent of the Element:	N/A
N/A			

5.3 Additional Information for Required Bushfire Protection Measures

The Structure Plan Area is currently and will be required in the future for proposed subdivision to be maintained in accordance with the Shire of Mundaring 'Firebreak and Fuel Load Notice 'Firebreak Notice'. The Notice specifies hazard reduction requirements and Asset Protection Zone detail. Note: This Notice may be subject to change in the future.

5.3.1 Vegetation Management

Vegetation management outside of asset protection zones (to achieve the indicated BAL rating) other than that described in the Shire of Mundaring Firebreak and Fuel Load Notice 'Firebreak Notice' is not required for the subject site. The minimum dimensions (vegetation separation distances) that are to apply to the APZ for this Proposal are presented in the table below.

Asset Protection Zone (APZ) Dimensions that are to Apply

The required dimensions of the APZ will vary dependent upon the purpose for which the APZ has been defined. There are effectively three APZ dimensions that can apply:

1. An application for planning approval will be required to show that an APZ can be created which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29); and
2. If the assessment has determined a BAL rating for an existing or future building is less than BAL-29, the APZ must be of sufficient size to ensure the potential radiant heat impact of a fire does not exceed the kW/m² corresponding to the lower assessed BAL rating; or
3. Complying with the relevant local government's annual firebreak notice may require an APZ of greater size than that defined by the two previous parameters.

The 'Planning (WAPC) BAL-29' APZ

Minimum Required Dimensions for the Subject Site (Structure Plan Area)

Requirement Set By	Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 v1.3)			
Relevant Fire Danger Index (AS3959-2018 Table 2.1)				80
BAL Determination Method	Method 1 (as per AS 3959-2018 s2.2.6 and Table 2.5)			
Vegetation Area	Applied Vegetation Classification	Effective Slope (degrees)	Acceptable 'Planning' BAL	Required Separation Distance (metres)
1	Class C Shrubland	0		9
1	Class C Shrubland	6.0		11
1	Class C Shrubland	12.9		13
2	Class A Forest	0		21
2	Class A Forest	3.9	**BAL-29**	27
3	Class G Grassland	6.6		10
4	Class C Shrubland	9.4		11
5	Class G Grassland	0		8
5	Class G Grassland	8.8		10

This requirement has been established through the State bushfire provisions, SPP 3.7 and the associated Guidelines, as being a key compliance requirement for development proposals in WA.

'Local Government Firebreak Notice APZ' Required Minimum Requirements for the Subject Site	
Requirement Set By:	Local Government (Shire of Mundaring)
Minimum Standard:	**Asset (Building) Protection Zone Specification** • The Asset Protection Zone (APZ) for habitable buildings and related structures, as defined within this Notice, must meet the following requirements, unless varied under an approved 'Alternative Fire Management Arrangement' as defined within this Notice, and applies only within the boundaries of the lot on which the habitable building is situated: • APZs for habitable buildings must extend a minimum of 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of the habitable building; • on sloping ground the APZ distance shall increase at least 1 metre for every degree in slope on the sides of the habitable building that are exposed to down slope natural vegetation; • APZs predominantly consist of managed vegetation, reticulated lawns and gardens and other non-flammable features; • all grass is maintained to or under 5cm; • fuel loads must be maintained at 2 tonnes per hectare or lower; • Clear separation distance between adjoining or nearby tree crowns; • a small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species; • trees are to be low pruned (or under pruned) to at least a height of 2 metres from ground; • no tree, or shrub over 2 metres high are to be within 2 metres of a habitable building; • tall shrubs over 2 metres high are not planted in groups close to the habitable building and ensure there is a gap of at least three times the height (at maturity) of the shrub away from the habitable building; • there are no tree crowns or branches hanging over habitable buildings; • ensure the roofs, gutters and walls of all buildings on the land are free of flammable matter; • install paths and non-flammable features immediately adjacent to the habitable building; • • wood piles and flammable materials stored a safe distance from habitable building.

Other Conditions:	**All land with an area of less than 5000sqm with a building on it** Maintain an Asset Protection Zone in line with the requirements of Section 5 of this Notice. For the remainder of the land on the lot outside of the Asset Protection Zone: • Maintain all grass on the land to a height no greater than 5cm; • Ensure no tree crowns overhang a building; • Prune trees and shrubs, and remove dead flammable material within 1.5 metres around all buildings; • Ensure the roofs, gutters and walls of all buildings on the land are free of flammable matter; and • Maintain fuel loadings in natural bush areas at less than 8 tonnes per hectare across the land. **All land with an area of 5000sqm or greater, with a building on it** Maintain an Asset Protection Zone in line with the requirements of Section 5 of this notice. For the remainder of the land on the lot outside of the Asset Protection Zone: • If the land is an area of less than 50,000sqm (5 Hectares) all grass must be maintained on the land to a height no greater than 5cm; • If the land is an area of 50,000sqm (5 Hectares) or greater, the grass must be maintained on the land to a height no greater than 5cm for a distance of 10m from any firebreak; • install a firebreak around all structures and immediately inside all external boundaries of the land; • prune trees and shrubs, and remove dead flammable material around all structures; • ensure the roofs, gutters and walls of all buildings on the land are free of flammable matter; • maintain fuel loadings in natural bush areas at less than 8 tonnes per hectare across the land. **All vacant land** • Install a firebreak immediately inside all external boundaries of the land; • If the land is an area of less than 50,000sqm (5 Hectares) all grass must be maintained on the land to a height no greater than 5cm; • If the land is an area of 50,000sqm (5 Hectares) or greater, the grass must be maintained on the land to a height no greater than 5cm for a distance of 10m from any firebreak; • Maintain fuel loadings in natural bush areas to less than 8 tonnes per hectare across the land.
This requirement has been established through the stated local government's annual fire break notice issued under the Bush Fires Act 1954 s33.	

6 Responsibilities for Implementation and Management of the Bushfire Protection Measures

A Bushfire Management Plan will be required for subsequent proposed subdivision stages within the Structure Plan Area. Responsibilities for implementation and management of the bushfire protection measures will apply as outlined in the following tables.

Table 6.1: Implementation responsibilities prior to the issue of titles for the Developer.

DEVELOPER - PRIOR TO ISSUE OF CERTIFICATE OF TITLES FOR NEW LOTS			
No.	Implementation Actions	Local Government Clearance	Bushfire Consultant Clearance
1	Planning approval may be conditioned with the requirement to make appropriate notifications (on the certificates of title and the deposited plan), of the existence of this document. The WAPC may condition a subdivision application approval with a requirement for the landowner / proponent to place a notification onto the certificate(s) of title and a notice of the notification onto the diagram or plan of survey (deposited plan). This will be done pursuant to Section 165 of the Planning and Development Act 2005 ('Hazard etc. affecting land, notating titles as to:') and applies to lots with a determined BAL rating of BAL-12.5 or above. The notification will be required to state: *'This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land'.*	☐	-

Table 6.2: Implementation responsibilities prior to lot sale, occupancy or building for the Landowner/Developer.

LANDOWNER/DEVELOPER - PRIOR TO LOT SALE, OCCUPANCY OR BUILDING	
No.	Implementation Actions
1	The local government may condition a development application approval with a requirement for the landowner/proponent to register a notification onto the certificate of title (it may also need to be included on the deposited plan). This will be done pursuant to Section 70A Transfer of Land Act 1893 as amended ('Factors affecting use and enjoyment of land, notification on title:'). This is to give notice of the bushfire hazard and any restrictions and/or protective measures required to be maintained at the owner's cost. This condition ensures that: 1. Landowners/proponents are aware their Lot is in a designated bushfire prone area and of their obligations to apply the stated bushfire risk management measures; and 2. Potential purchasers are alerted to the Bushfire Management Plan so that future landowners/proponents can continue to apply the bushfire risk management measures that have been established in the Plan.
2	Prior to sale and post planning approval, the entity responsible for having the Plan prepared should ensure that anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information and informed that it contains their responsibilities. This includes the landowners/proponents (including future landowners where the Plan was prepared as part of a subdivision approval), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).
3	Prior to sale of the subject Lot/s, each individual Lot is to be compliant with the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.
4	Prior to any building work, inform the builder of the existence of this Plan and the responsibilities it contains, regarding the required construction standards. This will be: • The standard corresponding to the determined BAL rating, as per the bushfire provisions of the Building Code of Australia (BCA); and/or • A higher standard as a result of the BMP establishing that construction is required at a standard corresponding to a higher BAL rating.
5	The Landowner/Developer is responsible for ensuring all bushfire protection measures indicated in the bushfire management plan, or additionally conditioned as part of the future subdivision proposal, are constructed or installed to the satisfaction of the Shire of Mundaring.

Table 6.3: Ongoing management responsibilities for the Landowner/Occupier.

LANDOWNER/OCCUPIER - ONGOING	
No.	Ongoing Management Actions
1	Maintain the Asset Protection Zone (APZ) to the **dimensions** and **standard** stated in the Plan.
2	Comply with the Shire of Mundaring annual Firebreak and Fuel Load Notice 'Firebreak Notice' issued under s33 of the Bush Fires Act 1954.
3	Ensure that any builders (of future structures on the Lot) are aware of the existence of this Plan and the responsibilities it contains regarding the application of construction standards corresponding to a determined BAL rating.
4	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: 1. the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and 2. with any identified additional requirements established by this BMP or the relevant local government.

Table 6.4: Ongoing management responsibilities for the Local Government.

LOCAL GOVERNMENT - ONGOING	
No.	Ongoing Management Actions
1	Monitor landowner compliance with the annual Firebreak Notice and Fuel Load Notice 'Firebreak Notice'.
2	Where control of an area of vegetated land is vested in the control of the local government and that area of land has influenced the assessed BAL rating/s of the subject site/s – and the BAL rating has been correctly assessed - there is an obligation to consider the impact of any changes to future vegetation management and/or revegetation plans with respect to that area.

Appendix 1 - Onsite Vegetation Management Technical Requirements

It is the responsibility of the landowner to maintain the established bushfire protection measures on their property. Not complying with these responsibilities can result in buildings being subject to a greater potential impact from bushfire than that determined by the assessed BAL rating presented in this Bushfire Management Plan.

For the management of vegetation within a lot (i.e. onsite) the following technical requirements exist:

1. **The APZ**: Installing and maintaining an asset protection zone (APZ) of the required dimensions to the standard established by the Guidelines for Planning in Bushfire Prone Areas (WA Planning Commission, as amended). When, due to the planning stage of the proposal to which this Bushfire Management Plan applies, defined APZ dimensions are known and are to be applied to existing or future buildings – then these dimensions are stated in Section 5.3.1 of this Plan.

2. **The Firebreak/Fuel Load Notice**: Complying with the requirements established by the relevant local government's annual firebreak notice issued under s33 of the Bushfires Act 1954. Note: If an APZ requirement is included in the Notice, the standards and dimensions may differ from the Guideline's APZ Standard – the larger dimension must be complied with.

3. **Changes to Vegetated/Non-Vegetated Areas**:

    a. If applicable to this Plan, the minimum separation distance from any classified vegetation, that corresponds to the determined BAL for a proposed building, must be maintained as either a non-vegetated area or as low threat vegetation managed to a minimal fuel condition as per AS 3959-2018 s2.2.3.2 (e) and (f). Refer to Part 4 of this Appendix 1.

    b. Must not alter the composition of onsite areas of classified vegetation (as assessed and presented in Section 3.0) to the extent that would require their classification to be changed to a higher bushfire threat classification (as per AS 3959-2018); and

    c. Must not allow areas within a lot (i.e. onsite) that have been:
        i. excluded from classification by being low threat vegetation or non-vegetated; and
        ii. form part of the assessed separation distance that is determining a BAL rating -

    ...to become vegetated to the extent they no longer represent a low threat (refer to Part 4 of Appendix 1). Note: The vegetation classification exclusion specifications as established by AS 3959-2018 s2.2.3.2, are included at Appendix 4 below for reference.

1. Requirements Established by the Guidelines – the Asset Protection Zone (APZ) Standards

(Source: Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2.1)

Defining the Asset Protection Zone (APZ)

Description: An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (by reducing fuel loads). The width of the required APZ varies with slope and vegetation. For planning applications, the minimum sized acceptable APZ is that which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It will be site specific.

The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context, but does not include grassland or vegetation on a neighbouring rural lot, farmland, wetland reserves and unmanaged public reserves.

For subdivision planning, design elements and excluded/low threat vegetation adjacent to the lot can be utilised to achieve the required vegetation separation distances and therefore reduce the required dimensions of the APZ within the lot.

Defendable Space: The APZ includes a defendable space which is an area adjoining the asset within which firefighting operations can be undertaken to defend the structure. Vegetation within the defendable space should be kept at an absolute minimum and the area should be free from combustible items and obstructions. The width of the defendable space is dependent on the space which is available on the property, but as a minimum should be 3 metres.

Establishment: The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity.

Note: Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation that can be involved in a bushfire, is unsafe.

Schedule 1: Standards for APZ

Fences: within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.

Objects: within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.

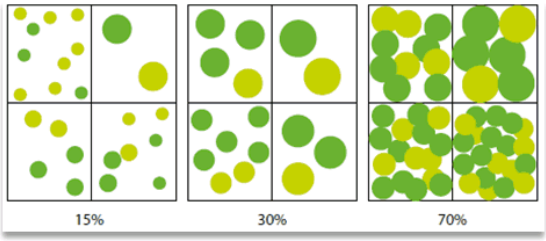
Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of two tonnes per hectare (example below).

Example Fine Fuel Load of Two Tonnes per Hectare

(Image source: Shire of Augusta Margaret River's Firebreak and Fuel Reduction Hazard Notice)

Trees (> 5 metres in height): trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy. Diagram below represents tree canopy cover at maturity.

Tree canopy cover – ranging from 15 to 70 per cent at maturity



(Source: Guidelines for Planning in Bushfire Prone Areas 2017, Appendix 4)

Shrubs (0.5 metres to 5 metres in height): should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m2 in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.

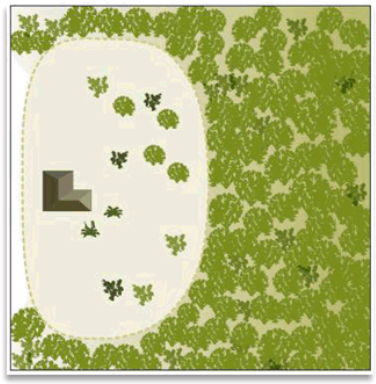
Ground covers (<0.5 metres in height): can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 mm in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.

Grass: should be managed to maintain a height of 100 mm or less.

The following example diagrams illustrate how the required dimensions of the APZ will be determined by the type and location of the vegetation.

Hazard on one side
APZ

Hazard on three sides
APZ



2. Requirements Established by the Local Government – the Firebreak Notice

These requirements are established by the relevant local government's Firebreak Notice created under s33 of the Bushfires Act 1954 and issued annually (potentially with revisions). The Notice may include additional components directed at managing fuel loads, accessibility and general property management with respect to limiting potential bushfire impact.

The relevant local government's current Firebreak Notice is available on their website, at their offices and is distributed as ratepayer's information. It must be complied with.

If Asset Protection Zone technical requirements are defined in the Notice, the standards and dimensions may differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with.

When, due to the planning stage of the proposal to which this Bushfire Management Plan applies, defined APZ dimensions are known and are to be applied to existing or future buildings – then these dimensions are stated in Section 5.3.1 of this Plan.

3. Requirements Recommended by DFES – Property Protection Checklists

Further guidance regarding ongoing/lasting property protection (from potential bushfire impact) is presented in the publication 'DFES – Fire Chat – Your Bushfire Protection Toolkit'. It is available from the Department of Fire and Emergency Services (DFES) website.

4. Requirements Established by AS 3959-2018 - Maintaining Areas within your Lot as 'Low Threat'

This information is provided for reference purposes. This knowledge will assist the landowner to comply with Management Requirement No. 3 set out in the Guidance Panel at the start of this Appendix. It identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

This information is taken from the Australian Standard AS 3959-2018 *Construction of buildings in bushfire prone areas*. This Standard presents the methods for calculating Bushfire Attack Levels that have been applied in this Report. The following specific section identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

"Australian Standard - AS 3959-2018 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas"

The following vegetation shall be excluded from a BAL assessment:

a) *Vegetation of any type that is more than 100m from the site.*
b) *Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified.*
c) *Multiple area of vegetation less than 0.25ha in area and not within 20m of the site or each other or of other areas of vegetation being classified vegetation.*
d) *Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified vegetation.*
e) *Non-vegetated areas that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.*
f) *Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.*

Notes:

1 *Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of a bushfire attack (recognisable as short cropped grass to a nominal height of 100mm for example).*
2 *A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.*

Appendix 2 - Vehicular Access Technical Requirements

Each local government may have their own standard technical requirements for emergency vehicular access and they may vary from those stated in the Guidelines.

Contact the relevant local government for the requirements that are to apply in addition to the requirements set out as an acceptable solution in the Guidelines. If the relevant local government requires that these are included in the Bushfire Management Plan, they will be included in this appendix and referenced.

Requirements Established by the Guidelines – The Acceptable Solutions

(Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4)

Vehicular Access Technical Requirements					
Technical Component	Vehicular Access Types				
	Public Roads	Cul-de-sacs	Private Driveways	Emergency Access Ways	Fire Service Access Routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	4.5	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum cross-fall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

* A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metres of paving and one metre of constructed road shoulders. In special circumstances, where 8 lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of ninety metres may be provided subject to the approval of both the local government and DFES.

Appendix 3 - Water Technical Requirements

Requirements Established by the Guidelines - Acceptable Solution A4.1: Reticulated Areas

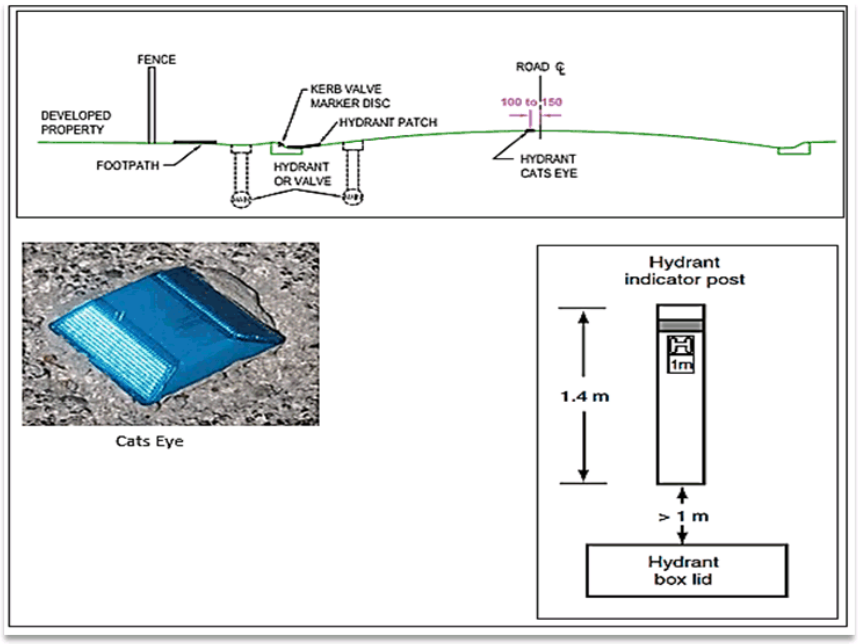
(Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4, Element 4)

The requirement is to supply a reticulated water supply and fire hydrants, in accordance with the technical requirements of the relevant water supply authority and DFES. The Water Corporation's 'No 63 Water Reticulation Standard' is deemed to be the baseline criteria for developments and should be applied unless local water supply authority's conditions apply.

Key specifications in the most recent version/revision of the design standard include:

- ***Residential Standard*** – hydrants are to be located so that the maximum distance between the hydrants shall be no more than 200 metres.
- ***Commercial Standard*** – hydrants are to be located with a maximum of 100 metre spacing in Industrial and Commercial areas.
- ***Rural Residential Standard*** – where minimum site areas per dwelling is 10,000 m² (1ha), hydrants are to be located with a maximum 400m spacing. If the area is further subdivided to land parcels less than 1ha, then the residential standard (200m) is to be applied.

Figure A4.1: Hydrant Location and Identification Specifications



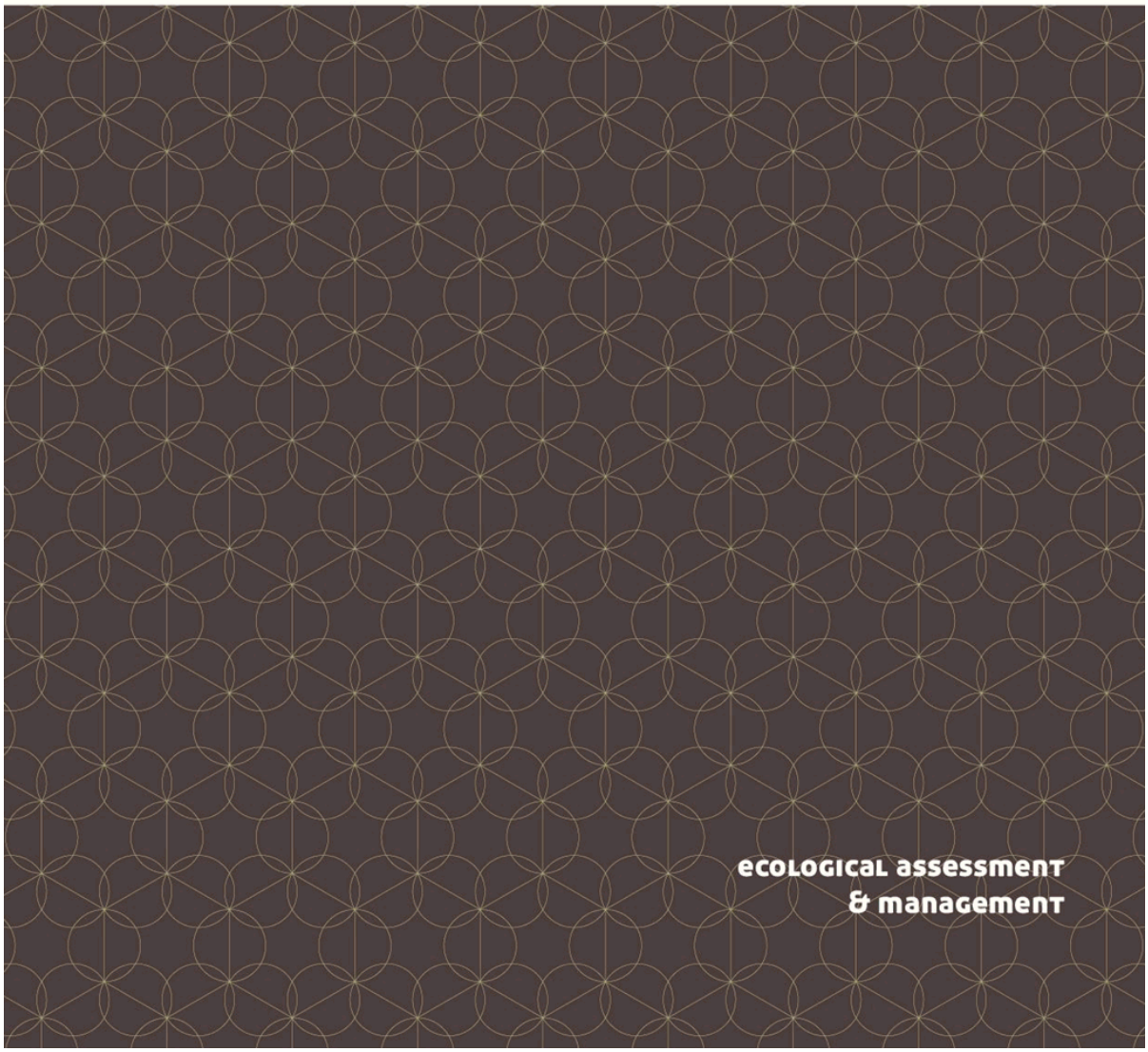
Contact the relevant water supply authority to confirm the technical requirements that are to be applied. They may differ from the minimum requirements of the 'baseline' Water Corporation's No. 63 Water Reticulation Standard.

Terratree

Targeted Flora and Fauna Habitat Survey of Proposed Development in Swan View

Prepared for Statewest Planning

Ref: T18022



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Joseph Grehan
Director and Principal Ecologist

DISCLAIMER

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Terratree Pty Ltd

Executive Summary

Statewest Planning (Statewest) commissioned Terratree Pty Ltd (Terratree) to undertake a Targeted flora and significant fauna habitat survey of the proposed subdivision on behalf of the owners of Lots 350 & 351 Viveash Rd and Lot 103 Tunnel Rd, in Swan View, WA (hereafter referred to as 'the survey area'). The owners propose to apply for a Scheme Amendment covering eight properties in Viveash Rd and Tunnel Rd, Swan View including block subdivision as well as road and sewer creation.

The Targeted flora and vegetation survey was conducted during the peak flowering period on 23rd November 2018 by Principal Ecologist Joseph Grehan and Ecologist Glenn Maslen of Terratree. The survey area was traversed by foot to verify and further define vegetation communities within the study area, and to find Threatened or Priority flora which had appeared during desktop database searches. Relevés were conducted to delineate vegetation communities as they were encountered. Tree species that are known to support Black Cockatoo breeding and had an adequate Diameter at Breast Height (DBH) were recorded by GPS during the survey.

A total of 84 vascular flora including 16 introduced (exotic) species, were recorded within the survey area, representing 66 genera from 32 families. Families with the highest species representation were Fabaceae (11 taxa), Proteaceae (11 taxa) and Myrtaceae (9 taxa). **Appendix D** lists all vascular flora species recorded in the survey area.

Two vegetation communities were identified during the survey. Type 1 vegetation was characterised as a granitic heathland community, with an overstorey of *Allocasuarina huegeliana* over a heathland of Melaleuca, Fabaceae and Proteaceae species. This was the main vegetation type in Lot 103, with some presence also in Lots 350 and 351. Type 2 vegetation was characterised as having an overstorey of *Corymbia calophylla* and *Eucalyptus wandoo,* with an open shrubland understorey consisting of species including *Calothamnus sanguineus, Hakea erinacea* and *Xanthorrhoea preissii.* The slopes of Lots 350 and 351 were dominated by Type 2 vegetation. None of the vegetation communities matched any description of Priority or Threatened Ecological Communities. A map of vegetation communities can be found in **Figure 1**.

A large portion of the survey area (77.24%) was rated as either Degraded or Completely Degraded, and therefore has limited significant vegetation value. Two small pockets in Lots 103 and 350 were classified as in 'very good' condition. A map of the vegetation condition of the survey area can be found in **Figure 2**.

No Threatened (Declared Rare) Flora were found during the survey. One Priority species, *Beaufortia purpurea* (Priority 3), was found throughout Vegetation Type 1 as a main understorey species. *B. purpurea* is an erect or spreading shrub, which grows from 0.3m-1.5m high. The species is found on rocky slopes or granitic soils and has red flowers from October to December. *B. purpurea* was found mainly in areas where vegetation was in 'very good' condition.

A total of 13 significant Black Cockatoo habitat trees were recorded within the survey area, with four trees possessing potential Black Cockatoo breeding hollows. Significant trees were all Marri (*Corymbia calophylla*) and Wandoo (*Eucalyptus wandoo*). Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksia naso*) were observed during the survey. Flora species that are known to be used by Black Cockatoos for breeding, foraging and roosting were identified during the survey. A map of the locations of significant habitat trees can be found in **Figure 3**.

Much of the survey area is densely infested with weed species. Most notably, *Watsonia meriana* var. *bulbillifera* was found across all vegetation communities. Other significant weed species included Fountain Grass (*Pennisetum setaceum*) and Common Wild Oats (*Avena fatua*). No Weeds of National Significance or Declared weeds under the *Biosecurity and Agriculture Management Act* 2007 were found during the survey.

Terratree makes the following recommendations for future development on site:

- Ensure machinery entering site, especially earth-moving equipment is 'clean on entry' to the survey area i.e. free of soil and vegetative materials to prevent the introduction of weeds and pathogens;

- If significant populations of Priority flora are to be impacted, then every effort should be made to minimise impacts by demarcating populations prior to ground disturbance activities;
- Impacts to Black Cockatoo habitat should be focused on avoidance and mitigation, as per **Table 2** in the EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (SEWPAC 2012). Specific recommendations for the survey area include:
    - Trees that provide significant habitat for Black Cockatoos should be retained if possible during construction; and
    - Avoidance and control of the introduction of pathogens and plant diseases during activities which may negatively impact retained or surrounding habitat of the development.

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1 Introduction

Statewest Planning (Statewest) commissioned Terratree Pty Ltd (Terratree) to undertake a Targeted flora and significant fauna habitat survey of the proposed subdivision on behalf of the owners of Lots 350 & 351 Viveash Rd and Lot 103 Tunnel Rd, in Swan View, WA (hereafter referred to as 'the survey area'). The owners propose to apply for a Scheme Amendment covering eight properties in Viveash Rd and Tunnel Rd, Swan View including block subdivision as well as road and sewer creation.

1.1 Project Location.

The survey area is 6.72ha, comprised of 3 properties: Lots 103, 350 and 351. The survey area is heavily impacted from residential development. Two Lots, 350 and 351, are next to the John Forrest National Park, an A Class Nature Reserve spanning 2678ha.

1.2 Scope of Work

The scope of work included the following:

- Conduct a desktop assessment;
- Conduct a Targeted flora survey to identify Threatened (Declared Rare) and Priority flora;
- Review the impact on remnant native vegetation;
- Review Threatened and Priority Ecological Communities;
- Provide recommendations for the management and minimisation of the following environmental impacts to be included in the report:
    - Minimising damage to vegetation including physical damage and introduction of weeds and pathogens;
    - Impacts and conservation opportunities to significant fauna habitat, including breeding and foraging values for Black Cockatoo species; and
    - Any other flora, fauna or wetland related impacts that are identified during the desktop review and field survey.

2 Regulatory Context

The following is a list of relevant government legislation, government policy, publications and project reports pertaining to the site:

Legislation

- *Biodiversity Conservation Act* (BC Act) 2016 (Western Australia)
- *Environmental Protection Act* (EP Act) 1986 (Western Australia)
- Western Australian Planning and Development Act 2005 (Western Australia)
- Biosecurity and Agriculture Management Act (BAM Act) 2007 (Western Australia)
- Environmental Protection and Biodiversity Conservation Act (EPBC Act) 1999 (Federal)

Government Policy and Publications

- Position Statement No. 2: Environmental Protection of Native Vegetation in Western Australia (EPA 2000)
- Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002)
- Environmental Protection (Clearing of Native Vegetation) Regulation 2004
- Environmental Protection (Environmentally Sensitive Areas) Notice 2005
- EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (Department of Sustainability, Environment, Water, Population and Communities [SEWPAC] 2012).
- EPA Technical Guide – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016)

2.1 Threatened and Priority Flora

2.1.1 *Environment Protection and Biodiversity Conservation Act* (1999) (Commonwealth of Australia)

At a Commonwealth level, Threatened flora are protected under the EPBC Act, which lists species that are considered Critically Endangered, Endangered, Conservation Dependant, Extinct or Extinct in the Wild (Table C.1., **Appendix C**).

2.1.2 *Biodiversity Conservation Act* (2016) (Western Australia)

Taxa which have been adequately searched for and are deemed to be either rare, in danger of extinction or otherwise in need of special protection in the wild, are gazetted as Threatened Species (Schedule 1, BC Act 2016). Threatened Species are further categorised by the Department according to their level of threat using IUCN Red List criteria:

- CR: Critically Endangered – considered to be facing an extremely high risk of extinction in the wild;
- EN: Endangered – considered to be facing a very high risk of extinction in the wild in the near future; and
- VU: Vulnerable – considered to be facing a high risk of extinction in the wild in the medium-term future.

These taxa are legally protected and their removal or impact to their surroundings cannot be conducted without Ministerial approval, obtained specifically on each occasion for each population (Table C.2., **Appendix C**)

2.1.3 Priority Flora

The Department of Biodiversity, Conservation and Attractions (DBCA, formerly DPaW) maintains a list of Priority Flora taxa, which are considered poorly known, uncommon or under threat but for which there is insufficient justification, based on known distribution and population sizes, for inclusion in Schedule 1 of the BC Act. The list of Threatened (Declared Rare) flora is reviewed annually by a scientific panel that assess a taxon's conservation status and ranks them into categories. The Priority Flora list is dynamic. As new information becomes available conservation status is reviewed and changes to the listing may result. The

categories for Priority Flora give an indication of the priority for undertaking further surveys based on the number of known sites, and degree of threat to those populations. A Priority taxon is assigned to one of five priority categories (Table C.2., **Appendix C**)

2.1.4 Locally and Regionally Significant Flora and Vegetation

In addition to plant taxa being recognised as significant through their Declared Rare of Priority Flora status, they can also be significant for a number of other reasons. The EPA Technical Guide for Flora and Vegetation Surveys (EPA 2016) states that flora and vegetation can be "significant" for a range of reasons including but not limited to:

Flora

- "Being identified as threatened or priority species
- Locally endemic or association with a restricted habitat type (e.g. surface or groundwater dependent ecosystems)
- New species or anomalous features that indicate a potential new species
- Representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions or isolated outliers of the main range)
- Unusual species, including restricted subspecies, varieties or naturally occurring hybrids
- Relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape".

Vegetation

- "Being identified as threatened or priority ecological communities
- Restricted distribution
- Degree of historical impact from threatening processes
- A role as a refuge
- Providing an important function required to maintain ecological integrity of a significant ecosystem".

2.2 Threatened and Priority Fauna

In a legislative context, the conservation of fauna is covered primarily by the following legislation and international treaties:

- Environment Protection and Biodiversity Conservation Act 1999
- Biodiversity Conservation Act 2016
- Environmental Protection Act 1986
- Conservation and Land Management Act 1984
- China Australia Migratory Bird Agreement (CAMBA)
- Japan Australia Migratory Bird Agreement (JAMBA)
- Republic of Korea and Australia Migratory Bird Agreement (ROKAMBA)

The following documents are relevant to the management of fauna:

- EPA Position Statement Nº. 3: Terrestrial Biological Surveys
- EPA Guidance Statement Nº. 51: Terrestrial Flora and Vegetation Surveys
- EPA Guidance Statement Nº. 56: Terrestrial Fauna Surveys
- EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (Department of Sustainability, Environment, Water, Population and Communities 2012).

Any animal that is native to WA is protected under the State's primary wildlife conservation legislation, the Biodiversity Conservation Act (2016). Some fauna species have additional protection at a Federal level under the *EPBC Act.* Penalties apply for any damage to individuals, populations or habitats of protected species.

2.2.1 *Environment Protection and Biodiversity Conservation Act* (1999) (Commonwealth of Australia)

At a Commonwealth level, Threatened fauna are protected under the EPBC Act, which lists species that are considered Critically Endangered, Endangered, Conservation Dependant, Extinct or Extinct in the Wild (Table C.1., **Appendix C**).

2.2.2 *Biodiversity Conservation Act* (2016) (Western Australia)

Fauna species which have been adequately surveyed and are deemed to be either rare, in danger of extinction or otherwise in need of special protection are gazetted as Threatened Species (Schedule 1, BC Act 2016). These taxa are legally protected and their removal or impact to their surroundings cannot be conducted without Ministerial approval, obtained specifically on each occasion for each population (Table C.3., **Appendix C**)

2.2.3 Priority Fauna

DBCA has produced a supplementary list of "Priority" fauna, including species that are not considered "Threatened" or scheduled under the *BC Act*, but for which DBCA considers require attention (Table C.4. **Appendix C**). These categories are determined by the total distribution of the species within Australia (and internationally where migratory species are concerned), not just within Western Australia.

2.2.4 Threatened and Migratory Species

The *EPBC Act* protects matters of National Environmental Significance (NES), including threatened and migratory species protected under international agreements such as the Japan–Australia Migratory Bird Agreement (JAMBA), the China–Australia Migratory Bird Agreement (CAMBA), the Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA) and the Bonn Convention (the Convention on the Conservation of Migratory Species of Wild Animals). The *EPBC Act* states that the proponent must not take an action that is likely to have a significant impact on any matters of NES without approval.

2.3 Threatened and Priority Ecological Communities

Ecological communities are naturally occurring biological assemblages located in a particular type of habitat. At a national level, Threatened Ecological Communities (TECs) are protected under the EPBC Act. TECs are listed under the EPBC Act as either 'Critically Endangered', 'Endangered' or 'Vulnerable'

The DBCA also maintains a list of TECs endorsed by the Minister of Environment (DEC, 2015) that are classified as being either 'Presumed Totally Destroyed', 'Critically Endangered', 'Endangered' or 'Vulnerable'.

The DBCA maintains an additional list of Priority Ecological Communities (PECs), for communities that could potentially be classified as TECs, but are not currently adequately defined or surveyed. Communities are placed into one of five Priority categories (1-5).

Definitions of these conservation codes are provided in Table C.5 and Table C.6., **Appendix C**.

2.4 Environmentally Sensitive Areas

Under section 51B of the EP Act the Minister can, by notice, declare an area of the State specified in the notice or an area of the State to be an Environmentally Sensitive Area (ESA). ESAs are protected under the *Environmental Protection (Clearing of Native Vegetation) Regulation 2004* and are selected for their environmental values at state or national levels. ESA's can be assigned with regard to the following criteria:

- Protection of rare or threatened species of native plants;
- Protection of wetlands and water courses;
- Protection of sites that have other high conservation, scientific or aesthetic values;
- Protection of Aboriginal or European cultural sites; or
- A declared World Heritage property as defined in section 13 of the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) of the Commonwealth.

An ESA is defined under Regulation 6(1) of the *Environmental Protection (Clearing of Native Vegetation) Regulation 2004* as including:

- An area that is registered on the Register of the National Estate, because of its natural values, under the Australian Heritage Commission Act 1975 of the Commonwealth;
- A defined wetland and the area within 50 m of the wetland;
- The area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located;
- The area covered by a threatened ecological community; and
- A Bush Forever site listed in "Bush Forever" Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site may be cleared under a decision of the Western Australia Planning Commission.

2.5 Introduced Flora

2.5.1 Weeds of National Significance (WONS)

At a national level there are twenty weed species listed as Weeds of National Significance (WONS). *The Commonwealth National Weeds Strategy: A Strategic Approach to Weed Problems of National Significance* (2012) describes the broad goals and objectives in managing these species.

2.5.2 Declared Plants

The *Biosecurity and Agriculture Management Act* 2007 (BAM Act, DAFWA, 2007) seeks to prevent serious animal and plant pests and diseases from entering the State and becoming established, and to minimise the spread and impact of any that are already present. The BAM Act, and associated regulations, replace the *Agriculture and Related Resources Protection Act* 1976 (and associated regulations). The BAM regulations were enacted on 1 May 2013, placing organisms into four categories:

- Permitted organism (listed under Section 11) – permitted in Western Australia subject to regulations;
- Prohibited organism (listed under Section 12) – prohibited in Western Australia subject to regulations (i.e. is a Declared Pest for the whole of the State);
- Permitted organism: permit required (under regulation 73) – must not be imported unless in accordance with an import permit; and
- Permitted organism: Declared Pests (under Section 22) – can apply to a part of, or the whole of, the State.

The current Western Australian Organism List (WAOL) (DAFWA, 2018) lists organisms in each of these categories. Unlisted organisms must not be imported (unless in accordance with an import permit and regulations). The BAM Act further categorises Declared Pests in one of three control categories (**Table 1**):

Table 1: Control categories for declared pests.

Declared Plant Category	Description
C1 - Exclusion	Pests assigned to this category are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2 - Eradication	Pests assigned to this category are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3 - Management	Pests assigned to this category are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

*Source: BAM Act 2007 and WAOL (DAFWA, 2018).

2.5.3 Environmental Weeds

A second and much more extensive categorisation of weeds has been developed by the DBCA in the Environmental Weed Strategy (Department of Conservation and Land Management, 1999). Species considered to adversely affect the communities they invade are evaluated on the following criteria:

- **Invasiveness:** ability to invade bushland in good to excellent condition, or ability to invade waterways (scored as yes or no);
- **Distribution:** wide current or potential distribution including consideration of known history of widespread distribution elsewhere in the world (scored as yes or no);
- **Environmental impacts:** ability to change the structure, composition and function of ecosystems; in particular, an ability to form a monoculture in a vegetation community (scored as yes or no).

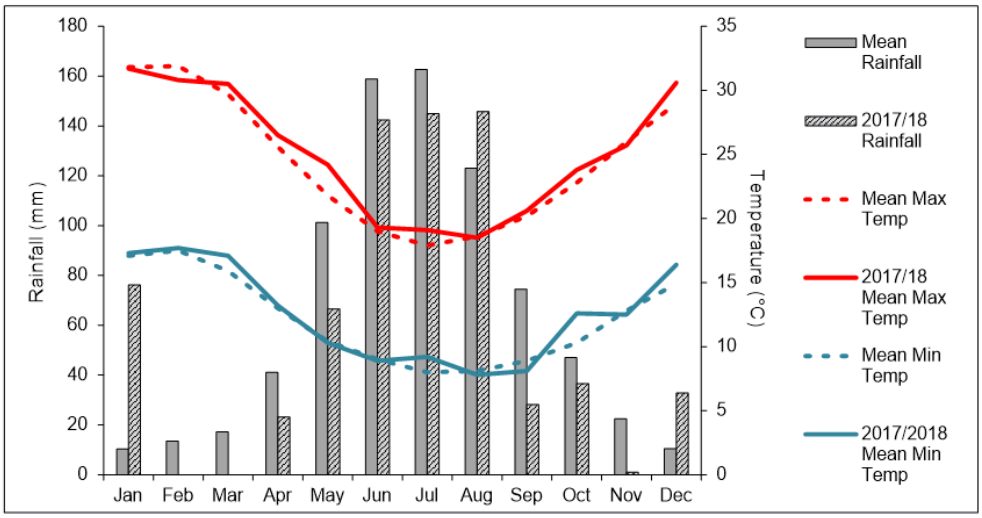
Weeds listed as Environmental Weeds are ranked into four categories using the above criteria and scoring system:

- **High:** a species which scores yes to all three of the above criteria. A rating of high indicates a species that should be prioritised for control and/or research;
- **Moderate:** a species which scores yes for two of the above criteria. A rating of moderate indicates a species which should be monitored. Control or research should be directed to it if funds are available;
- **Mild:** a species which scores yes to one of the criteria. A mild rating indicates monitoring or control if appropriate; and
- **Low:** a species which does not score yes for any of the criteria. A low rating indicates a low requirement for monitoring.

3 Existing Environment

3.1 Climate

The climate in Perth is characterised as Mediterranean, with hot, dry summers and mild, wet winters. These seasons extend into the autumn and spring months, which are transitional periods between the main seasons. The change in season usually occurs between April and May, with an average of 80% of the rainfall occurring between May and October. Average annual rainfall for the area is 782mm. There was higher than average rainfall in the summer of 2017/2018, however rainfall levels have been below average for every month since then, with the exception of August. Rainfall for the past 12 months has been lower than average, with 697.6mm. The average daily temperatures range between 16.5°C (min) and 30.9°C (max) in summer and between 8.4°C (min) and 18.5°C (max) in winter (Bureau of Meteorology, 2018). Temperatures have been on average higher than average, with the average maximum temperature being 25.11°C compared to the average of 24.53°C. Climate data for the area is presented in **Graph 1**.



Graph 1: Climate Data from December 2017 to November 2018 from Midland and Perth Airport weather stations (Bureau of Meteorology 2018).

3.2 Topography and Soils

The survey area has an easterly aspect as the land slopes towards John Forrest National Park. The survey area is bounded by Tunnel Road and residences to the north, Viveash Road to the west, Pechey Road and residences to the east and residential development to the south. The survey area lies in the Darling Scarp Subsystem, characterised by very steep slopes with shallow red and yellow earths, loamy soils with many scattered gneiss rock outcrops (DAF, 2003).

3.3 Regional Vegetation

The survey area lies within the Swan Coastal Plain Subregion of the Drummond Botanical Subdistrict, as described in Plant Life of Western Australia (Beard, 1990). The Drummond Botanical Subdistrict is described as 'Mainly Banksia low woodland on leached sands with Melaleuca swamps where ill-drained; woodland of Tuart (Eucalyptus gomphocephala), Jarrah (E. marginata) and Marri (Corymbia calophylla) on less leached soils. The climate is described as 'warm Mediterranean', with winter precipitation of 600-1000mm and 5-6 dry months per year.

The survey area occurs in the Darling Scarp vegetation complex DS2, described by Heddle et al. (1980) as an Open Woodland of *Corymbia calophylla, Eucalyptus wandoo, C. haematoxylon* and *Allocasuarina huegeliana* over heathland of *Borya sphaerocephala, Grevillea bipinnatifida, Hakea undulata, H. elliptica, H. trifurcata, Cheilanthes austrotenuifolia, Trymalium ledifolium* and *Calothamnus graniticus.*

4 Desktop Review

4.1 Threatened and Priority Flora

A database search was conducted for NatureMap and EPBC Protected Matters databases for Threatened and Priority flora records within 5 kilometres of the survey area. In total, 29 flora species of conservation significance have been recorded within the search area, consisting of 14 Threatened, 9 Priority 3 and 6 Priority 4 flora taxa. **Table 2** lists the Threatened and Priority flora species recorded within the search area, and the database in which the record was identified.

Table 2: Threatened and Priority flora recorded within 5km of the survey area.

Conservation Status	Species	NatureMap	EPBC
Threatened	*Acacia aphylla*	X	X
	Anthocercis gracilis	X	X
	Calectasia cyanea	X	
	Calytrix breviseta subsp. *breviseta*	X	
	Diplolaena andrewsii	X	X
	Diuris micrantha		X
	Eleocharis keigheryi		X
	Eucalyptus x balanites		X
	Grevillea christineae		X
	Grevillea curviloba subsp. *incurva*		X
	Synaphea sp. Fairbridge Farm (D. Papenfus 696)		X
	Synaphea sp. Pinjarra Plain	X	
	Thelymitra dedmaniarum		X
	Thelymitra stellata		X
Priority 3	*Acacia oncinophylla* subsp. *oncinophylla*	X	
	Beaufortia purpurea	X	
	Cyathochaeta teretifolia	X	
	Halgania corymbosa	X	
	Lasiopetalum glutinosum subsp. *glutinosum*	X	
	Pithocarpa corymbulosa	X	
	Tetratheca pilifera	X	
	Thysanotus anceps	X	
	Verticordia serrata var. *linearis*	X	
Priority 4	*Calothamnus accedens*	X	
	Darwinia pimelioides	X	
	Lasiopetalum bracteatum	X	
	Persoonia sulcata	X	
	Senecio leucoglossus	X	
	Thysanotus glaucus	X	

4.2 Threatened and Priority Fauna

A database search was conducted for NatureMap and EPBC Protected Matters databases for Threatened and Priority fauna records within 10 kilometres of the survey area.

In total, 11 species listed as Threatened under the *BC Act* or the *EPBC Act*, were identified in the database search, consisting of 2 Critically Endangered, 3 Endangered and 5 Vulnerable fauna species. In addition, 7 migratory bird and one specially protected species were identified. 2 Priority 3 and 2 Priority 4 fauna species were also identified as occurring in the local area.

Table 3 presents the NatureMap and EPBC Protected Matters results for records of fauna of conservation significance within 10km radius of the survey area.

Table 3: NatureMap and EPBC Protected Matters database results for Threatened, Schedule and Priority Fauna species.

Type	Conservation Code	Species	EPBC	NatureMap
Bird	CR, IA	*Callidris ferruginea* (Curlew Sandpiper)	X	
		Numenius madagascariensis (Eastern Curlew, Far Eastern Curlew)	X	
	EN	*Calyptorhynchus baudinii* (Baudin's Cockatoo, Long-billed Black Cockatoo)	X	X
		Calyptorhynchus latirostris (Carnaby's Cockatoo, Short-billed Black-Cockatoo)	X	X
		Rostratula australis (Australian Painted-snipe)	X	
	VU	*Calyptorhynchus banksii naso* (Forest Red-tailed Black-Cockatoo, Karrak)	X	X
		Leipoa ocellata (Malleefowl)	X	
	OS	*Falco peregrinus* (Peregrine Falcon)		X
	IA	*Apus pacificus* (Fork-tailed Swift)	X	
		Motacilla cinerea (Grey wagtail)	X	
		Actitis hypoleucos (Common Sandpiper)	X	
		Calidris acuminata (Sharp-tailed Sandpiper)	X	
		Callidris melanotos (Pectoral Sandpiper)	X	
		Pandion haliaetus (Osprey)	X	X
		Tringa nebularia (Common Greenshank)	X	
Insect	P3	*Australotomurus morbidus* (cemetery springtail)		X
		Euoplos inornatus (inornate trapdoor spider)		X
Mammal	VU	*Dasyurus geoggroii* (Chuditch, Western Quoll)	X	X
		Setonix brachyurus (Quokka)	X	
	P4	*Hydromys chrysogaster* (Water-rat, Rakali)		X
		Isodon fusciventer (Quenda, southwestern brown bandicoot)		X
Mollusc	VU	*Westralunio carteri* (Carter's Freshwater Mussel)	X	X

4.3 Threatened Ecological Communities

Analysis of Naturemap databases identified 3 Threatened Ecological Communities (TEC's) as potentially occurring within 5km of the survey area. **Table 4** lists these communities, their descriptions and their conservation status at State and Federal levels.

Table 4: Threatened Ecological Communities within 5km of the survey area

Threatened Ecological Community	WA Conservation Status (State)	EPBC Conservation Status (Federal)
Banksia Woodland of the Swan Coastal Plain ecological community	Endangered	Endangered
Corymbia calophylla – Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Critically Endangered	Endangered
Shrublands and Woodlands of the eastern Swan Coastal Plain	Critically Endangered	Endangered

5 Methods

The Targeted Flora and Vegetation survey was conducted during the peak flowering period on 23rd November 2018 by Principal Ecologist Joseph Grehan and Ecologist Glenn Maslen of Terratree.

5.1 Flora and Vegetation

The flora and vegetation field assessment was conducted in accordance with the methods described in EPA *Technical Guide - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016). Specifically, the assessment included:

- a desktop study; and
- a Targeted survey for Threatened (Declared Rare) and Priority flora.

After the initial desktop study, descriptions and photographs of Threatened (Declared Rare) and Priority Flora identified in database searches or previously recorded in the area, were compiled from FloraBase and available literature to produce a 'field guide' to assist botanists with identification of target species during the survey.

The survey area was traversed by foot to verify and further define vegetation communities within the study area, and to find Threatened or Priority flora which had appeared during desktop database searches. Relevés were conducted to delineate vegetation communities as they were encountered.

Where species could not be identified in the field, they were collected, labelled, pressed, dried and frozen in accordance with the requirements of the West Australian Herbarium. Subsequent to freezing the collected plant specimens were later identified by comparing collections with pressed specimens housed at the herbarium and using taxonomic keys and other reference materials.

5.2 Relevés

A total of 4 relevés were sampled within the study. Relevé locations were selected using aerial photography, topographic features and field observations to represent the diversity of vegetation present. Standardised data collection sheets were used to ensure consistent data records for the following features in each Relevé:

- Observer
- Date
- Location/site
- GPS Location (GDA 94)
- Species observed
- Soil type and colour
- Topography
- Degree and nature of disturbance
- Vegetation community and condition

Descriptions of communities were based on the nomenclature of the National Vegetation Information System (NVIS) (ESCAVI, 2003).

5.3 Vegetation Condition

The level of classification of vegetation condition was determined based on the (perceived) ability of the bushland to maintain itself (**Table 5**). Disturbance and degree of alteration to the community in terms of structure and ecological function were also considered).

Table 5: Keighery Vegetation Condition Scale (Keighery, 1994)

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

5.4 Potential Significant Fauna Habitat

Potential Breeding Habitat Trees as per the EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (SEWPAC 2012) are described as:

> *"'…trees of species known to support breeding…" "…within the range of the species which either have a suitable nest hollow OR are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, suitable DBH is 500 mm. For salmon gum and wandoo, suitable DBH is 300 mm."*

Tree species that are known to support breeding and had an adequate DBH were recorded by GPS during the survey.

5.5 Mapping

Vegetation community areas were digitised using QGIS 3.2 software (QGIS Development Team, 2018), by digitising vector polygons over a high-resolution aerial photograph layer. Vegetation mapping was conducted by delineating plant communities based on distinctive characteristics such as vegetation structure, dominant species and species composition. A combination of aerial photography and ground-truthing was used to interpret the vegetation patterns present in the study area.

6 Results

6.1 Flora

A total of 84 vascular flora including 16 introduced (exotic) species, were recorded within the survey area, representing 66 genera from 32 families. Families with the highest species representation were Fabaceae (11 taxa), Proteaceae (11 taxa) and Myrtaceae (9 taxa). **Appendix D** lists all vascular flora species recorded in the survey area.

6.1.1 Threatened and Priority Flora

One Priority species, *Beaufortia purpurea* (Priority 3), was found during the survey. This species was found throughout Community Type 1, as a dominant understorey species in the community.

6.2 Vegetation Communities

Two vegetation communities were identified during the survey. The first community, Type 1, had vegetation that was characterised as a granitic heathland community. Vegetation Type 2 was characterised as having an overstorey of *Corymbia calophylla* and *Eucalyptus wandoo,* with a similar understorey to Type 1 vegetation. An area statement for both community types can be found in **Table 6**. Both vegetation communities had weed infestations, most notably *Watsonia meriana* var. *bulbillifera.* A full description of the vegetation communities can be found in **Appendix E**. A figure spatially representing the vegetation communities within the survey area can be found in **Figure 1**.

Table 6: Area Statement of Vegetation Community Types in Survey Area

Community Type	Area (Ha)	% of survey area
Type 1	1.98ha	29.47%
Type 2	1.65ha	24.52%
Not assessed due to vegetation being too degraded.	3.09ha	46.01%

6.3 Vegetation Condition

Vegetation condition is usually rated according to the Bush Forever Vegetation Condition Scale commonly used in the Perth Metropolitan Region (Keighery, 1994). According to the definitions of vegetation conditions described in **Table 5** the vegetation condition within the survey area ranges from 'completely degraded' to 'very good'. A table with the areas and percentages of the study area of the degradation of the site can be found in **Table 7**. A figure spatially representing the vegetation condition throughout the site can be found in **Figure 2**.

Table 7: Area Statement of Vegetation Condition Ratings in Survey Area

Condition Rating	Area (Ha)	% of survey area
Very Good	1.22ha	18.17%
Good	0.31ha	4.58%
Degraded	2.47ha	36.82%
Completely Degraded	2.72ha	40.42%

6.4 Weeds

Sixteen introduced flora species were recorded within the survey area, representing 19.3% of recorded floristic diversity. The vegetation understorey in most of the survey area is dominated by *Watsonia meriana* var. *bulbillifera.* Other areas within the site are heavily infested with Fountain Grass (*Pennisetum setaceum*) and Wild Oats (*Avena fatua*). No 'Declared' weed species listed under the *BAM Act* 2007 were recorded during the site visit. In addition, no Weeds of National Significance were recorded.

6.5 Significant Fauna Habitat

An assessment of the fauna habitat values of the survey area was conducted during the survey. In particular, the fauna assessment focussed on potential habitat for the three Threatened species of Black Cockatoos: Carnaby's Cockatoo (Endangered) *Calyptorhynchus latirostris,* Baudin's Cockatoo (Endangered) *Calyptorhynchus baudinii,* and the Forest red-tailed Black Cockatoo (Vulnerable) *Calyptorhynchus banksii naso.*

Potential nesting and roosting habitat species included 13 mature Marri (*Corymbia calophylla)* and Wandoo (*Eucalyptus wandoo)* trees. Four of these trees possessed hollows that could potentially be used as breeding sites for Black Cockatoos. The Diameter at Breast Height (DBH) for the Marri and Wandoo trees ranged from 50 to 80cm, and their locations have been mapped spatially in **Figure 3**. Potential foraging species include species such as *Banksia sessilis* and *Allocasuarina huegeliana,* which were found throughout Vegetation Type 1.

6.6 Threatened Ecological Communities

No vegetation communities recorded during the survey matched the descriptions for Threatened and Priority Ecological Communities that were identified during the desktop survey as potentially occurring within the survey area (**Table 4**).

7 Discussion

7.1 Vegetation Condition

Remnant native vegetation in the survey area is degraded as most of the land has been cleared or colonised by weeds, due to the location of the blocks within a residential area. A large proportion of the survey area (77.24%) was rated as either Degraded or Completely Degraded, and therefore there has limited significant vegetation values. An example of Degraded vegetation within the survey area can be found in **Plate 2**.

In total 18.17% of the survey area was classified as Very Good vegetation, which was limited to the north-east boundary in Lot 103 and a small remnant patch in the centre of Lot 350. These patches are affected by weeds, however, still have good vegetation cover and species diversity. These patches are also the habitat areas for the Priority 3 species *Beaufortia purpurea* (P3).

7.2 Vegetation Communities

Two vegetation communities were identified during the survey. The first community, Type 1, had vegetation that was characterised as a granitic heathland community, with an overstorey of *Allocasuarina huegeliana* over a heathland of *Melaleuca,* Fabaceae and Proteaceae species. Vegetation Type 2 was characterised as having an overstorey of *Corymbia calophylla* and *Eucalyptus wandoo,* with a more open shrubland understorey than Type 1, including *Calothamnus sanguineus, Hakea erinacea* and *Xanthorrhoea preissii*. Both vegetation communities had weed infestations, most notably *Watsonia meriana* var. *bulbillifera*. A full description of the vegetation communities can be found in **Appendix E**.

Approximately 46% of the vegetation within the survey area was Degraded or Completely Degraded and therefore was not mapped as separate vegetation communities. This included areas that had significant weed infestations, such as areas of Fountain Grass (*Pennisetum setaceum)* which were completely dominant (**Plate 3**), as well as some areas that were cleared of all vegetation. Type 1 vegetation was the main vegetation type in Lot 103, with some presence in Lots 350 and 351 around granite outcrop areas. The slopes on Lots 350 and 351 were dominated by Type 2 vegetation, with some areas of Type 1 vegetation.

7.3 Threatened and Priority Flora Species

7.3.1 *Beaufortia purpurea* (P3)

Beaufortia purpurea is a Priority 3 erect or spreading shrub, which grows from 0.3-1.5m high. The species has red or purple flowers which appear in October to December. *Beaufortia purpurea* is found on lateritic or granitic soils and rocky slopes (Florabase, 2018). *Beaufortia purpurea* is distinguished from other *Beaufortia* species, in that the leaves are 5-10mm long and the sepals are hairy, being much longer than broad (Burbidge 2016). The species occurs on and near (including the base of) the Darling Scarp near Perth, where it has a limited distribution on and near the Darling Scarp, occurring in some small conservation reserves, with a maximum range of only 55km (Burbidge 2016). A photo of *Beaufortia purpurea* can be found in **Plate 1**.

Beaufortia purpurea was found as a main understorey species in Vegetation Type 1 and was found across most of the survey area in areas where vegetation was considered Very Good.

7.4 Threatened, Schedule and Priority Fauna Habitat

A total of 13 significant Black Cockatoo habitat trees were recorded within the survey area, with four trees possessing potential Black Cockatoo breeding hollows. Significant trees were all Marri (*Corymbia calophylla*) and Wandoo (*Eucalyptus wandoo*). The Diameter at Breast Height (DBH) for all of recorded trees was greater than 50cm, and they are therefore considered to be potential Black Cockatoo habitat trees.

Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksia naso)* were observed to be active in the area during the survey (**Plate 5**). No other species that can compete with Black Cockatoos such as pink and grey

Galahs (*Eolophus roseicapilla)*, Rainbow Lorrikeets (*Trichoglossus haematodus)* or Eastern long-billed Corellas (*Cacatua tenuirostris)* were observed during the survey.

A number of the flora species found during the survey would make adequate foraging species for Black Cockatoos, including Proteaceaous species such as *Banksia* sp., *Hakea* sp. and *Grevillea* sp., as well as *Allocasuarina* sp. and *Eucalyptus* sp. known to be used by Black Cockatoos (SEWPAC 2012).

7.5 Weeds

Weeds were prolific in the study area, with *Watsonia meriana* var. *bulbillifera* being present in all vegetation types (**Plate 4**). Fountain Grass (*Pennisetum* setaceum) formed thickets in some areas. In total, 16 weed species were found during the survey. None of these weed species were Declared Weeds under the BAM Act 2007, or Weeds of National Significance. Weed presence is a major reason, aside from cleared land, that vegetation is classified as Degraded within the survey area.

8 Limitations

The potential limitations of the survey, as outlined in the EPA Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016) are outlined in **Table 8**.

Table 8: Potential limitations and discussion of their relevance to the study area

Potential Limitation	Discussion
Sources of information and availability of contextual information (i.e. pre-existing background vs. new material)	**Not a Limitation.** There was adequate local and regional background information to inform the Desktop study of the survey area.
Scope (e.g. what life forms, etc., were sampled)	**Not a limitation**. There were no limitations on the scope. The survey assessed vegetation types and vascular plant species within the study area, including Priority species.
Proportion of flora collected and identified (based on sampling, timing and intensity)	**Not a limitation**. The study was undertaken in accordance with the description of Targeted Surveys in EPA Technical Guide – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016). Relevés were undertaken in accordance with the guide, and plant specimens collected when botanists were not able to identify plants in the field. Opportunistic sampling was undertaken between relevés to ensure the survey area was adequately sampled.
Completeness and further work which may be needed (e.g. was the relevant area fully surveyed)	**Not a limitation.** The survey area was adequately surveyed, with botanists covering the entire survey area.
Taxonomic certainty	**Not a limitation**. There were no significant limitations on taxonomic certainty. Species profiles, descriptions and photographs were compiled from specimens and information available on Florabase and resources in the WA Herbarium. These were used for field identification of any species with potential to be a threatened or priority species. Specimens were collected for all potential threatened and priority species and all unidentified plants (as encountered), for identification in the WA Herbarium.
Mapping reliability	**Not a limitation**. The vegetation mapping was based on the requirements outlined in the EPA Technical Guide for a detailed Flora and Vegetation. For planning and mapping purposes, detailed aerial imagery was provided by the Client.
Timing, weather, season, cycle	**Not a limitation**. The targeted survey was completed during the peak flowering period, on the 23rd November 2018. Annuals species were observable at the time of the survey.
Disturbances (fire, flood, accidental human intervention etc.)	**Not a Limitation.** While a large proportion of the survey area is Degraded due to the pressures of residential development, such as weeds and land clearing, this did not impede the survey
Intensity (in retrospect, was the intensity adequate)	**Not a limitation**. The intensity of the survey was adequate. By the end of the survey no new vegetation types and few new plant species were being encountered.
Resources	**Not a limitation**. The field survey, plant identification and reporting were all adequately resourced.
Experience levels (e.g. degree of expertise in plant identification to taxon level).	**Not a limitation**. The field survey was carried out by suitably qualified and experienced personnel with extensive experience over a range of botanical districts with specific experience working in Banksia woodlands and Jarrah Forest on the Swan Coastal Plain.

9 Conclusions and Recommendations

A large portion of the survey area (77.24%) was rated as either Degraded or Completely Degraded, and therefore has limited significant vegetation value. Two small pockets in Lots 103 and 350 were classified as in 'very good' condition. A map of the vegetation condition of the survey area can be found in **Figure 2**.

Two vegetation communities were identified during the survey. Type 1 vegetation was characterised as a granitic heathland community, with an overstorey of *Allocasuarina huegeliana* over a heathland of *Melaleuca,* Fabaceae and Proteaceae species. This was the main vegetation type in Lot 103, with some presence also in Lots 350 and 351. Type 2 vegetation was characterised as having an overstorey of *Corymbia calophylla* and *Eucalyptus wandoo,* with an open shrubland understorey consisting of species including *Calothamnus sanguineus, Hakea erinacea* and *Xanthorrhoea preissii.* The slopes of Lots 350 and 351 were dominated by Type 2 vegetation. None of the vegetation communities matched any description of Priority or Threatened Ecological Communities. A map of vegetation communities can be found in **Figure 1**.

No Threatened (Declared Rare) Flora were found during the survey. One Priority species, *Beaufortia purpurea*, was found throughout Vegetation Type 1 as a main understorey species. *B. purpurea* is a Priority 3 erect or spreading shrub, which grows from 0.3m-1.5m high. The species is found on rocky slopes or granitic soils and has red flowers from October to December. *B. purpurea* was found mainly in areas where vegetation was in 'very good' condition.

A total of 13 significant Black Cockatoo habitat trees were recorded within the survey area, with four trees possessing potential Black Cockatoo breeding hollows. Significant trees were all Marri (*Corymbia calophylla*) and Wandoo (*Eucalyptus wandoo*). Black Cockatoos were observed during the survey. Flora species that are known to be used by Black Cockatoos for breeding, foraging and roosting were identified during the survey. A map of the locations of significant habitat trees can be found in **Figure 3**.

Much of the survey area is densely infested with weed species. Most notably, *Watsonia meriana* var. *bulbillifera* was found across all vegetation communities. Other weed species included Fountain Grass (*Pennisetum setaceum*) and Common Wild Oats (*Avena fatua*). No Declared weeds under the BAM Act 2007 were found during the survey.

Terratree makes the following recommendations for future development on site:

- Ensure machinery entering site, especially earth-moving equipment is 'clean on entry' to the survey area i.e. free of soil and vegetative materials to prevent the introduction of weeds and pathogens;
- If significant populations of Priority flora are to be impacted, then every effort should be made to minimise impacts by demarcating populations prior to ground disturbance activities;
- Impacts to Black Cockatoo habitat should be focused on avoidance and mitigation, as per Table 2 in the EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (SEWPAC 2012). Specific recommendations for the survey area include:
    - Trees that provide significant habitat for Black Cockatoos should be retained if possible during construction; and
    - Avoidance and control of the introduction of pathogens and plant diseases during activities which may negatively impact retained or surrounding habitat of the development;

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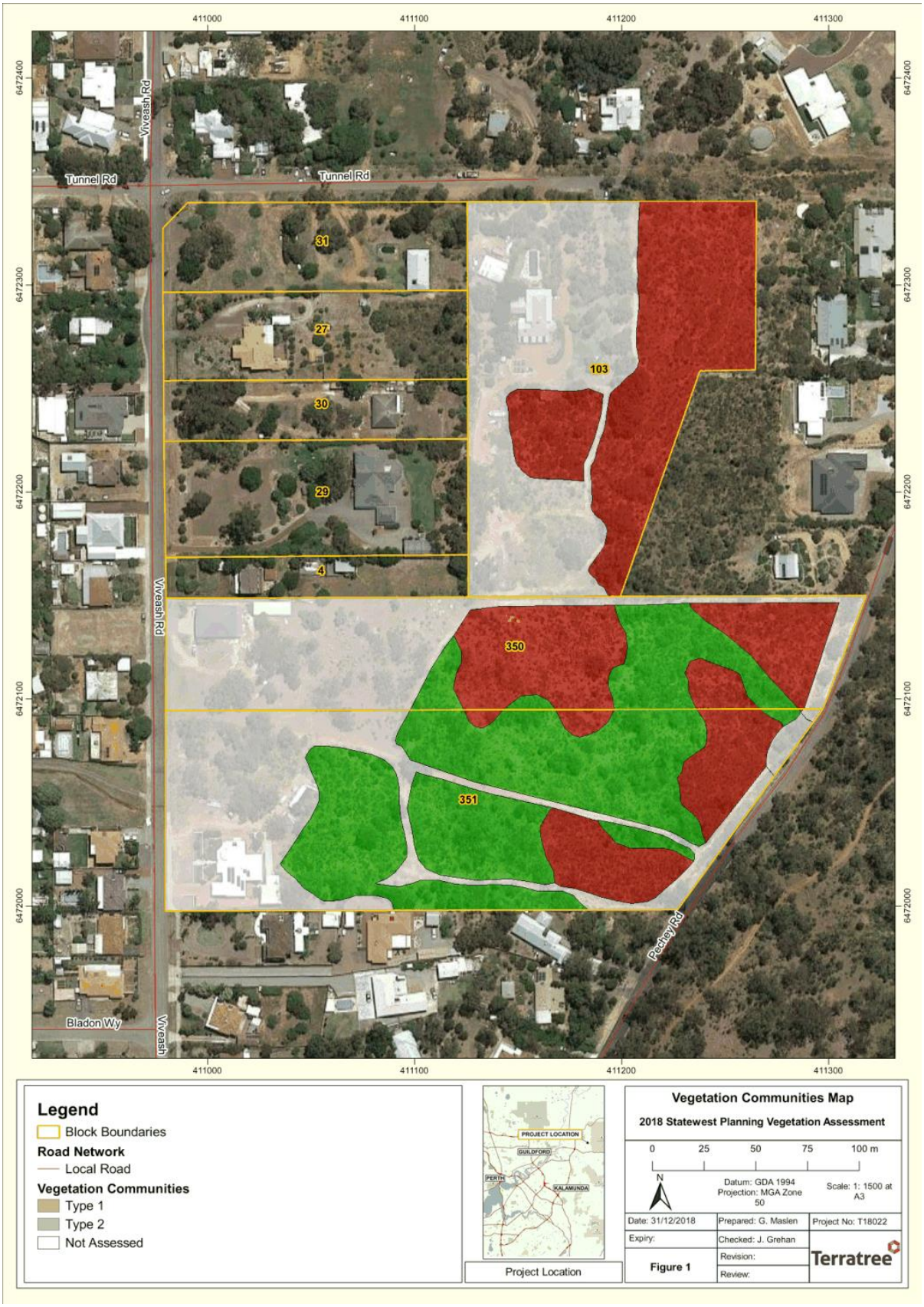
11 Figures

Figure 1: Vegetation Communities Map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Legend
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Local Road
Vegetation Communities
Type 1
Type 2
Not Assessed
PROJECT LOCATION
GUILDFORD
PERTH
KALAMUNDA
Project Location
Vegetation Communities Map
2018 Statewest Planning Vegetation Assessment
0 25 50 75 100 m
N
Datum: GDA 1994
Projection: MGA Zone 50
Scale: 1: 1500 at A3
Date: 31/12/2018
Prepared: G. Maslen
Project No: T18022
Expiry:
Checked: J. Grehan
Figure 1
Revision:
Review:
Terratree

Figure 2: Vegetation Condition Map

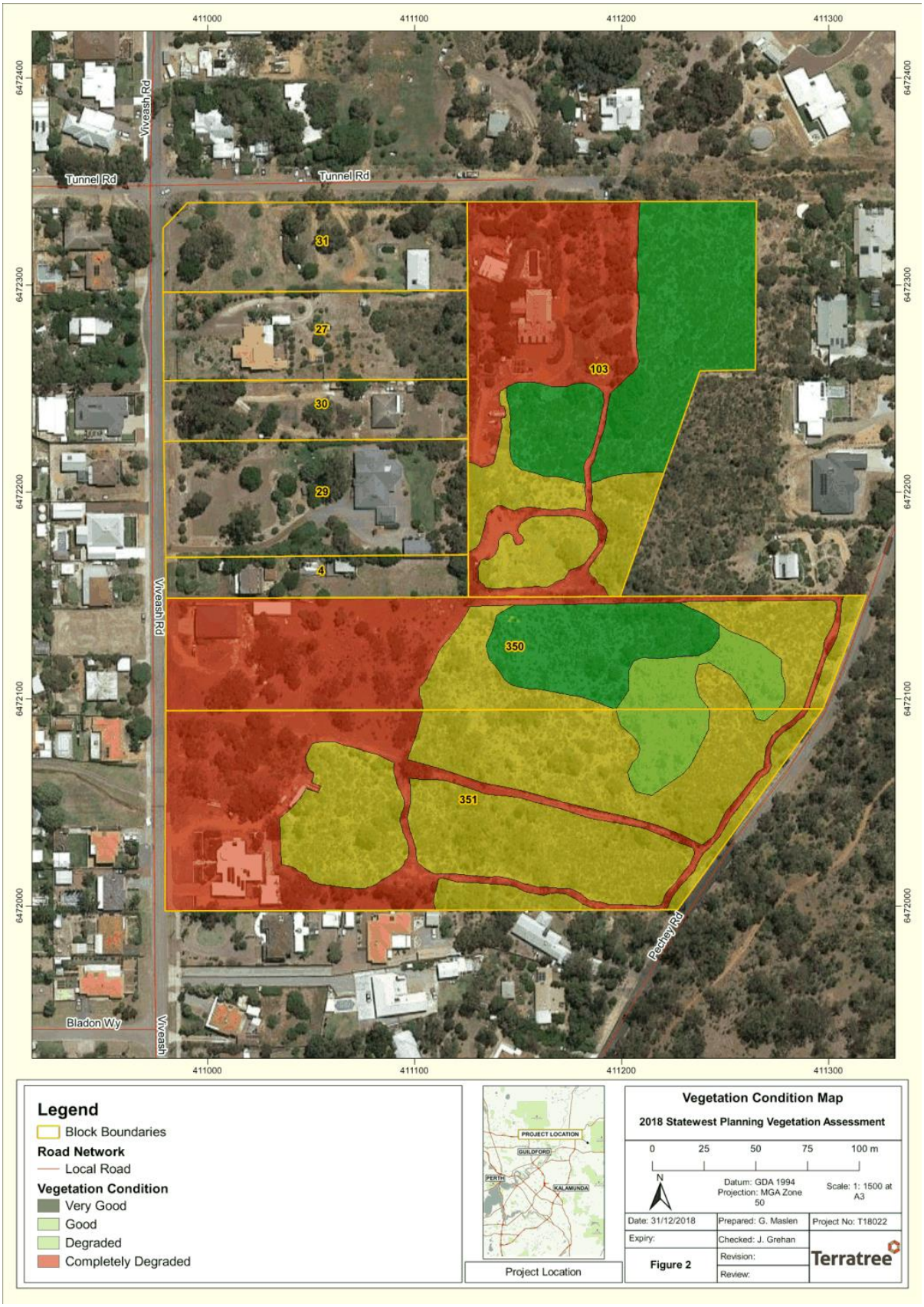
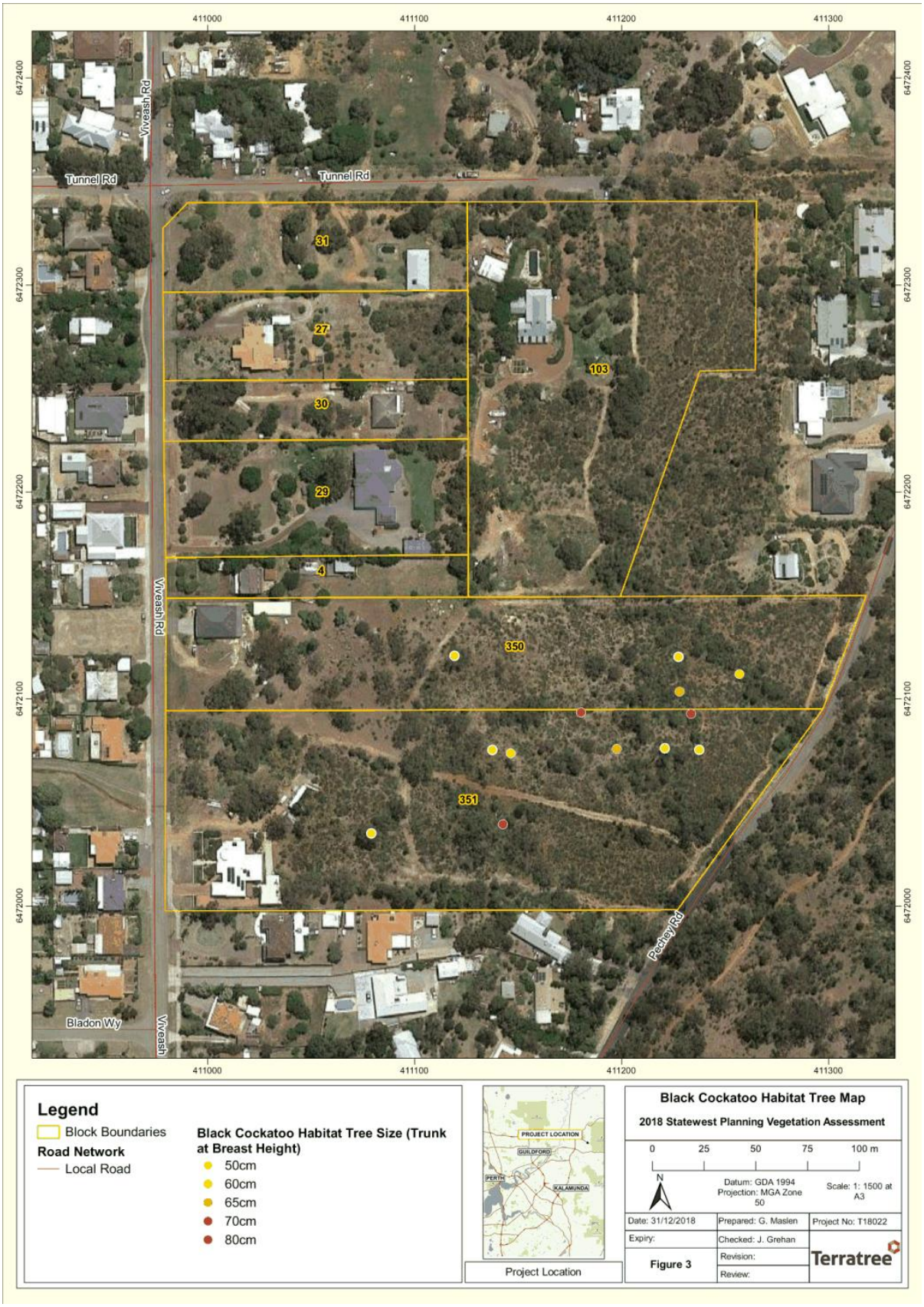

411000
411100
411200
411300
6472400
6472300
6472200
6472100
6472000
Viveash Rd
Tunnel Rd
Tunnel Rd
31
27
30
29
4
103
350
351
Viveash Rd
Viveash
Bladon Wy
Pedley Rd
Legend
Block Boundaries
Road Network
Local Road
Vegetation Condition
Very Good
Good
Degraded
Completely Degraded
PROJECT LOCATION
GUILDFORD
PERTH
KALAMUNDA
Project Location
Vegetation Condition Map
2018 Statewest Planning Vegetation Assessment
0
25
50
75
100 m
N
Datum: GDA 1994
Projection: MGA Zone 50
Scale: 1: 1500 at A3
Date: 31/12/2018
Prepared: G. Maslen
Project No: T18022
Expiry:
Checked: J. Grehan
Figure 2
Revision:
Review:
Terratree

Figure 3: Significant Fauna Habitat Trees Map


411000
411100
411200
411300
6472400
6472300
6472200
6472100
6472000
Viveash Rd
Tunnel Rd
Bladon Wy
Pedley Rd
31
27
30
29
4
103
350
351
Legend
Block Boundaries
Road Network
Local Road
Black Cockatoo Habitat Tree Size (Trunk at Breast Height)
50cm
60cm
65cm
70cm
80cm
PROJECT LOCATION
GUILDFORD
PERTH
KALAMUNDA
Project Location
Black Cockatoo Habitat Tree Map
2018 Statewest Planning Vegetation Assessment
0 25 50 75 100 m
N
Datum: GDA 1994
Projection: MGA Zone 50
Scale: 1: 1500 at A3
Date: 31/12/2018
Prepared: G. Maslen
Project No: T18022
Expiry:
Checked: J. Grehan
Figure 3
Revision:
Review:
Terratree

12 Plates

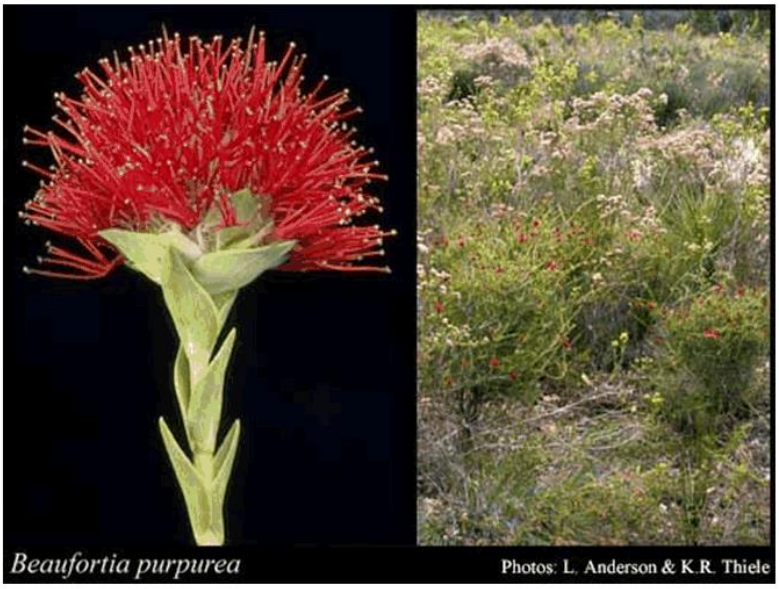


Plate 1: *Beaufortia purpurea* photo from Florabase (2018)

Plate 2: Degraded Vegetation within the Survey Area

Plate 3: Fountain Grass (*Pennisetum setaceum)* thickets in some areas in Lot 103.

Plate 4: *Watsonia meriana* var. *bulbillifera* is present through most of the survey area, with the species becoming the dominant understorey species in some areas of the survey area.

Plate 5: Potential Black Cockatoo Habitat Tree with Black Cockatoo pictured in background.

Appendices

Appendix A: EPBC Protected Matters Search Tool Report

Australian Government
Department of the Environment and Energy

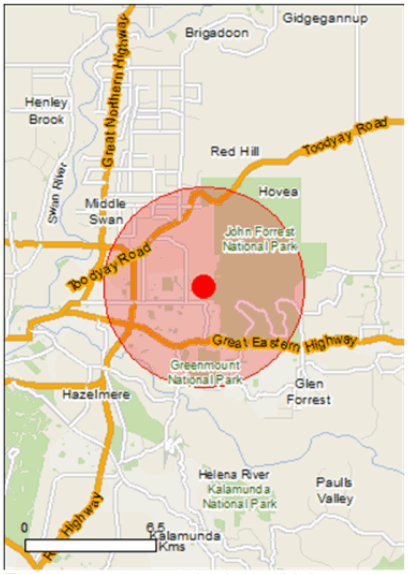
EPBC Act Protected Matters Report

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.

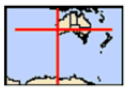
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 14/12/18 17:56:54



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

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:	3
Listed Threatened Species:	23
Listed Migratory Species:	9

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:	1
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:	5
Regional Forest Agreements:	1
Invasive Species:	35
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

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
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area
Shrublands and Woodlands of the eastern Swan Coastal Plain	Endangered	Community known to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
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
Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Roosting known to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	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
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat likely to occur within area
Other		

Name	Status	Type of Presence
Westralunio carteri		
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area
Plants		
Acacia aphylla		
Leafless Rock Wattle [13553]	Vulnerable	Species or species habitat known to occur within area
Andersonia gracilis		
Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
Anthocercis gracilis		
Slender Tailflower [11103]	Vulnerable	Species or species habitat known to occur within area
Diplolaena andrewsii		
[6601]	Endangered	Species or species habitat known to occur within area
Diuris micrantha		
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
Diuris purdiei		
Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Eleocharis keigheryi		
Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus x balanites		
Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area
Grevillea christineae		
Christine's Grevillea [64520]	Endangered	Species or species habitat likely to occur within area
Grevillea curviloba subsp. incurva		
Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
Synaphea sp. Fairbridge Farm (D. Papenfus 696)		
Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area
Thelymitra dedmaniarum		
Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat likely to occur within area
Thelymitra stellata		
Star Sun-orchid [7060]	Endangered	Species or species habitat likely to 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
Migratory Wetlands Species		

Name	Threatened	Type of Presence
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 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
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

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

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
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known 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 ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species

Name	Threatened	Type of Presence
		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
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	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
Greenmount	WA
John Forrest	WA
NTWA Bushland covenant (0074)	WA
Talbot Road	WA
Unnamed WA45106	WA

Regional Forest Agreements	[Resource Information]

Note that all areas with completed RFAs have been included.

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 Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		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
Capra hircus Goat [2]		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
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		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		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf		Species or species habitat likely to occur

Name	Status	Type of Presence
Madeiravine, Potato Vine [2643]		within area
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
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
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to 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
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		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

-31.88 116.06

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.

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Canberra ACT 2601 Australia
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Appendix B: NatureMap Species Report

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 22/11/2018

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 116° 03' 40" E,31° 52' 59" S
Buffer 5km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	1457	15985
Other specially protected fauna	1	4
Priority 3	12	91
Priority 4	8	150
Protected under international agreement	1	1
Rare or likely to become extinct	12	625
TOTAL	**1491**	**16856**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	3220	*Acacia aphylla (Leafless Rock Wattle)*		T	
2.	6946	*Anthocercis gracilis (Slender Tailflower)*		T	
3.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
4.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
5.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
6.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
7.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
8.	13653	*Calytrix breviseta subsp. breviseta*		T	
9.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
10.	4452	*Diplolaena andrewsii*		T	
11.	30751	*Synaphea sp. Pinjarra Plain (A.S. George 17182)*		T	
12.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Protected under international agreement					
13.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
Other specially protected fauna					
14.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Priority 3					
15.	14129	*Acacia oncinophylla subsp. oncinophylla*		P3	
16.	48574	*Australotomurus morbidus (cemetery springtail, Guildford springtail)*		P3	
17.	5390	*Beaufortia purpurea (Purple Beaufortia)*		P3	
18.	16245	*Cyathochaeta teretifolia*		P3	
19.	48579	*Euoplos inornatus (inornate trapdoor spider (northern Jarrah Forest))*		P3	
20.	6686	*Halgania corymbosa*		P3	
21.	29775	*Isopogon drummondii*		P3	
22.	45081	*Lasiopetalum glutinosum subsp. glutinosum*		P3	
23.	8163	*Pithocarpa corymbulosa (Corymbose Pithocarpa)*		P3	
24.	4540	*Tetratheca pilifera*		P3	
25.	1317	*Thysanotus anceps*		P3	
26.	12460	*Verticordia serrata var. linearis*		P3	
Priority 4					
27.	5396	*Calothamnus accedens*		P4	
28.	5523	*Darwinia pimelioides*		P4	
29.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
30.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
31.	5025	*Lasiopetalum bracteatum (Helena Velvet Bush)*		P4	
32.	2278	*Persoonia sulcata*		P4	
33.	8212	*Senecio leucoglossus*		P4	

NatureMap is a collaborative project of the Department of Parks and Wildlife and the Western Australian Museum.

Page 1

NatureMap
Mapping Western Australia's biodiversity

	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
34.	1334	*Thysanotus glaucus*		P4	
Non-conservation taxon					
35.	15429	*Acacia alata var. alata*			
36.	15466	*Acacia applanata*			
37.	3231	*Acacia auronitens*			
38.	3233	*Acacia barbinervis*			
39.	15469	*Acacia barbinervis subsp. barbinervis*			
40.	3294	*Acacia dentifera*			
41.	3323	*Acacia ericifolia*			
42.	3331	*Acacia extensa (Wiry Wattle)*			
43.	3374	*Acacia huegelii*			
44.	3382	*Acacia incrassata*			
45.	18217	*Acacia iteaphylla*	Y		
46.	18597	*Acacia longifolia subsp. sophorae*	Y		
47.	3442	*Acacia microbotrya (Manna Wattle, Kalyang)*			
48.	3454	*Acacia nervosa (Rib Wattle)*			
49.	3464	*Acacia obovata*			
50.	3502	*Acacia pulchella (Prickly Moses)*			
51.	15481	*Acacia pulchella var. glaberrima*			
52.	15482	*Acacia pulchella var. goadbyi*			
53.	15483	*Acacia pulchella var. pulchella*			
54.	3504	*Acacia pycnantha (Golden Wattle)*	Y		
55.	3527	*Acacia saligna (Orange Wattle, Kudjong)*			
56.	30033	*Acacia saligna subsp. lindleyi*			
57.	30034	*Acacia saligna subsp. pruinescens*			
58.	30032	*Acacia saligna subsp. saligna*			
59.	3541	*Acacia sessilis*			
60.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
61.	3574	*Acacia teretifolia*			
62.	3591	*Acacia urophylla*			
63.	3602	*Acacia willdenowiana (Grass Wattle)*			
64.	3184	*Acaena echinata (Sheep's Burr)*			
65.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
66.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
67.	24262	*Acanthiza inornata (Western Thornbill)*			
68.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
69.		*Acariformes sp.*			
70.	27574	*Acarospora citrina*			
71.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
72.	25536	*Accipiter fasciatus (Brown Goshawk)*			
73.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
74.		*Acroaspis olorina*			Y
75.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
76.	6203	*Actinotus glomeratus*			
77.	6205	*Actinotus leucocephalus (Flannel Flower)*			
78.	14970	*Adenanthos barbiger*			
79.	1775	*Adenanthos cygnorum (Common Woollybush)*			
80.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			
81.	25	*Adiantum aethiopicum (Common Maidenhair)*			
82.		*Aganippe cupulifex*			Y
83.		*Aganippe rhaphiduca*			
84.	23474	*Agrostocrinum hirsutum*			
85.	1261	*Agrostocrinum scabrum (Blue Grass Lily)*			
86.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
87.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
88.		*Akamptogonus novarae*			
89.	43820	*Albuca flaccida*	Y		
90.	1056	*Alexgeorgea nitens*			
91.	1377	*Allium porrum (Leek)*	Y		
92.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
93.	1731	*Allocasuarina huegeliana (Rock Sheoak, Kwowl)*			
94.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
95.		*Allocasuarina littoralis*			Y
96.	1734	*Allocasuarina microstachya*			
97.	2648	*Alternanthera denticulata (Lesser Joyweed)*			
98.	38755	*Amanita ochroterrea*			
99.	38756	*Amanita umbrinella*			
100.	2655	*Amaranthus albus (Tumbleweed)*	Y		
101.	2656	*Amaranthus caudatus (Love Lies Bleeding)*	Y		
102.		*Ambicodamus kochi*			

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	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
103.		*Amblyomma albolimbatum*			
104.		*Amblyomma fimbriatum*			
105.		*Amblyomma triguttatum*			
106.	6209	*Ammi majus (Bishop's Weed)*	Y		
107.	199	*Amphipogon strictus (Greybeard Grass)*			
108.	200	*Amphipogon turbinatus*			
109.		*Amphisopodidae sp.*			
110.	2380	*Amyema miquelii (Stalked Mistletoe)*			
111.	2383	*Amyema preissii (Wireleaf Mistletoe)*			
112.		*Aname mainae*			
113.		*Aname tepperi*			
114.	1058	*Anarthria gracilis*			
115.	1059	*Anarthria humilis*			
116.	1060	*Anarthria laevis*			
117.	24310	*Anas castanea (Chestnut Teal)*			
118.	24312	*Anas gracilis (Grey Teal)*			
119.	24313	*Anas platyrhynchos (Mallard)*			
120.	24315	*Anas rhynchotis (Australasian Shoveler)*			
121.	24316	*Anas superciliosa (Pacific Black Duck)*			
122.	6300	*Andersonia aristata (Rice Flower)*			
123.	6311	*Andersonia heterophylla*			
124.	6314	*Andersonia lehmanniana*			
125.	11471	*Andersonia lehmanniana subsp. lehmanniana*			
126.	6317	*Andersonia micrantha*			
127.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
128.	11470	*Anigozanthos bicolor subsp. bicolor*			
129.	1409	*Anigozanthos humilis (Catspaw)*			
130.	11434	*Anigozanthos humilis subsp. humilis*			
131.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
132.	11261	*Anigozanthos manglesii subsp. manglesii*			
133.	1416	*Anigozanthos viridis (Green Kangaroo Paw, Kurulbardang)*			
134.	11566	*Anigozanthos viridis subsp. viridis*			
135.	25319	*Antaresia stimsoni subsp. orientalis (Stimson's Python)*			
136.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
137.	25449	*Antechinus flavipes (Yellow-footed Antechinus)*			
138.	24088	*Antechinus flavipes subsp. leucogaster (Yellow-footed Antechinus, Mardo)*			
139.	11454	*Anthocercis anisantha subsp. anisantha*			
140.	24561	*Anthochaera carunculata (Red Wattlebird)*			
141.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
142.	1116	*Aphelia brizula*			
143.	1117	*Aphelia cyperoides*			
144.	1118	*Aphelia drummondii*			
145.	43548	*Aphelia sp. Albany (B.G. Briggs 596)*			
146.	24990	*Aprasia pulchella (Granite Worm-lizard)*			
147.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
148.	24285	*Aquila audax (Wedge-tailed Eagle)*			
149.		*Arachnura higginsi*			
150.		*Araneus cyphoxis*			
151.		*Araneus eburneiventris*			
152.		*Araneus ginninderranus*			
153.		*Araneus senicaudatus*			
154.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
155.	41324	*Ardea modesta (great egret, white egret)*			
156.	24341	*Ardea pacifica (White-necked Heron)*			
157.		*Argiope protensa*			
158.		*Argiope trifasciata*			
159.	207	*Aristida contorta (Bunched Kerosene Grass)*			
160.	222	*Aristida ramosa (Purple Wiregrass)*	Y		
161.	1264	*Amocrinum preissii*			
162.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
163.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
164.	24356	*Artamus personatus (Masked Woodswallow)*			
165.		*Artoria flavimana*			
166.		*Artoria linnaei*			
167.		*Artoriopsis expolita*			
168.		*Asadipus kunderang*			
169.	8779	*Asparagus asparagoides (Bridal Creeper)*	Y		
170.	1201	*Asparagus officinalis (Asparagus)*	Y		
171.	20249	*Astartea leptophylla (River-bank Astartea)*			
172.		*Asterella drummondii*			

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173.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
174.	4400	*Asterolasia pallida*			
175.	6323	*Astroloma ciliatum (Candle Cranberry)*			
176.	6334	*Astroloma pallidum (Kick Bush)*			
177.	6336	*Astroloma serratifolium (Kondrung)*			
178.	6337	*Astroloma stomarrhena (Red Swamp Cranberry)*			
179.	6339	*Astroloma xerophyllum*			
180.	48560	*Auritella chamaecephala*			
181.		*Austracantha minax*			
182.		*Australomimetus auriocultatus*			
183.		*Australomimetus ovidi*			
184.	33972	*Austromerope poultoni (earwigfly (southwest), scorpionfly)*			
185.	17233	*Austrostipa campylachne*			
186.	17234	*Austrostipa compressa*			
187.	17237	*Austrostipa elegantissima*			
188.	17240	*Austrostipa flavescens*			
189.	17245	*Austrostipa mollis*			
190.	17253	*Austrostipa semibarbata*			
191.	17257	*Austrostipa variabilis*			
192.	231	*Avellinia michelii*	Y		
193.	233	*Avena barbata (Bearded Oat)*	Y		
194.	234	*Avena fatua (Wild Oat)*	Y		
195.	24318	*Aythya australis (Hardhead)*			
196.	18279	*Babiana angustifolia*	Y		
197.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
198.		*Backobourkia brounii*			
199.		*Backobourkia heroine*			
200.	1382	*Baeometra uniflora*	Y		
201.		*Baetidae sp.*			
202.		*Baiami volucripes*			
203.		*Ballarra longipalpus*			
204.	32682	*Banksia armata var. armata*			
205.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
206.	32678	*Banksia bipinnatifida subsp. bipinnatifida*			
207.	32580	*Banksia dallanneyi var. dallanneyi*			
208.	32577	*Banksia dallanneyi var. mellicula*			
209.	1819	*Banksia grandis (Bull Banksia, Pulgarla)*			
210.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
211.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
212.	1834	*Banksia menziesii (Firewood Banksia)*			
213.	32080	*Banksia sessilis var. sessilis*			
214.	32054	*Banksia undata var. undata*			
215.	32315	*Barbula calycina*			
216.		*Barnardius zonarius*			
217.	15037	*Bartsia trixago*	Y		
218.	744	*Baumea laxa*			
219.	746	*Baumea riparia*			
220.	747	*Baumea rubiginosa*			
221.	748	*Baumea vaginalis (Sheath Twigrush)*			
222.	5387	*Beaufortia macrostemon (Darling Range Beaufortia)*			
223.	4598	*Beyeria lechenaultii (Pale Turpentine Bush)*			
224.		*Bigenditia zuytdorp*			
225.	3157	*Billardiera floribunda (White-flowered Billardiera)*			
226.	25788	*Billardiera fraseri (Elegant Pronaya)*			
227.	25798	*Billardiera fusiformis (Australian Bluebell)*			
228.	25796	*Billardiera heterophylla (Australian Bluebell)*			
229.	24319	*Biziura lobata (Musk Duck)*			
230.		*Boletellus obscurecoccineus*			
231.	4414	*Boronia cymosa (Granite Boronia)*			
232.	4432	*Boronia ovata*			
233.	4438	*Boronia ramosa*			
234.	11381	*Boronia ramosa subsp. anethifolia*			
235.	11564	*Boronia ramosa subsp. ramosa*			
236.	1267	*Borya constricta*			
237.	1272	*Borya scirpoidea*			
238.	1273	*Borya sphaerocephala (Pincushions)*			
239.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
240.	3714	*Bossiaea ornata (Broad Leaved Brown Pea)*			
241.	3717	*Bossiaea pulchella*			
242.	18497	*Bossiaea sp. Waroona (B.J. Keighery & N. Gibson 229)*			

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243.	3719	*Bossiaea spinescens*			
244.	8661	*Brachypodium distachyon (False Brome)*	Y		
245.	7878	*Brachyscome iberidifolia*			
246.	7882	*Brachyscome perpusilla*			
247.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
248.	2997	*Brassica oleracea*	Y		
249.		*Brentidae sp.*			
250.	244	*Briza maxima (Blowfly Grass)*	Y		
251.	245	*Briza minor (Shivery Grass)*	Y		
252.	248	*Bromus catharticus (Prairie Grass)*	Y		
253.	250	*Bromus hordeaceus (Soft Brome)*	Y		
254.	41242	*Buellia homophylia*			
255.	12770	*Burchardia congesta*			
256.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
257.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
258.	25716	*Cacatua sanguinea (Little Corella)*			
259.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
260.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
261.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
262.		*Caenidae sp.*			
263.	1276	*Caesia micrantha (Pale Grass Lily)*			
264.	15330	*Caladenia arenicola*			
265.	11136	*Caladenia denticulata*			
266.	1586	*Caladenia discoidea (Dancing Orchid)*			
267.	1592	*Caladenia flava (Cowslip Orchid)*			
268.	15348	*Caladenia flava subsp. flava*			
269.	15502	*Caladenia footeana*			
270.	17980	*Caladenia hiemalis*			
271.	15354	*Caladenia hirta subsp. hirta*			
272.	1602	*Caladenia longicauda (Common White Spider Orchid)*			
273.	15363	*Caladenia longicauda subsp. eminens*			
274.	15365	*Caladenia longicauda subsp. longicauda*			
275.	1603	*Caladenia longiclavata (Clubbed Spider Orchid)*			
276.	1604	*Caladenia macrostylis (Leaping Spider Orchid)*			
277.	1605	*Caladenia marginata (White Fairy Orchid)*			
278.	15503	*Caladenia paludosa*			
279.	15377	*Caladenia reptans subsp. reptans*			
280.	19309	*Calectasia narragara*			
281.	10861	*Callistachys lanceolata (Wonnich)*			
282.	5395	*Callistemon phoeniceus (Lesser Bottlebrush, Dubarda)*			
283.	8466	*Callitris columellaris (White Cypress Pine)*			
284.		*Caloplaca sp.*			
285.	5411	*Calothamnus hirsutus*			
286.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush, Kwowdjard)*			
287.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
288.	5428	*Calothamnus rupestris (Mouse Ears)*			
289.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
290.	5431	*Calothamnus torulosus*			
291.	5434	*Calothamnus villosus*			
292.	7902	*Calotis erinacea (Tangled Burr-daisy)*			
293.	16492	*Calycopeplus paucifolius*			
294.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
295.	5437	*Calytrix acutifolia*			
296.	5439	*Calytrix angulata (Yellow Starflower)*			
297.	5441	*Calytrix aurea*			
298.	5450	*Calytrix depressa*			
299.	5461	*Calytrix glutinosa*			
300.	5485	*Calytrix variabilis*			
301.	32334	*Campylopus australis*			
302.	32338	*Campylopus introflexus*	Y		
303.		*Carabidae sp.*			
304.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
305.	11857	*Cassytha glabella forma glabella*			
306.	2954	*Cassytha micrantha*			
307.	2956	*Cassytha pomiformis (Dodder Laurel)*			
308.	2957	*Cassytha racemosa (Dodder Laurel)*			
309.	11799	*Cassytha racemosa forma racemosa*			
310.	18314	*Casuarina cunninghamiana subsp. cunninghamiana*	Y		
311.	1742	*Casuarina obesa (Swamp Sheoak, Kuli)*			
312.	760	*Caustis dioica*			

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313.		*Ceinidae sp.*			
314.	41566	*Cenchrus longisetus (Feathertop)*	Y		
315.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
316.	6539	*Centaurium erythraea (Common Centaury)*	Y		
317.	6542	*Centaurium tenuiflorum*	Y		
318.	7366	*Centranthus macrosiphon*	Y		
319.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
320.	13122	*Centrolepis cephaloformis subsp. cephaloformis*			
321.	1125	*Centrolepis drummondiana*			
322.	1131	*Centrolepis inconspicua*			
323.	1133	*Centrolepis pilosa*			
324.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
325.	32462	*Ceratodon purpureus subsp. convolutus*			
326.		*Ceratopogonidae sp.*			
327.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
328.		*Cercophonius granulosus*			
329.		*Cercophonius sulcatus*			
330.		*Ceryerda curaitana*			
331.		*Cethegus fugax*			
332.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
333.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
334.	18156	*Chamaecytisus palmensis (Tagasaste)*	Y		
335.	1280	*Chamaescilla corymbosa (Blue Squill)*			
336.	11299	*Chamaescilla corymbosa var. corymbosa*			
337.	1281	*Chamaescilla spiralis*			
338.	8788	*Chamaescilla versicolor*			
339.	1217	*Chamaexeros serra (Little Fringe-leaf)*			
340.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
341.	1513	*Chasmanthe floribunda (African Comflag)*	Y		
342.	31	*Cheilanthes austrotenuifolia*			
343.	34	*Cheilanthes distans (Bristly Cloak Fern)*			
344.	12818	*Cheilanthes sieberi subsp. sieberi*			
345.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
346.		*Chironominae sp.*			
347.	763	*Chorizandra enodis (Black Bristlerush)*			
348.	764	*Chorizandra multiarticulata*			
349.	8971	*Chorizema cordatum*			
350.	3753	*Chorizema dicksonii (Yellow-eyed Flame Pea)*			
351.	24980	*Christinus marmoratus (Marbled Gecko)*			
352.		*Chroicocephalus novaehollandiae*			
353.	11900	*Chrysanthemoides monilifera subsp. monilifera*	Y		
354.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
355.	24288	*Circus approximans (Swamp Harrier)*			
356.	24289	*Circus assimilis (Spotted Harrier)*			
357.	27663	*Cladia aggregata*			
358.	27665	*Cladia ferdinandii*			
359.	27668	*Cladia schizopora*			
360.	28208	*Cladonia cervicornis subsp. verticillata*			
361.	27694	*Cladonia southlandica*			
362.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
363.	2929	*Clematis pubescens (Common Clematis)*			
364.		*Clynotis severus*			
365.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
366.		*Coltricia cinnamomea*			
367.	24399	*Columba livia (Domestic Pigeon)*	Y		
368.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
369.	4564	*Comesperma virgatum (Milkwort)*			
370.	48634	*Commersonia comiculata*			
371.	1857	*Conospermum acerosum (Needle-leaved Smokebush)*			
372.	15607	*Conospermum acerosum subsp. acerosum*			
373.	1874	*Conospermum glumaceum (Hooded Smokebush)*			
374.	1875	*Conospermum huegelii (Slender Smokebush)*			
375.	1876	*Conospermum incurvum (Plume Smokebush)*			
376.	1882	*Conospermum stoechadis (Common Smokebush)*			
377.	15520	*Conospermum stoechadis subsp. sclerophyllum*			
378.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
379.	6348	*Conostephium pendulum (Pearl Flower)*			
380.	6349	*Conostephium preissii*			
381.	1418	*Conostylis aculeata (Prickly Conostylis)*			
382.	11826	*Conostylis aculeata subsp. aculeata*			

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383.	11513	*Conostylis aculeata subsp. cygnorum*			
384.	1420	*Conostylis androstemma (Trumpets)*			
385.	1423	*Conostylis aurea (Golden Conostylis)*			
386.	11438	*Conostylis candicans subsp. candicans*			
387.	1429	*Conostylis canicina*			
388.	12035	*Conostylis canicina subsp. canicina*			
389.	1436	*Conostylis juncea*			
390.	1454	*Conostylis setigera (Bristly Cottonhead)*			
391.	11597	*Conostylis setigera subsp. setigera*			
392.	1455	*Conostylis setosa (White Cottonhead)*			
393.	6614	*Convolvulus remotus*			
394.		*Conyza sp.*			
395.	20074	*Conyza sumatrensis*	Y		
396.	24361	*Coracina maxima (Ground Cuckoo-shrike)*			
397.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
398.		*Cordullidae sp.*			
399.	44528	*Coreopsis lanceolata (Common Tickseed, Showy Tickseed, Garden Coreopsis)*	Y		
400.		*Corixidae sp.*			
401.		*Cormocephalus aurantiipes*			
402.		*Cormocephalus rubriceps*			
403.		*Cormocephalus strigosus*			
404.		*Cormocephalus turneri*			
405.	2891	*Corrigiola litoralis (Strapwort)*	Y		
406.	48259	*Cortaderia selloana subsp. selloana*	Y		
407.		*Cortinarius erythraeus*			
408.	24416	*Corvus bennetti (Little Crow)*			
409.	25592	*Corvus coronoides (Australian Raven)*			
410.	17104	*Corymbia calophylla (Marri)*			
411.	1285	*Corynotheca micrantha (Sand Lily)*			
412.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
413.	25595	*Cracticus tibicen (Australian Magpie)*			
414.	25596	*Cracticus torquatus (Grey Butcherbird)*			
415.	13354	*Craspedia variabilis*			
416.	17701	*Crassula closiana*			
417.	3137	*Crassula colorata (Dense Stonecrop)*			
418.	11349	*Crassula decumbens var. decumbens*			
419.	3139	*Crassula exserta*			
420.	20271	*Crassula extrorsa*			
421.	3142	*Crassula natans*	Y		
422.	3144	*Crassula peduncularis (Purple Stonecrop)*			
423.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
424.	29054	*Crepis foetida subsp. foetida (Stinking Hawksbeard)*	Y		
425.	25398	*Crinia georgiana (Quacking Frog)*			
426.	25399	*Crinia glauerti (Clicking Frog)*			
427.	25400	*Crinia insignifera (Squelching Froglet)*			
428.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
429.	19861	*Cristonia biloba*			
430.	35838	*Cristonia biloba subsp. biloba*			
431.	4792	*Cryptandra arbutiflora (Waxy Cryptandra)*			
432.	13470	*Cryptandra arbutiflora var. arbutiflora*			
433.	9076	*Cryptandra myriantha*			
434.	4804	*Cryptandra nutans*			
435.	4809	*Cryptandra pungens*			
436.	4810	*Cryptandra scoparia*			
437.	30893	*Cryptoblepharus buchananii*			
438.	24883	*Ctenophorus ornatus (Ornate Crevice-Dragon)*			
439.	25039	*Ctenotus fallens*			
440.	25047	*Ctenotus impar*			
441.	25049	*Ctenotus labillardieri*			
442.	7372	*Cucumis myriocarpus (Prickly Paddy Melon)*	Y		
443.		*Curculionidae sp.*			
444.	15114	*Cyanicula gemmata*			
445.	15404	*Cyanicula sericea*			
446.	768	*Cyathochaeta avenacea*			
447.	769	*Cyathochaeta clandestina*			
448.		*Cyclosa trilobata*			
449.	40660	*Cycnogeton huegelii*			
450.	40661	*Cycnogeton lineare*			
451.	24322	*Cygnus atratus (Black Swan)*			
452.	281	*Cymbopogon obtectus (Silkyheads)*			

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	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
453.	283	*Cynodon dactylon (Couch)*	Y		
454.	285	*Cynosurus echinatus (Rough Dogstail)*	Y		
455.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
456.	806	*Cyperus polystachyos (Bunchy Sedge)*			
457.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
458.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
459.		*Cyrtophora parnasia*			
460.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
461.	7420	*Dampiera alata (Winged-stem Dampiera)*			
462.	7428	*Dampiera coronata (Wedge-leaved Dampiera)*			
463.	7451	*Dampiera lavandulacea*			
464.	7453	*Dampiera lindleyi*			
465.	7454	*Dampiera linearis (Common Dampiera)*			
466.	7462	*Dampiera pedunculata*			
467.	7484	*Dampiera trigona (Angled-stem Dampiera)*			
468.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
469.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
470.	5531	*Darwinia thymoides*			
471.	18193	*Darwinia thymoides subsp. thymoides*			
472.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
473.	6218	*Daucus glochidiatus (Australian Carrot)*			
474.	3793	*Daviesia angulata*			
475.	3799	*Daviesia cordata (Bookleaf)*			
476.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			
477.	19747	*Daviesia decurrens subsp. decurrens*			
478.	18560	*Daviesia divaricata subsp. divaricata*			
479.	11879	*Daviesia hakeoides subsp. hakeoides*			
480.	12326	*Daviesia hakeoides subsp. subnuda*			
481.	3815	*Daviesia horrida (Prickly Bitter-pea)*			
482.	3819	*Daviesia longifolia*			
483.	16585	*Daviesia nudiflora subsp. nudiflora*			
484.	3831	*Daviesia pedunculata*			
485.	3832	*Daviesia physodes*			
486.	3833	*Daviesia podophylla*			
487.	3834	*Daviesia polyphylla*			
488.	3835	*Daviesia preissii*			
489.	3839	*Daviesia rhombifolia*			
490.	3845	*Daviesia triflora*			
491.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
492.	17663	*Desmocladus asper*			
493.	17691	*Desmocladus fasciculatus*			
494.	16595	*Desmocladus flexuosus*			
495.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
496.	11636	*Dianella revoluta var. divaricata*			
497.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
498.	306	*Dichelachne crinita (Longhair Plumegrass)*			
499.	1287	*Dichopogon capillipes*			
500.	1289	*Dichopogon preissii*			
501.	32346	*Didymodon torquatus*			
502.		*Dingosa serrata*			
503.		*Dinocambala ingens*			
504.	1509	*Dioscorea hastifolia (Warrine, Wararn)*			
505.	24929	*Diplodactylus granariensis subsp. granariensis*			
506.	24939	*Diplodactylus polyophthalmus*			
507.	9027	*Diplolaena drummondii*			
508.	4746	*Diplopeltis huegelii*			
509.	18589	*Diplopeltis huegelii subsp. lehmannii*			
510.	19649	*Disa bracteata*	Y		
511.	7055	*Dischisma capitatum (Woolly-headed Dischisma)*	Y		
512.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
513.	12943	*Diuris brumalis*			
514.	11049	*Diuris corymbosa*			
515.	1634	*Diuris laxiflora (Bee Orchid)*			
516.	1635	*Diuris longifolia (Common Donkey Orchid)*			
517.	12939	*Diuris magnifica*			
518.	46859	*Diuris ostrina*			
519.	15436	*Diuris porrifolia*			
520.	4757	*Dodonaea ceratocarpa*			
521.	4761	*Dodonaea ericoides*			
522.	4782	*Dodonaea viscosa (Sticky Hopbush)*			

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523.	15406	*Drakaea gracilis*			
524.	24470	*Dromaius novaehollandiae (Emu)*			
525.	3092	*Drosera bulbosa (Red-leaved Sundew)*			
526.	48724	*Drosera collina*			
527.	13218	*Drosera erythrogyne*			
528.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
529.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
530.	3101	*Drosera heterophylla (Swamp Rainbow)*			
531.	3105	*Drosera leucoblasta (Wheel Sundew)*			
532.	3106	*Drosera macrantha (Bridal Rainbow)*			
533.	14298	*Drosera macrantha subsp. macrantha*			
534.	3109	*Drosera menziesii (Pink Rainbow)*			
535.	11853	*Drosera menziesii subsp. menziesii*			
536.	3110	*Drosera microphylla (Golden Rainbow)*			
537.	15710	*Drosera miniata (Orange Sundew)*			
538.	3113	*Drosera neesii (Jewel Rainbow)*			
539.	3118	*Drosera pallida (Pale Rainbow)*			
540.	29178	*Drosera porrecta*			
541.	3125	*Drosera pycnoblasta (Pearly Sundew)*			
542.	8911	*Drosera rosulata*			
543.		*Drosera sp.*			
544.	3131	*Drosera stolonifera (Leafy Sundew)*			
545.	3132	*Drosera stricticaulis (Erect Sundew)*			
546.	13205	*Drosera tubaestylis*			
547.		*Dugesiidae sp.*			
548.	33480	*Dysphania pumilio (Clammy Goosefoot)*			
549.		*Dytiscidae sp.*			
550.	32351	*Eccremidium pulchellum*			
551.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
552.		*Egretta novaehollandiae*			
553.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
554.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
555.		*Elanus axillaris*			
556.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
557.	822	*Eleocharis acuta (Common Spikerush)*			
558.	353	*Eleusine indica (Crowsfoot Grass)*	Y		
559.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
560.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
561.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
562.		*Eodelena lapidicola*			
563.		*Eolophus roseicapillus*			
564.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
565.	374	*Eragrostis cilianensis (Stinkgrass)*	Y		
566.	376	*Eragrostis curvula (African Lovegrass)*	Y		
567.	379	*Eragrostis elongata (Clustered Lovegrass)*			
568.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
569.	5540	*Eremaea fimbriata*			
570.	5541	*Eremaea pauciflora*			
571.	14104	*Eremaea pauciflora var. pauciflora*			
572.	415	*Eriachne ovata*			
573.	20718	*Ericksonella saccharata*			
574.	45215	*Ericomyrtus tenuior*			
575.	15412	*Eriochilus dilatatus subsp. multiflorus*			
576.	15413	*Eriochilus dilatatus subsp. undulatus*			
577.	15415	*Eriochilus scaber subsp. scaber*			
578.		*Eriophora biapicata*			
579.		*Eriophora pustulosa*			
580.	4332	*Erodium botrys (Long Storksbill)*	Y		
581.	4336	*Erodium moschatum (Musky Crowfoot)*	Y		
582.	6219	*Eryngium pinnatifidum (Blue Devils)*			
583.	15446	*Eryngium pinnatifidum subsp. pinnatifidum*			
584.	5545	*Eucalyptus accedens (Powderbark Wandoo)*			
585.	5688	*Eucalyptus laeliae (Darling Range Ghost Gum)*			
586.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
587.	5739	*Eucalyptus patens (Swan River Blackbutt, Dwuda)*			
588.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
589.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
590.	5797	*Eucalyptus wandoo (Wandoo, Wondu)*			
591.	12906	*Eucalyptus wandoo subsp. wandoo*			
592.	3872	*Euchilopsis linearis (Swamp Pea)*			

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593.		*Eupograpta kottae*			
594.	25621	*Falco berigora (Brown Falcon)*			
595.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
596.	25623	*Falco longipennis (Australian Hobby)*			
597.	24474	*Falco longipennis subsp. longipennis (Australian Hobby)*			
598.	11445	*Ferraria crispa subsp. crispa*	Y		
599.	430	*Festuca arundinacea (Tall Fescue)*	Y		
600.	1747	*Ficus carica (Common Fig)*	Y		
601.	18392	*Freesia alba x leichtlinii*	Y		
602.	25727	*Fulica atra (Eurasian Coot)*			
603.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
604.	900	*Gahnia aristata*			
605.	34028	*Galaxias occidentalis (Western Minnow)*			
606.	7321	*Galium divaricatum*	Y		
607.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
608.	434	*Gastridium phleoides (Nitgrass)*	Y		
609.	3887	*Gastrolobium acutum*			
610.	3891	*Gastrolobium bilobum (Heart Leaf Poison)*			
611.	3895	*Gastrolobium calycinum (York Road Poison)*			
612.	20475	*Gastrolobium capitatum*			
613.	20513	*Gastrolobium dilatatum*			
614.	20473	*Gastrolobium ebracteolatum*			
615.	3899	*Gastrolobium epacridoides*			
616.	3912	*Gastrolobium oxylobioides (Champion Bay Poison)*			
617.	10981	*Gastrolobium parviflorum*			
618.	19733	*Gastrolobium retusum*			
619.	3923	*Gastrolobium spathulatum (Poison Bush)*			
620.	3924	*Gastrolobium spinosum (Prickly Poison)*			
621.	3933	*Gastrolobium villosum (Crinkle-leaved Poison)*			
622.		*Gea theridioides*			
623.	24959	*Gehyra variegata*			
624.	25404	*Geocrinia leai (Ticking Frog)*			
625.	24401	*Geopelia cuneata (Diamond Dove)*			
626.	4340	*Geranium retrorsum*			
627.	25530	*Gerygone fusca (Western Gerygone)*			
628.	1517	*Gladiolus alatus*	Y		
629.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
630.	20854	*Gladiolus watsonius*	Y		
631.	33620	*Glischrocaryon angustifolium*			
632.	6143	*Glischrocaryon aureum (Common Popflower)*			
633.		*Glossiphoniidae sp.*			
634.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
635.		*Gomphidae sp.*			
636.	3945	*Gompholobium aristatum*			
637.	10909	*Gompholobium confertum*			
638.	3950	*Gompholobium knightianum*			
639.	3951	*Gompholobium marginatum*			
640.	3953	*Gompholobium ovatum*			
641.	3954	*Gompholobium polymorphum*			
642.	3955	*Gompholobium preissii*			
643.	3956	*Gompholobium shuttleworthii*			
644.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
645.	6149	*Gonocarpus cordiger*			
646.	6159	*Gonocarpus nodulosus*			
647.	6161	*Gonocarpus pithyoides*			
648.	8614	*Goodenia claytoniacea*			
649.	29362	*Goodenia coerulea*			
650.	12520	*Goodenia fasciculata*			
651.	12551	*Goodenia micrantha*			
652.	7538	*Goodenia pulchella*			
653.	13165	*Goodenia pusilla*			
654.	24443	*Grallina cyanoleuca (Magpie-lark)*			
655.	37500	*Grammatotheca bergiana var. bergiana*	Y		
656.	14282	*Gratiola pubescens*			
657.	1964	*Grevillea bipinnatifida (Fuchsia Grevillea)*			
658.	19628	*Grevillea bipinnatifida subsp. bipinnatifida*			
659.	1965	*Grevillea bitemata*			
660.	13429	*Grevillea diversifolia subsp. diversifolia*			
661.	1997	*Grevillea endlicheriana (Spindly Grevillea)*			
662.	13450	*Grevillea manglesii subsp. manglesii*			

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663.	2056	*Grevillea paniculata*			
664.	2066	*Grevillea pilulifera (Woolly-flowered Grevillea)*			
665.	15990	*Grevillea pulchella subsp. ascendens*			
666.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
667.	2101	*Grevillea synapheae (Catkin Grevillea)*			
668.	14421	*Grevillea synapheae subsp. synapheae*			
669.	12824	*Grevillea vestita subsp. vestita*			
670.	2122	*Grevillea wilsonii (Native Fuchsia)*			
671.	32386	*Grimmia laevigata*			
672.		*Gripopterygidae sp.*			
673.	1464	*Haemodorum brevisepalum*			
674.	1465	*Haemodorum discolor*			
675.	1468	*Haemodorum laxum*			
676.	1472	*Haemodorum simplex*			
677.	1473	*Haemodorum simulans*			
678.		*Haemodorum sp.*			
679.	1475	*Haemodorum spicatum (Mardja)*			
680.	2128	*Hakea amplexicaulis (Prickly Hakea)*			
681.	2131	*Hakea auriculata*			
682.	2136	*Hakea candolleana*			
683.	2149	*Hakea cristata (Snail Hakea)*			
684.	2152	*Hakea cyclocarpa (Ramshorn)*			
685.	2158	*Hakea erinacea (Hedge-hog Hakea)*			
686.	2166	*Hakea incrassata (Marble Hakea)*			
687.	2175	*Hakea lissocarpha (Honey Bush)*			
688.	2185	*Hakea myrtoides (Myrtle Hakea)*			
689.	45333	*Hakea neospathulata*			
690.	2197	*Hakea prostrata (Harsh Hakea)*			
691.	2203	*Hakea ruscifolia (Candle Hakea)*			
692.	2206	*Hakea stenocarpa (Narrow-fruited Hakea)*			
693.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
694.	2215	*Hakea undulata (Wavy-leaved Hakea)*			
695.	2216	*Hakea varia (Variable-leaved Hakea)*			
696.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
697.	24295	*Haliastur sphenurus (Whistling Kite)*			
698.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
699.	25408	*Heleioporus albopunctatus (Western Spotted Frog)*			
700.	25409	*Heleioporus barycragus (Hooting Frog)*			
701.	25410	*Heleioporus eyrei (Moaning Frog)*			
702.	25412	*Heleioporus psammophilus (Sand Frog)*			
703.	6838	*Hemiandra linearis (Speckled Snakebush)*			
704.	6839	*Hemiandra pungens (Snakebush)*			
705.		*Hemicordulidae sp.*			
706.	25115	*Hemiergis initialis subsp. initialis*			
707.	6856	*Hemigenia incana (Silky Hemigenia)*			
708.	29632	*Hemigenia parviflora*			
709.	6871	*Hemigenia sericea (Silky Hemigenia)*			
710.	29397	*Hertelidea pseudobotryosa*			Y
711.	1526	*Hesperantha falcata*	Y		
712.		*Heurodes turritus*			
713.	5108	*Hibbertia acerosa (Needle Leaved Guinea Flower)*			
714.	5109	*Hibbertia amplexicaulis*			
715.	5112	*Hibbertia aurea*			
716.	5114	*Hibbertia commutata*			
717.	20051	*Hibbertia diamesogenos*			
718.	5134	*Hibbertia huegelii*			
719.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
720.	45534	*Hibbertia hypericoides subsp. hypericoides*			
721.	5150	*Hibbertia nymphaea*			
722.	5152	*Hibbertia ovata*			
723.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
724.	5169	*Hibbertia serrata (Serrate Leaved Guinea Flower)*			
725.	5171	*Hibbertia spicata*			
726.	48381	*Hibbertia striata*			
727.	5173	*Hibbertia subvaginata*			
728.	48241	*Hibiscus diversifolius subsp. diversifolius*	Y		
729.	47965	*Hieraaetus morphnoides (Little Eagle)*			
730.	25734	*Himantopus himantopus (Black-winged Stilt)*			
731.	24491	*Hirundo neoxena (Welcome Swallow)*			
732.		*Hoggicosa storri*			

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733.		*Holasteron perth*			
734.		*Holconia westralia*			
735.	6222	*Homalosciadium homalocarpum*			
736.	3964	*Hovea chorizemifolia (Holly-leaved Hovea)*			
737.	3966	*Hovea pungens (Devil's Pins, Puyenak)*			
738.	3968	*Hovea trisperma (Common Hovea)*			
739.	12741	*Hyalosperma cotula*			
740.	12742	*Hyalosperma demissum*			
741.	5216	*Hybanthus calycinus (Wild Violet)*			
742.	5221	*Hybanthus floribundus*			
743.	12007	*Hybanthus floribundus subsp. floribundus*			
744.	6223	*Hydrocotyle alata*			
745.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
746.	6229	*Hydrocotyle diantha*			
747.	6236	*Hydrocotyle pilifera*			
748.	11847	*Hydrocotyle pilifera var. pilifera*			
749.		*Hydroptilidae sp.*			
750.	5180	*Hypericum gramineum (Small St John's Wort)*			
751.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
752.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
753.	27780	*Hypocenomyce australis*			
754.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
755.	1070	*Hypolaena exsulca*			
756.		*Idiommata blackwalli*			
757.	48489	*Inocybe australiensis*			
758.	912	*Isolepis cyperoides*			
759.	917	*Isolepis marginata (Coarse Club-rush)*			
760.		*Isometroides vescus*			
761.		*Isopeda leishmanni*			
762.		*Isopeda magna*			
763.		*Isopedella cana*			
764.	2221	*Isopogon asper*			
765.	2227	*Isopogon divergens (Spreading Coneflower)*			
766.	2229	*Isopogon dubius (Pincushion Coneflower)*			
767.	2237	*Isopogon sphaerocephalus (Drumstick Isopogon)*			
768.	7396	*Isotoma hypocrateriformis (Woodbridge Poison)*			
769.	7398	*Isotoma pusilla (Small Isotome)*			
770.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
771.	19700	*Isotropis cuneifolia subsp. cuneifolia*			
772.	1532	*Ixia maculata (Yellow Ixia)*	Y		
773.	3997	*Jacksonia alata*			
774.	3998	*Jacksonia angulata*			
775.	4005	*Jacksonia condensata*			
776.	4010	*Jacksonia floribunda (Holly Pea)*			
777.	4018	*Jacksonia lehmannii*			
778.	4025	*Jacksonia restioides*			
779.	4029	*Jacksonia stembergiana (Stinkwood, Kapur)*			
780.	1298	*Johnsonia pubescens (Pipe Lily)*			
781.	19632	*Johnsonia pubescens subsp. pubescens*			
782.	1178	*Juncus bufonius (Toad Rush)*	Y		
783.	1179	*Juncus caespiticius (Grassy Rush)*			
784.	1180	*Juncus capitatus (Capitate Rush)*	Y		
785.	1186	*Juncus microcephalus*	Y		
786.	1188	*Juncus pallidus (Pale Rush)*			
787.	1190	*Juncus planifolius (Broadleaf Rush)*			
788.	1195	*Juncus subsecundus (Finger Rush)*			
789.		*Karaops ellenae*			
790.	4037	*Kennedia coccinea (Coral Vine)*			
791.	4044	*Kennedia prostrata (Scarlet Runner)*			
792.	4045	*Kennedia stirlingii (Bushy Kennedia)*			
793.	12008	*Kickxia elatine subsp. crinita*	Y		
794.	11898	*Kickxia elatine subsp. elatine*	Y		
795.	1221	*Kingia australis (Kingia, Pulonok)*			
796.	5832	*Kunzea ericifolia (Spearwood, Pondil)*			
797.	5841	*Kunzea recurva*			
798.	3667	*Labichea lanceolata (Tall Labichea)*			
799.	11289	*Labichea lanceolata subsp. lanceolata*			
800.	3669	*Labichea punctata (Lance-leaved Cassia)*			
801.	20019	*Lachnagrostis filiformis*			
802.	18585	*Lagenophora huegelii*			

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	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
803.	2249	*Lambertia multiflora (Many-flowered Honeysuckle)*			
804.	14083	*Lambertia multiflora var. darlingensis*			
805.		*Lampona cylindrata*			
806.		*Lampona yanchep*			
807.		*Lamponella ainslie*			
808.	45082	*Lasiopetalum glutinosum subsp. latifolium*			
809.		*Latrodectus hasseltii*			
810.	13284	*Lawrencella rosea*			
811.	1303	*Laxmannia grandiflora*			
812.	11815	*Laxmannia grandiflora subsp. grandiflora*			
813.	1307	*Laxmannia ramosa (Branching Lily)*			
814.	11911	*Laxmannia ramosa subsp. ramosa*			
815.	1308	*Laxmannia sessiliflora (Nodding Lily)*			
816.	11464	*Laxmannia sessiliflora subsp. australis*			
817.		*Laxmannia sp.*			
818.	1309	*Laxmannia squarrosa*			
819.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
820.	7572	*Lechenaultia expansa*			
821.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
822.	27825	*Lecidea ochroleuca*			
823.	19989	*Lepidium didymum*	Y		
824.	1075	*Lepidobolus preissianus*			
825.	18074	*Lepidobolus preissianus subsp. preissianus*			
826.	925	*Lepidosperma angustatum*			
827.	42741	*Lepidosperma apricola*			
828.	41620	*Lepidosperma asperatum*			
829.	930	*Lepidosperma costale*			
830.	932	*Lepidosperma effusum (Spreading Sword-sedge)*			
831.	936	*Lepidosperma leptostachyum*			
832.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
833.	939	*Lepidosperma pruinosum*			
834.	940	*Lepidosperma pubisquameum*			
835.	944	*Lepidosperma scabrum*			
836.		*Lepidosperma sp.*			
837.	29141	*Lepidosperma sp. Gosnells (A. Markey 1145)*			
838.	945	*Lepidosperma squamatum*			
839.	947	*Lepidosperma tenue*			
840.	948	*Lepidosperma tetraquetrum*			
841.	949	*Lepidosperma tuberculatum*			
842.	1653	*Leporella fimbriata (Hare Orchid)*			
843.	1078	*Leptocarpus coangustatus*			
844.	46375	*Leptocarpus decipiens*			
845.	46380	*Leptocarpus kraussii*			
846.		*Leptoceridae sp.*			
847.	2342	*Leptomeria cunninghamii*			
848.		*Leptophlebiidae sp.*			
849.	5847	*Leptospermum erubescens (Roadside Teatree)*			
850.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
851.	1088	*Lepyrodia macra (Large Scale Rush)*			
852.	25131	*Lerista distinguenda*			
853.	25133	*Lerista elegans*			
854.	25148	*Lerista lineopunctulata*			
855.	6367	*Leucopogon capitellatus*			
856.	6374	*Leucopogon conostephioides*			
857.	6397	*Leucopogon glaucifolius*			
858.	6400	*Leucopogon gracillimus*			
859.	6416	*Leucopogon nutans (Drooping Leucopogon)*			
860.	6434	*Leucopogon polymorphus*			
861.	6436	*Leucopogon propinquus*			
862.	6439	*Leucopogon pulchellus (Beard-heath)*			
863.	28311	*Leucopogon sp. Great Southern (R.S. Cowan A 586)*			
864.	6444	*Leucopogon sprengelioides*			
865.	40803	*Leucopogon squarrosus subsp. squarrosus*			
866.	6447	*Leucopogon strictus*			
867.	6451	*Leucopogon tenuis*			
868.	6454	*Leucopogon verticillatus (Tassel Flower)*			
869.	7676	*Levenhookia pusilla (Midget Stylewort)*			
870.	7677	*Levenhookia stipitata (Common Stylewort)*			
871.	25005	*Lialis burtonis*			
872.		*Libellulidae sp.*			

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	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
873.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
874.	25661	*Lichmera indistincta (Brown Honeyeater)*			
875.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
876.	7075	*Linaria marocana*	Y		
877.	4362	*Linum marginale (Wild Flax)*			
878.	4363	*Linum trigynum (French Flax)*	Y		
879.	36160	*Liparophyllum capitatum*			
880.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
881.	25388	*Litoria moorei (Motorbike Frog)*			
882.	9289	*Lobelia anceps (Angled Lobelia)*			
883.	7402	*Lobelia gibbosa (Tall Lobelia)*			
884.	7403	*Lobelia heterophylla (Wing-seeded Lobelia)*			
885.	7406	*Lobelia rhombifolia (Tufted Lobelia)*			
886.	7407	*Lobelia rhytidosperma (Wrinkled-seeded Lobelia)*			
887.	7408	*Lobelia tenuior (Slender Lobelia)*			
888.	9356	*Logfia gallica*			
889.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
890.	1222	*Lomandra brittanii*			
891.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
892.	1228	*Lomandra hermaphrodita*			
893.	1229	*Lomandra integra*			
894.	14542	*Lomandra micrantha subsp. micrantha*			
895.	1234	*Lomandra nigricans*			
896.	1236	*Lomandra odora (Tiered Matrush)*			
897.	1239	*Lomandra preissii*			
898.	1240	*Lomandra purpurea (Purple Mat Rush)*			
899.	1243	*Lomandra sericea (Silky Mat Rush)*			
900.	1244	*Lomandra sonderi*			
901.		*Lomandra sp.*			
902.	1245	*Lomandra spartea*			
903.	1246	*Lomandra suaveolens*			
904.		*Lophochroa leadbeateri*			
905.		*Lophoictinia isura*			
906.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
907.	8564	*Lotus subbiflorus*	Y		
908.	1092	*Loxocarya cinerea*			
909.	4065	*Lupinus angustifolius (Narrowleaf Lupin)*	Y		
910.	4066	*Lupinus cosentinii*	Y		
911.		*Lycosa ariadnae*			
912.		*Lycosa godeffroyi*			
913.	1097	*Lyginia barbata*			
914.	18049	*Lyginia imberbis*			
915.		*Lymnaeidae sp.*			
916.	1656	*Lyperanthus serratus (Rattle Beak Orchid)*			
917.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
918.	6456	*Lysinema ciliatum (Curry Flower)*			
919.	34736	*Lysinema pentapetalum*			
920.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
921.	2839	*Macarthuria australis*			
922.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
923.	18119	*Macrozamia fraseri*			
924.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
925.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
926.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
927.	25654	*Malurus splendens (Splendid Fairy-wren)*			
928.	4961	*Malva parviflora (Marshmallow)*	Y		
929.	24583	*Manorina flavigula (Yellow-throated Miner)*			
930.		*Maratus pavonis*			
931.	19421	*Marianthus bicolor (Painted Marianthus)*			
932.	17637	*Marianthus candidus (White Marianthus)*			
933.	17636	*Marianthus coeruleopunctatus (Blue-spotted Marianthus)*			
934.	17635	*Marianthus drummondianus*			
935.		*Megapodagrionidae sp.*			
936.	5876	*Melaleuca aspalathoides*			
937.	5921	*Melaleuca incana (Grey Honeymyrtle)*			
938.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
939.	20297	*Melaleuca osullivanii*			
940.	18394	*Melaleuca parviceps*			
941.	5952	*Melaleuca preissiana (Moonah)*			
942.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			

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943.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
944.	5961	*Melaleuca scabra (Rough Honeymyrtle, Wurru Bush)*			
945.	5964	*Melaleuca seriata*			
946.	5983	*Melaleuca trichophylla*			
947.	4085	*Melilotus indicus*	Y		
948.	14985	*Melinis repens*	Y		
949.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
950.	25184	*Menetia greyii*			
951.	24598	*Merops ornatus (Rainbow Bee-eater)*			
952.	953	*Mesomelaena graciliceps*			
953.	955	*Mesomelaena pseudostygia*			
954.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
955.		*Microcarbo melanoleucos*			
956.	6897	*Microcorys longifolia*			
957.	25693	*Microeca fascinans (Jacky Winter)*			
958.	485	*Microlaena stipoides (Weeping Grass)*			
959.	1657	*Microtis alba (White Mignonette Orchid)*			
960.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
961.	15419	*Microtis media subsp. media*			
962.	8106	*Millotia tenuifolia (Soft Millotia)*			
963.	14344	*Millotia tenuifolia var. tenuifolia (Soft Millotia)*			
964.	4097	*Mirbelia ramulosa*			
965.	4100	*Mirbelia spinosa*			
966.	7085	*Misopates orontium (Lesser Snapdragon)*	Y		
967.		*Missulena granulosa*			
968.		*Missulena hoggi*			
969.		*Missulena occatoria*			
970.		*Mituliodon tarantulinus*			
971.	7378	*Momordica balsamina (Balsam Apple)*	Y		
972.	29418	*Monoculus monstrosus*	Y		
973.	7410	*Monopsis debilis*	Y		
974.	37440	*Monopsis debilis var. depressa*	Y		
975.	4662	*Monotaxis grandiflora (Diamond of the Desert)*			
976.	19585	*Monotaxis grandiflora var. grandiflora*			
977.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
978.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
979.	25192	*Morethia obscura*			
980.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
981.		*Myandra bicincta*			
982.	25610	*Myiagra inquieta (Restless Flycatcher)*			
983.	14187	*Myriocephalus occidentalis*			
984.		*Nannoperca vittata*			
985.	1495	*Narcissus tazetta (Jonquil)*	Y		
986.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
987.	25686	*Neochmia temporalis (Red-browed Finch)*	Y		
988.	24738	*Neophema elegans (Elegant Parrot)*			
989.		*Neophema pulchella*			
990.		*Nephila edulis*			
991.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
992.		*Nicodamus mainae*			
993.	6978	*Nicotiana rotundifolia (Round-leaved Tobacco)*			
994.	25747	*Ninox connivens (Barking Owl)*			
995.		*Notiasemus glauerti*			
996.		*Notsodipus muckera*			
997.		*Novakiella trituberculosa*			
998.		*Nunciella aspera*			
999.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
1000.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
1001.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
1002.	24742	*Nymphicus hollandicus (Cockatiel)*			
1003.		*Occiperipatoides gilesii*			
1004.		*Ocrisiona leucocomis*			
1005.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
1006.		*Oecobius navus*			
1007.	6139	*Oenothera glazioviana (Evening Primrose)*	Y		
1008.	20052	*Oenothera jamesii*	Y		
1009.	6140	*Oenothera mollissima*	Y		
1010.	11937	*Olea europaea subsp. europaea*	Y		
1011.	8133	*Olearia elaeophila*			
1012.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			

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	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
1013.		*Oligochaeta sp.*			
1014.		*Ommatoiulus moreleti*			
1015.		*Ommatoiulus moreletii*			
1016.		*Oniscidae sp.*			
1017.	18254	*Opercularia apiciflora*			
1018.	7346	*Opercularia echinocephala (Bristly Headed Stink Weed)*			
1019.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
1020.	18255	*Opercularia vaginata (Dog Weed)*			
1021.	46255	*Orianthera campanulata*			
1022.	36177	*Ornduffia albiflora*			
1023.	4113	*Ornithopus compressus (Yellow Serradella)*	Y		
1024.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
1025.		*Orphnaeus brevilabiatus*			
1026.		*Orthocladiinae sp.*			
1027.	11749	*Orthrosanthus laxus var. laxus (Morning Iris)*			
1028.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
1029.		*Ostearius melanopygius*			
1030.	168	*Ottelia ovalifolia (Swamp Lily)*			
1031.	18331	*Oxalis debilis var. corymbosa (Pink Shamrock)*	Y		
1032.	30375	*Oxalis exilis*			
1033.	4352	*Oxalis glabra*	Y		
1034.	4355	*Oxalis perennans*			
1035.	4358	*Oxalis purpurea (Largeflower Wood Sorrel)*	Y		
1036.		*Oxyopes gracilipes*			
1037.		*Oxyopes punctatus*			
1038.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
1039.	7117	*Pandorea pandorana*			
1040.	41961	*Panicum hillmanii*	Y		
1041.	2966	*Papaver somniferum (Opium Poppy)*	Y		
1042.		*Paralampona marangaroo*			
1043.		*Paramelitidae sp.*			
1044.	27905	*Paraporpidia glauca*			
1045.	17114	*Paraserianthes lophantha subsp. lophantha*			
1046.		*Parastacidae sp.*			
1047.	25253	*Parasuta gouldii*			
1048.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
1049.	25682	*Pardalotus striatus (Striated Pardalote)*			
1050.	24630	*Pardalotus striatus subsp. westraliensis (Striated Pardalote)*			
1051.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
1052.	1762	*Parietaria debilis (Pellitory)*			
1053.	3673	*Parkinsonia aculeata (Parkinsonia)*	Y		
1054.	527	*Paspalum dilatatum*	Y		
1055.	532	*Paspalum urvillei (Vasey Grass)*	Y		
1056.	1542	*Patersonia babianoides*			
1057.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
1058.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
1059.	30472	*Patersonia occidentalis var. occidentalis*			
1060.	1551	*Patersonia pygmaea (Pygmy Patersonia)*			
1061.	14433	*Patersonia rudis subsp. rudis*			
1062.	1553	*Patersonia umbrosa (Yellow Flags)*			
1063.	43765	*Pauridia glabella var. glabella*			
1064.	43760	*Pauridia occidentalis*			
1065.	43762	*Pauridia occidentalis var. quadriloba*			
1066.	10828	*Pavonia hastata*	Y		
1067.		*Pediana occidentalis*			
1068.	4346	*Pelargonium littorale*			
1069.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
1070.	40422	*Pentameris pallida*	Y		
1071.	6245	*Pentapeltis peltigera*			
1072.		*Pentasteron securifer*			
1073.	16478	*Pericalymma ellipticum var. floridum*			
1074.	2255	*Persoonia angustiflora*			
1075.	2262	*Persoonia elliptica (Spreading Snottygobble)*			
1076.	2273	*Persoonia saccata (Snottygobble)*			
1077.	48060	*Petrochelidon ariel (Fairy Martin)*			
1078.	48061	*Petrochelidon nigricans (Tree Martin)*			
1079.	48066	*Petroica boodang (Scarlet Robin)*			
1080.	24659	*Petroica goodenovii (Red-capped Robin)*			
1081.	2284	*Petrophile biloba (Granite Petrophile)*			
1082.	2299	*Petrophile linearis (Pixie Mops)*			

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1083.	2308	*Petrophile seminuda*			
1084.	2312	*Petrophile striata*			
1085.	19825	*Petrorhagia dubia*	Y		
1086.		*Peziza sp.*			
1087.	25697	*Phalacrocorax carbo (Great Cormorant)*			
1088.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
1089.	24409	*Phaps chalcoptera (Common Bronzewing)*			
1090.	25587	*Phaps elegans (Brush Bronzewing)*			
1091.	20460	*Pheladenia deformis*			
1092.	18529	*Philotheca spicata (Pepper and Salt)*			
1093.	1172	*Philydrella drummondii*			
1094.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
1095.	14306	*Philydrella pygmaea subsp. pygmaea*			
1096.	1478	*Phlebocarya ciliata*			
1097.	1479	*Phlebocarya filifolia*			
1098.		*Pholcus phalangioides*			
1099.		*Phryganoporus candidus*			
1100.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
1101.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
1102.	4675	*Phyllanthus calycinus (False Boronia)*			
1103.	17794	*Phyllanthus tenellus*	Y		
1104.	4	*Phylloglossum drummondii (Pigmy Clubmoss)*			
1105.		*Physidae sp.*			
1106.		*Phytophthora cinnamomi*			
1107.	2408	*Pilostyles hamiltonii*			
1108.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
1109.	11667	*Pimelea brevistyla subsp. brevistyla*			
1110.	11928	*Pimelea ciliata subsp. ciliata*			
1111.	11404	*Pimelea imbricata var. major*			
1112.	11402	*Pimelea imbricata var. piligera*			
1113.	5259	*Pimelea preissii*			
1114.	5264	*Pimelea spectabilis (Bunjong)*			
1115.	12041	*Pimelea suaveolens subsp. suaveolens*			
1116.	5269	*Pimelea sylvestris*			
1117.		*Pinkfloydia harveii*			
1118.	8165	*Pithocarpa pulchella (Beautiful Pithocarpa)*			
1119.	18352	*Pithocarpa pulchella var. melanostigma*			
1120.		*Planorbidae sp.*			
1121.	7301	*Plantago exilis*			
1122.	7303	*Plantago lanceolata (Ribwort Plantain)*	Y		
1123.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
1124.	25720	*Platycercus icterotis (Western Rosella)*			
1125.	6249	*Platysace compressa (Tapeworm Plant)*			
1126.	6253	*Platysace filiformis*			
1127.	6255	*Platysace juncea*			
1128.	25007	*Pletholax gracilis subsp. gracilis (Keeled Legless Lizard)*			
1129.	32413	*Pleuridium ecklonii*			
1130.	65	*Pleurosorus rutifolius (Blanket Fern)*			
1131.	66	*Pleurosorus subglandulosus*			
1132.	573	*Poa drummondiana (Knotted Poa)*			
1133.	578	*Poa porphyroclados*			
1134.	17016	*Podalyria sericea*	Y		
1135.	25703	*Podargus strigoides (Tawny Frogmouth)*			
1136.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
1137.	45237	*Podolepis aristata subsp. aristata*			
1138.	8175	*Podolepis gracilis (Slender Podolepis)*			
1139.	8177	*Podolepis lessonii*			
1140.	8182	*Podotheca angustifolia (Sticky Longheads)*			
1141.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
1142.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
1143.	8395	*Polygala myrtifolia (Myrtleleaf Milkwort)*	Y		
1144.	25722	*Polytelis anthopeplus (Regent Parrot)*			
1145.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
1146.	4688	*Poranthera drummondii*			
1147.	4690	*Poranthera huegelii*			
1148.	4691	*Poranthera microphylla (Small Poranthera)*			
1149.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
1150.	24771	*Porzana tabuensis (Spotless Crake)*			
1151.	48252	*Prasophyllum cuneatum*			
1152.	1669	*Prasophyllum cyphochilum (Pouched Leek Orchid)*			

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1153.	1671	*Prasophyllum elatum (Tall Leek Orchid)*			
1154.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
1155.	1674	*Prasophyllum giganteum (Bronze Leek Orchid)*			
1156.	16688	*Prasophyllum gracile*			
1157.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
1158.	1677	*Prasophyllum macrostachyum (Laughing Leek Orchid)*			
1159.	1679	*Prasophyllum ovale (Little Leek Orchid)*			
1160.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
1161.	10853	*Prasophyllum plumiforme*			
1162.	25261	*Pseudechis australis (Mulga Snake)*			
1163.	27997	*Pseudocyphellaria neglecta*			
1164.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
1165.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
1166.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
1167.	13255	*Pterochaeta paniculata*			
1168.		*Pterostylis aff. nana*			
1169.	1686	*Pterostylis barbata (Bird Orchid)*			
1170.	10875	*Pterostylis concava*			
1171.	1693	*Pterostylis recurva (Jug Orchid)*			
1172.	12217	*Pterostylis sanguinea*			
1173.	18655	*Pterostylis sp. crinkled leaf (G.J. Keighery 13426)*			
1174.	1698	*Pterostylis vittata (Banded Greenhood)*			
1175.	2716	*Ptilotus declinatus (Curved Mulla Mulla)*			
1176.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
1177.	2720	*Ptilotus esquamatus*			
1178.	2727	*Ptilotus gaudichaudii*			
1179.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
1180.	2763	*Ptilotus stirlingii (Stirling's Mulla Mulla)*			
1181.	4172	*Pultenaea ericifolia*			
1182.		*Purpureicephalus spurius*			
1183.	16367	*Pyrorchis nigricans (Red beaks, Elephants ears)*			
1184.	8195	*Quinetia urvillei*			
1185.	2932	*Ranunculus colonorum (Common Buttercup)*			
1186.	2933	*Ranunculus muricatus (Sharp Buttercup)*	Y		
1187.	3061	*Raphanus raphanistrum (Wild Radish)*	Y		
1188.	24245	*Rattus rattus (Black Rat)*	Y		
1189.		*Raveniella cirrata*			
1190.		*Raveniella peckorum*			
1191.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
1192.	6012	*Regelia ciliata*			
1193.	19183	*Retama raetam*	Y		
1194.	4822	*Rhamnus alaternus (Buckthorn)*	Y		
1195.	48096	*Rhipidura albiscapa (Grey Fantail)*			
1196.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
1197.	13300	*Rhodanthe citrina*			
1198.	15035	*Rhodanthe corymbosa*			
1199.	13234	*Rhodanthe manglesii*			
1200.	13312	*Rhodanthe pyrethrum*			
1201.		*Riccia bifurca*			
1202.		*Richardsonianidae sp.*			
1203.	19942	*Ricinocarpos undulatus*			
1204.	17020	*Robinia pseudoacacia*	Y		
1205.	1556	*Romulea rosea (Guildford Grass)*	Y		
1206.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
1207.	14924	*Romulea rosea var. communis*	Y		
1208.	10931	*Rosa chinensis x moschata*	Y		
1209.	44608	*Rosulabryum billarderii*			
1210.	32426	*Rosulabryum campylothecium*			
1211.	32429	*Rosulabryum torquescens*			
1212.	20496	*Rubus laudatus*	Y		
1213.	40425	*Rytidosperma caespitosum*			
1214.	40426	*Rytidosperma occidentale*			
1215.	40430	*Rytidosperma pilosum*			
1216.	40427	*Rytidosperma setaceum*			
1217.	2906	*Sagina apetala (Annual Pearlwort)*	Y		
1218.		*Sandalodes joannae*			
1219.		*Sandalodes superbus*			
1220.	2356	*Santalum acuminatum (Quandong, Warnga)*			
1221.	7602	*Scaevola calliptera*			
1222.	7603	*Scaevola canescens (Grey Scaevola)*			

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	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
1223.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
1224.	7634	*Scaevola phlebopetala (Velvet Fanflower)*			
1225.	7635	*Scaevola pilosa (Hairy Fan-flower)*			
1226.	7636	*Scaevola platyphylla (Broad-leaved Fanflower)*			
1227.	13182	*Scaevola repens var. repens*			
1228.	6263	*Schoenolaena juncea*			
1229.	975	*Schoenus bifidus*			
1230.	978	*Schoenus brevisetis*			
1231.	979	*Schoenus caespititius*			
1232.	984	*Schoenus curvifolius*			
1233.	987	*Schoenus elegans*			
1234.	991	*Schoenus grammatophyllus*			
1235.	1002	*Schoenus nanus (Tiny Bog Rush)*			
1236.	1006	*Schoenus odontocarpus*			
1237.	1011	*Schoenus rigens*			
1238.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
1239.	1016	*Schoenus subbarbatus (Bearded Bog-rush)*			
1240.	1019	*Schoenus subflavus (Yellow Bog-rush)*			
1241.	1026	*Schoenus unispiculatus*			
1242.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
1243.	6034	*Scholtzia laxiflora*			
1244.		*Scirtidae sp.*			
1245.		*Scolopendra laeta*			
1246.	6	*Selaginella gracillima (Tiny Clubmoss)*			
1247.	32433	*Sematophyllum homomallum*			
1248.	32483	*Sematophyllum subhumile var. contiguum*			
1249.	8203	*Senecio diaschides*			
1250.	20663	*Senecio multicaulis subsp. multicaulis*			
1251.	25884	*Senecio pinnatifolius var. latilobus*			
1252.	8220	*Senecio vulgaris (Common Groundsel)*	Y		
1253.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
1254.		*Servaea spinibarbis*			
1255.	4980	*Sida hookeriana*			
1256.	2909	*Silene gallica (French Catchfly)*	Y		
1257.	15972	*Silene gallica var. gallica*	Y		
1258.	11803	*Silene gallica var. quinquevulnera*	Y		
1259.	2911	*Silene vulgaris (Bladder Campion)*	Y		
1260.	8224	*Siloxerus filifolius*			
1261.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
1262.	14583	*Siloxerus multiflorus*			
1263.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
1264.		*Simuliidae sp.*			
1265.	30948	*Smicrornis brevirostris (Weebill)*			
1266.	7020	*Solanum linnaeanum (Apple of Sodom)*	Y		
1267.	7035	*Solanum sisymbriifolium (Viscid Nightshade)*	Y		
1268.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
1269.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
1270.	1558	*Sparaxis bulbifera*	Y		
1271.	2912	*Spergula arvensis (Corn Spurry)*	Y		
1272.	4205	*Sphaerolobium linophyllum*			
1273.	4207	*Sphaerolobium medium*			
1274.	1700	*Spiculaea ciliata (Elbow Orchid)*			
1275.	8710	*Sporobolus africanus (Parramatta Grass)*	Y		
1276.	6930	*Stachys arvensis (Staggerweed)*	Y		
1277.	4733	*Stackhousia monogyna*			
1278.	9070	*Stackhousia pubescens (Downy Stackhousia)*			
1279.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
1280.	16197	*Stenanthemum emarginatum*			
1281.	3076	*Stenopetalum filifolium*			
1282.	19403	*Stenopetalum gracile*			
1283.	636	*Stenotaphrum secundatum (Buffalo Grass)*	Y		
1284.	2316	*Stirlingia latifolia (Blueboy)*			
1285.	2317	*Stirlingia simplex*			
1286.	25597	*Strepera versicolor (Grey Currawong)*			
1287.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
1288.	30951	*Streptopelia chinensis subsp. tigrina (Spotted Turtle-Dove)*	Y		
1289.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
1290.	24943	*Strophurus spinigerus subsp. inornatus*			
1291.	24942	*Strophurus spinigerus subsp. spinigerus*			
1292.	7681	*Stylidium affine (Queen Triggerplant)*			

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1293.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
1294.	17669	*Stylidium amoenum var. caulescens*			
1295.	30278	*Stylidium androsaceum*			
1296.	7692	*Stylidium breviscapum (Boomerang Triggerplant)*			
1297.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
1298.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
1299.	7696	*Stylidium calcaratum (Book Triggerplant)*			
1300.	7698	*Stylidium caricifolium (Milkmaids)*			
1301.	7699	*Stylidium carnosum (Fleshy-leaved Triggerplant)*			
1302.	7702	*Stylidium ciliatum (Golden Triggerplant)*			
1303.	7712	*Stylidium despectum (Dwarf Triggerplant)*			
1304.	7713	*Stylidium dichotomum (Pins-and-needles)*			
1305.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
1306.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
1307.	7719	*Stylidium ecome (Foot Triggerplant)*			
1308.	7721	*Stylidium emarginatum (Biddy-four-legs)*			
1309.	19251	*Stylidium eriopodum*			
1310.	7736	*Stylidium hispidum (White Butterfly Triggerplant)*			
1311.	13083	*Stylidium lateriticola*			
1312.	7752	*Stylidium lineatum (Sunny Triggerplant)*			
1313.	25829	*Stylidium neurophyllum (Coastal Plain Triggerplant)*			
1314.	7773	*Stylidium petiolare (Horn Triggerplant)*			
1315.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
1316.	7781	*Stylidium pubigerum (Yellow Butterfly Triggerplant)*			
1317.	7783	*Stylidium pycnostachyum (Downy Triggerplant)*			
1318.	33106	*Stylidium recurvum*			
1319.	7785	*Stylidium repens (Matted Triggerplant)*			
1320.	7787	*Stylidium rhynchocarpum (Black-beaked Triggerplant)*			
1321.	7790	*Stylidium roseoalatum (Pink-wing Triggerplant)*			
1322.	25806	*Stylidium scariosum*			
1323.	7798	*Stylidium schoenoides (Cow Kicks)*			
1324.	45594	*Stylidium tenue subsp. majusculum (Showy Fountain Triggerplant)*			
1325.	23511	*Stylidium thesioides (Delicate Triggerplant)*			
1326.	40947	*Stylidium xanthellum*			
1327.		*Styloniscidae sp.*			
1328.	1260	*Stypandra glauca (Blind Grass)*			
1329.	6476	*Styphelia tenuiflora (Common Pinheath)*			
1330.		*Supunna funerea*			
1331.		*Supunna picta*			
1332.	2321	*Synaphea acutiloba (Granite Synaphea)*			
1333.	2323	*Synaphea gracillima*			
1334.	2325	*Synaphea pinnata (Helena Synaphea)*			
1335.	29186	*Synaphea sp. Udumung (A.S. George 17058)*			
1336.	15532	*Synaphea spinulosa subsp. spinulosa*			
1337.		*Synothele durokoppin*			
1338.		*Synothele michaeleeni*			
1339.		*Synthemistidae sp.*			
1340.	16839	*Syringa vulgaris*	Y		Y
1341.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1342.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
1343.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
1344.		*Talitridae sp.*			
1345.		*Tamopsis darlingtoniana*			
1346.		*Tamopsis perthensis*			
1347.		*Tanypodinae sp.*			
1348.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
1349.		*Tasmanicosa leuckartii*			
1350.	20135	*Taxandria linearifolia*			
1351.	4251	*Templetonia drummondii*			
1352.		*Tetragnatha demissa*			
1353.	1034	*Tetraria capillaris (Hair Sedge)*			
1354.	1036	*Tetraria octandra*			
1355.	35579	*Tetraria sp. Jarrah Forest (R. Davis 7391)*			
1356.	667	*Tetrarrhena laevis (Forest Ricegrass)*			
1357.	4535	*Tetratheca hirsuta (Black Eyed Susan)*			
1358.	48342	*Tetratheca hirsuta subsp. hirsuta*			
1359.	4537	*Tetratheca nuda*			
1360.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
1361.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
1362.	1703	*Thelymitra canaliculata (Blue Sun Orchid)*			

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1363.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
1364.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
1365.	11053	*Thelymitra macrophylla*			
1366.	20736	*Thelymitra maculata*			
1367.		*Thelymitra sp.*			
1368.	1718	*Thelymitra villosa (Custard Orchid)*			
1369.	673	*Themeda triandra*			
1370.	5080	*Thomasia foliosa*			
1371.	5084	*Thomasia grandiflora (Large Flowered Thomasia)*			
1372.	5087	*Thomasia macrocarpa (Large Fruited Thomasia)*			
1373.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
1374.	19716	*Thunbergia alata*	Y		
1375.	28071	*Thysanothecium scutellatum*			
1376.	1319	*Thysanotus arenarius*			
1377.	1320	*Thysanotus asper (Hairy Fringe Lily)*			
1378.	1328	*Thysanotus dichotomus (Branching Fringe Lily)*			
1379.	1338	*Thysanotus manglesianus (Fringed Lily)*			
1380.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
1381.	1343	*Thysanotus patersonii*			
1382.	1350	*Thysanotus scaber*			
1383.		*Thysanotus sp.*			
1384.	1351	*Thysanotus sparteus*			
1385.	1354	*Thysanotus tenellus*			
1386.	1357	*Thysanotus thyrsoideus*			
1387.	1358	*Thysanotus triandrus*			
1388.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
1389.	25519	*Tiliqua rugosa*			
1390.	25207	*Tiliqua rugosa subsp. rugosa*			
1391.		*Tipulidae sp.*			
1392.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
1393.	8248	*Tolpis barbata (Yellow Hawkweed)*	Y		
1394.		*Trachycosmus sculptilis*			
1395.	19041	*Trachymene coerulea subsp. coerulea*			
1396.	6280	*Trachymene pilosa (Native Parsnip)*			
1397.		*Trachyspina mundaring*			
1398.	44186	*Trapelia lilacea*			
1399.	11112	*Tribolium uniolae*	Y		
1400.	1482	*Tribonanthes brachypetala*			
1401.	1483	*Tribonanthes longipetala*			
1402.	8251	*Trichocline spathulata (Native Gerbera)*			
1403.		*Trichocyclus nullarbor*			
1404.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
1405.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
1406.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
1407.	1362	*Tricoryne humilis*			
1408.	4289	*Trifolium angustifolium (Narrowleaf Clover)*	Y		
1409.	17145	*Trifolium angustifolium var. angustifolium*	Y		
1410.	4291	*Trifolium arvense (Hare's Foot Clover)*	Y		
1411.	4292	*Trifolium campestre (Hop Clover)*	Y		
1412.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
1413.	4295	*Trifolium dubium (Suckling Clover)*	Y		
1414.	17758	*Trifolium hybridum var. hybridum*	Y		
1415.	4300	*Trifolium incarnatum (Crimson Clover)*	Y		Y
1416.	17541	*Trifolium incarnatum var. incarnatum*	Y		
1417.	4302	*Trifolium ligusticum (Ligurian Clover)*	Y		
1418.	4313	*Trifolium subterraneum (Subterranean Clover)*	Y		
1419.	33677	*Triglochin centrocarpa*			
1420.	18587	*Triglochin nana*			
1421.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
1422.	38401	*Tritonia gladiolaris (Lined Tritonia)*	Y		
1423.	4839	*Trymalium angustifolium*			
1424.	11665	*Trymalium ledifolium var. ledifolium*			
1425.	13479	*Trymalium ledifolium var. rosmarinifolium*			
1426.	33418	*Trymalium odoratissimum subsp. odoratissimum*			
1427.	24983	*Underwoodisaurus milii (Barking Gecko)*			
1428.		*Urodacus novaehollandiae*			
1429.		*Urodacus planimanus*			
1430.		*Uromycladium tepperianum*			
1431.	8255	*Ursinia anthemoides (Ursinia)*	Y		
1432.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		

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1433.	7145	*Utricularia menziesii (Redcoats)*			
1434.	7148	*Utricularia multifida*			
1435.	7153	*Utricularia tenella*			
1436.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
1437.	25526	*Varanus tristis (Racehorse Monitor)*			
1438.	7665	*Velleia trinervis*			
1439.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
1440.		*Venator immansueta*			
1441.		*Venatrix pullastra*			
1442.	15431	*Verticordia acerosa var. acerosa*			
1443.	12388	*Verticordia acerosa var. preissii*			
1444.	6076	*Verticordia densiflora (Compacted Featherflower)*			
1445.	12411	*Verticordia densiflora var. cespitosa*			
1446.	15432	*Verticordia densiflora var. densiflora*			
1447.	6088	*Verticordia huegelii (Variegated Featherflower)*			
1448.	12429	*Verticordia huegelii var. decumbens*			
1449.	15433	*Verticordia huegelii var. huegelii*			
1450.	15434	*Verticordia insignis subsp. insignis*			
1451.	6107	*Verticordia pennigera*			
1452.	12449	*Verticordia plumosa var. brachyphylla*			
1453.	15618	*Verticordia plumosa var. plumosa*			
1454.	4322	*Vicia sativa (Common Vetch)*	Y		
1455.	4325	*Viminaria juncea (Swishbush, Koweda)*			
1456.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
1457.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
1458.	12052	*Vulpia myuros forma megalura*	Y		
1459.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
1460.	7386	*Wahlenbergia gracilenta (Annual Bluebell)*			
1461.	7388	*Wahlenbergia multicaulis*			
1462.	7389	*Wahlenbergia preissii*			
1463.	13328	*Waitzia nitida*			
1464.	8281	*Waitzia podolepis*			
1465.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
1466.	13103	*Watsonia borbonica*	Y		
1467.	18375	*Watsonia knysnana*	Y		
1468.	1566	*Watsonia marginata*	Y		
1469.	18108	*Watsonia meriana var. bulbillifera*	Y		
1470.	18118	*Watsonia meriana var. meriana*	Y		
1471.	32455	*Weissia controversa*			
1472.	1394	*Wurmbea dioica (Early Nancy)*			
1473.	12072	*Wurmbea dioica subsp. alba*			
1474.	1401	*Wurmbea pygmaea*			
1475.	8287	*Xanthium spinosum (Bathurst Burr, Common Cocklebur, Spiny Cocklebur, Spiny Clotburr)*	Y		
1476.	28105	*Xanthoparmelia antleriformis*			
1477.	28123	*Xanthoparmelia digitiformis*			
1478.	28128	*Xanthoparmelia elevata*			
1479.	29032	*Xanthoparmelia imitatrix*			
1480.	28156	*Xanthoparmelia nana*			
1481.	28356	*Xanthoparmelia verrucella*			
1482.	1249	*Xanthorrhoea acanthostachya*			
1483.	1253	*Xanthorrhoea gracilis (Graceful Grass Tree, Mimidi)*			
1484.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
1485.	6283	*Xanthosia atkinsoniana*			
1486.	6284	*Xanthosia candida*			
1487.	6285	*Xanthosia ciliata*			
1488.	6289	*Xanthosia huegelii*			
1489.	44861	*Xerochrysum macranthum*			
1490.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
1491.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

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Appendix C: Conservation Codes

Table C.1 – Definition of codes for Commonwealth Listed Threatened Flora and Fauna

Code	Definition
Ex	**Extinct** Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild** Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	**Critically Endangered** Taxa which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered** Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	**Vulnerable** Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** Taxa which at a particular time if, at that time, the species is the focus of a specific conservation programme, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Table C.2 – Definition of codes for Threatened and Priority Flora (DPaW)

Code	Definition
T	**Threatened Flora – (Declared Rare Flora – Extant)** Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection and have been gazetted as such (Schedule 1 under the *Biodiversity Conservation Act 2016*).
X	**Presumed Extinct Flora (Declared Rare Flora - Extinct)** 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 Schedule 2 under the *Biodiversity Conservation Act 2016*).
P1	**Priority One – Poorly Known Species** Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
P2	**Priority Two – Poorly Known Species** Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
P3	**Priority Three – Poorly Known Species** Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities 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 localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
P4	**Priority Four – Rare, Near Threatened and other species in need of monitoring** (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.
P5	**Priority Five - Conservation Dependent species** Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Table C.3 Definition of DBCA Conservation Codes for Protected Fauna

Code	Type	Definition
Threatened Species	CR - Critically Endangered Species	*"Facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the criteria set out in the ministerial guidelines".*
	EN - Endangered Species	*"Facing an very high risk of extinction in the wild in the near future, as determined in accordance with the criteria set out in the ministerial guidelines".*
	VU - Vulnerable Species	*"Facing an high risk of extinction in the wild in the medium-term future, as determined in accordance with the criteria set out in the ministerial guidelines".*
Extinct Species	EX - Extinct Species	*"There is no reasonable doubt that the last member of the species has died"*
	EW - Extinct in the wild species	*"Is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time fram appropriate to its life cycle and form"*
Specially Protected Species	MI - Migratory Species	"Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone: or the species is subject of an international agreement that relates to the protection of migratory species that binds the Commonwealth"
	CD – Species of special conservation interest (conservation dependent fauna)	"Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines"
	OS – Other specially protected species	"Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines"

Table C.4 – Definition of DBCA Conservation Codes for Priority Fauna

Priority	Definition
Priority 1	Taxa with few, poorly known populations on threatened lands
Priority 2	Taxa with few, poorly known populations on conservation lands
Priority 3	Taxa with several, poorly known ppoulations, some on conservation lands
Priority 4	Taxa in need of monitoring
Priority 5	Taxa that are conservation dependent (i.e. their conservation status is dependent on ongoing active management).

Table C.5 – Definition of codes for Threatened Ecological Communities

Code	Definition
PD: Presumed Totally Destroyed	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant
CR: Critically Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. 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.
EN: Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future. 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.
VU: Vulnerable	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. 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 to long-term future.

Table C.6 – Definition of codes for Priority Ecological Communities

Code	Definition
P1: Priority One	Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or Pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
P2: Priority Two	Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3: Priority Three	(i) 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: (ii) Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (iii) Communities made up of large, and/or widespread occurrences that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
P4: Priority Four	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. (a) Rare. Ecological communities known from few occurrences 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 communities are usually represented on conservation lands. (b) Near Threatened. Ecological communities 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) Ecological communities that have been removed from the list of threatened communities during the past five years. P5: Priority Five 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.
P5: Priority Five	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.

Appendix D: Complete Species List

Family	Species	Conservation Code	Weed Status
Amaranthaceae	*Ptilotus drummondii*		
Apiaceae	*Actinotus leucocephalus*		
	Xanthosia candida		
Asparagaceae	*Lomandra* sp. 1		
	Lomandra sp. 2		
	Thysanotus gracilis		
	Thysanotus multiflora		
Asteraceae	*Taraxacum* sp. (Dandelion)		*
Boryaceae	*Borya sphaerocephala*		
Brassicaceae	*Raphanus rapenistrum* (Radish)		*
Campanulaceae	*Isotoma hypocrateriformis*		
Casuarinaceae	*Allocasuarina huegeliana*		
	Allocasuarina humilis		
Celastraceae	*Tripterococcus brunonis*		
Cyperaceae	*Lepidosperma ?costale*		
	Lepidosperma tenue		
	Mesomelaena tetragona		
	Schoenus brevisetis		
Dilleniaceae	*Hibbertia commutata*		
	Hibbertia hypericoides		
	Hibbertia racemosa		
	Hibbertia subvaginata		
Ericaceae	*Leucopogon pulchellus*		
Fabaceae	*Acacia iteaphylla* (Flinders Range Wattle)		*
	Acacia podalyriifolia (Queensland Silver Wattle)		*
	Acacia pulchella var. *pulchella*		
	Cristonia biloba subsp. *biloba*		
	Cytisus proliferus (Tagasaste)		*
	Daviesia horrida		
	Gastrolobium dilatatum		
	Gompholobium marginatum		
	Hovea trisperma		
	Jacksonia alata		
	Medicago sp. (Burclover)		*
Goodeniaceae	*Goodenia aculeata*		
	Goodenia fasciculata		
Haemodoraceae	*Haemodorum simulans*		
Haloragaceae	*Gonocarpus cordiger*		
Hemerocallidaceae	*Agrostocrinum hirsutus*		
	Tricoryne elatior		
Iridaceae	*Freesia* sp. (Freesia hybrid)		*
	Watsonia meriana var. *bulbillifera* (Watsonia)		*
Lauraceae	*Cassytha flava*		

Family	Species	Conservation Code	Weed Status
Linaceae	*Linum trigynum* (Yellow Flax)		*
Myrtaceae	*Babingtonia camphorosmae*		
	Beaufortia purpurea	P3	
	Calothamnus sanguineus		
	Corymbia calophylla		
	Darwinia citriodora		
	Eucalyptus rudis		
	Eucalyptus wandoo		
	Hypocalymma angustifolium		
	Verticordia pennigera		
Oleaceae	*Olea europaea* (Common olive)		*
Orobanchaceae	*Bellardia trixago* (Mediterranean linseed)		*
Phyllanthaceae	*Phyllanthus calycinus*		
Poaceae	*?Cenchrus* sp. (Feathertop grass)		*
	Avena fatua (Common Wild Oats)		*
	Brachypodium distachyon (Purple False Broom)		*
	Briza maxima (Blowfly Grass)		*
	Neurachne alopecuroidea		
	Pennisetum setaceum (Crimson Fountain Grass)		*
	Poaceae sp.		
	Rytidosperma sp.		
Proteaceae	*Banksia armata*		
	Banksia dallanneyi subsp. *dallanneyi*		
	Banksia sessilis		
	Conospermum huegelii		
	Grevillea bipinnatifida		
	Grevillea endlicheriana		
	Hakea cyclocarpa		
	Hakea erinacea		
	Hakea lissocarpha		
	Petrophile striata		
	Stirlingia simplex		
	Synaphea acutiloba		
Restionaceae	*Desmocladus asper*		
Rhamnaceae	*Trymalium ledifolium*		
	Trymalium odoratissimum subsp. *odoratissimum*		
Stylidiaceae	*Stylidium amoenum*		
	Stylidium dichotomum		
Thymelaeaceae	*Pimelea imbricata*		
Xanthorrhoeaceae	*Xanthorrhoea preissii*		
Zamiaceae	*Macrozamia riedlei*		

Appendix E: Vegetation Community Descriptions

Relevés:	C1R1	**Date:**	23/11/2018	**Easting:**	411232
				Northing:	6472287
Species Richness:	64 species	**Area (Ha):**	1.98ha	**% of survey area:**	29.47%

Vegetation Description:

Low open woodland of *Allocasuarina huegeliana, Corymbia calophylla* over closed shrubland of *Calothamnus sanguineus, Xanthorrhoea preissii, Grevillea endlicheriana, Banksia armata, Hakea erinacea, Beaufortia purpurea* (P3), *Trymalium ledifolium* over low closed shrubland of *Borya sphaerocephala, Stylidium dichotomum, Synaphea acutiloba, Stirlingia simplex, Lepidosperma ?costale, Freesia* sp., *Watsonia meriana* var. *bulbillifera*. Granite outcropping, sandy clay over laterite, quartz gravels, shallow.

Type 1 vegetation in Lot 103

Relevés:	C2R1	**Date:**	23/11/2018	**Easting:**	411215
				Northing:	6472076
Species Richness:	51 species	**Area (Ha):**	1.65ha	**% of survey area:**	24.52%

Vegetation Description:

Tall open forest of *Corymbia calophylla, Eucalyptus wandoo* over tall shrubland of *Calothamnus sanguineus, Hakea erinaceae, Xanthorrhoea preissii, Trymalium odoratissimum* subsp. *odoratissimum* over shrubland of *Hakea lissocarpha, Hibbertia hypericoides, Watsonia meriana* var. *bulbillifera, Macrozamia riedlei, Phyllanthus calycinus, Lepidosperma ?costale.* Clay loam, little outcropping

Type 2 vegetation in Lot 351

McDowall Affleck
CONSULTING ENGINEERS | PROJECT MANAGERS
Responsive. Reliable. Results.

SITE AND SOIL EVALUATION

FOR

STRUCTURE PLANNING – LOT 350 AND 351 VIVEASH ROAD, SWAN VIEW

PREPARED FOR
KYAL GATTI AND BRIAN BUTTSWORTH

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0	Draft	Michael Ferritto	Robert Smith	11/6/2020
1	Approval	Michael Ferritto	Robert Smith	12/6/2020

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Table of Contents

1.0 INTRODUCTION

McDowall Affleck Pty Ltd were engaged to conduct a Site and Soil Evaluation (SSE) and report for Structure Planning purposes for Lots 350 and 351 Viveash Road Swan View.

The land is zoned Residential (R2.5 Land west of the ridge line and R5 for land east of the ridge) and requires a structure plan to enable a subdivision to be undertaken.

The investigation and reporting was completed as required by the Health Department of WA and the Shire of Mundaring under the new State Government Sewerage Policy.

We dug holes on site with a Caterpillar Backhoe 432E on Wednesday 3rd June 2020. Michael Ferritto from our office was present at the site digs. Simon O'Hara from Statewest Planning and Martin Shurlock also attended the site and inspected the holes dug. A log of holes is included in the report for the investigation. A site plan is provided to show the approximate location of the holes dug.

2.0 EXECUTIVE SUMMARY

This report is based on the site investigation conducted in June 2020.

This report demonstrates compliance with the Shire of Mundaring's requirements, State Government Sewerage Policy and with AS 1547:2012. This report recommends that on site effluent disposal be adopted using Aerobic Treatment Units (ATU's) for proposed lots 6, 7 and 9. The remaining lots can use conventional or flat bed leach drains suitably sized in accordance with this report and in accordance with AS1547:2012, State Government Sewerage Policy 2019 and the Shire of Mundaring Onsite Effluent Guidelines.

The effluent disposal areas for each lot will be designed in conjunction with the Shire of Mundaring at the time of building development application (DA).

The clayey SANDS and Sandy CLAYS will be classified as strongly adsorbing and are likely to have a PRI greater than 20.

The site investigation indicated that there was no evidence of any groundwater or seepage through the soil profile. The depth to rock was greater than 600. There is adequate clearance to an impermeable layer or groundwater for flat bed leach drains to be used. With the provision of cut off drains and/or bunding to protect the effluent disposal fields from overland flow (or placement on site so that the effluent disposal fields are protected by the house) and provision of subsoil drains to provided added protection of the possibility of subsoil flows in the upper soil profiles particularly at the change of profile from loam to clayey SANDS, that no other special drainage works are required.

In accordance with Supplement to Regulation 29 and Schedule 9 – Wastewater system loading rates, the expected volume of wastewater will be 829 L/day from each existing house (based on 4-5 bedrooms).

As a guide, this will require an effluent disposal area of 55m^2 for a 2.4m flat bed leach drain system using a DLR of 15mm/day. This increases to 166m^2 if a 2.4m wide flat bed is used with a DLR of 5mm/day. The proposed lots vary in size of between 2,000m^2 to 4,418 therefore the provision of suitably sized disposal areas will not be an issue.

Our Site and Soil Evaluation indicates there should not be any issues with onsite disposal of effluent.

3.0 LIMITS OF REPORT

The report is limited in the areas covered to those matters cogent to this particular situation.

4.0 SITE CHARACTERISTICS

The site is generally vegetated with sparse various species of gum trees and low natural native scrub vegetation. An extract from the Flora Study by Terratree indicates:

"Two vegetation communities were identified during the survey. Type 1 vegetation was characterised as a granitic heathland community, with an overstorey of Allocasuarina huegeliana over a heathland of Melaleuca, Fabaceae and Proteaceae species. This was the main vegetation type in Lot 103, with some presence also in Lots 350 and 351. Type 2 vegetation was characterised as having an overstorey of Corymbia calophylla and Eucalyptus wandoo, with an open shrubland understorey consisting of species including Calothamnus sanguineus, Hakea erinacea and Xanthorrhoea preissii. The slopes of Lots 350 and 351 were dominated by Type 2 vegetation. None of the vegetation communities matched any description of Priority or Threatened Ecological Communities."

"Much of the survey area is densely infested with weed species. Most notably, Watsonia meriana var. bulbillifera was found across all vegetation communities. Other significant weed species included Fountain Grass (Pennisetum setaceum) and Common Wild Oats (Avena fatua)."

There are some granite rock outcrops and some cleared tracks on site predominantly for firebreaks.

Lot 350 (#290) Viveash Rd has a 2 storey house on it in the north west corner of the lot with a shed at the rear of the house. Lot 351 (#220) Viveash Road has a single storey house on it with a shed at the rear of the house and is located on the south west corner of the lot. This lot (house) is connected to mains sewer.

4.1 Slope/Grade

Lot 350 is situated on moderately steep sloping land (12%) falling to the west towards Viveash Rd from the ridge line and is steep sloping land (19%) on the portion of land falling to the east from the ridge line towards Pechey Rd. Lot 351 is situated on moderately steep sloping land (9%) falling to the west towards Viveash Rd from the ridge line and is steep sloping land (15%) on the portion of land falling to the east from the ridge line towards Pechey Rd.

4.2 Erosion

There is only a slight area of erosion evident on the land in areas of the firebreaks.

4.3 Inundation

The land is not subject to inundation.

4.4 Rock Outcrops

There are varying granite and diorite rock outcrop areas on the land.

4.5 Run Off

Surface runoff from the west side of the ridge line, makes its way west towards the Shire of Mundaring drainage network located within Viveash Road. This then runs down an open drain within a POS down to Chartwell Park where it connects into a Water Corporation Main Drain.

Surface runoff from the east side of the ridge line, makes its way east towards Pechey Road and overland onto the kerbed road and collected in the Shire of Mundaring drainage network located within Pechey Road. This will then discharge into a tributary of Jane Brook within the John Forrest National Park.

Site drainage will need to be discharged at predevelopment flow rates to alleviate any impact on the existing drainage network.

4.6 Soil Profile

The soil profile was investigated by making test pits with an excavator. This allows good visual identification of the depth of horizons and the soil types.

A desktop review of the Geological Survey Maps of Perth indicates that the sites contain Sandy Silt and Pebbly Silt. The Sandy Silt is yellowish brown, tough, with variable sand content of fine to medium-grained quartz sand, some gravel in places. The Pebbly Silt is strong brown silt with common, fine to occasionally coarse-grained, sub-rounded laterite quartz, heavily weathered granite pebble, some fine to medium-grained quartz sand, of alluvial origin.

A desktop review of the Darling Range Capability Map indicates that the sites consists of Darling Scarp Subsystem described as Low to steep (10-50%), westward-facing slopes, 40-160 m relief. Soils are loamy earths with scattered rock outcrop (gneiss).

The site excavations are generally in line with the desktop investigation.

We attach an extract from the Geological Survey Maps of Perth of the area, as well as the Darling Range Capability Maps (see Appendix 4).

4.7 Horizons

The horizons for the twelve holes dug by the backhoe are shown in Appendix 2. Photos of the holes are shown in Appendix 3.

4.8 Phosphorous Retention Index

PRI tests were not undertaken due to the clayey SANDS and sandy CLAYS being classified as strongly adsorbing and are likely to have a PRI greater than 20.

Some of the proposed building envelopes on the lots fronting Pechey Road (namely Proposed Lots 6, 7 & 9) are closer to the existing creek line than 100m. Proposed Lot 9 lowest point of the building envelope is approximately 43m from the creek line. Proposed Lot 7 lowest point of the building envelope is approximately 54m from the creek line. Proposed Lot 6 lowest point of the building envelope is approximately 68m from the creek line. They are all greater than the 30 m minimum under the previous setback guidelines. The soils however will have good Phosphorous Retention Index capabilities and so a reduced setback could be approved for these lots.

The proposed lots 6, 7 and 9 should use ATU's as the treatment system for effluent to ensure good quality effluent is being discharged to a drip irrigation system within good PRI soils so that the creek line is not affected by the treated effluent.

5. WATER TABLE

A water table was not encountered in any of the holes excavated and a water table was not evident in any of the horizons of the soil profiles exposed.

We conclude that, with the provision of cut off drains and/or bunding to protect the effluent disposal fields from overland flow (or placement on site so that the effluent disposal fields are protected by the house) and provision of subsoil drains to provided added protection of the possibility of subsoil flows in the upper soil profiles particularly at the change of profile from loam to clayey SANDS, that no other special drainage works are required.

6. SOIL CATEGORY AS1547:2012

The site plan is shown at Appendix 1 and records the location of the test pits, the existing lot boundaries.

For proposed Lots 2, 3, 4, 5, 8, 10, 11, 12, and 14 the top 300 – 600 of LOAM can be classified as Soil Category 2 (Loamy Sand to Sandy Loam) in accordance with Table E1 AS/NZS 1547:2012. The next 500 – 1900 can be classified as a Soil Category 4 (Sandy Clay Loam) to Soil Category 5 (Sandy CLAY) in accordance with Table E1 AS/NZS 1547:2012.

For proposed Lots 6, 7, 8 and 9, the top 350 – 800 of LOAM can be classified as Soil Category 2 (Loamy Sand to Sandy Loam) in accordance with Table E1 AS/NZS 1547:2012. The next 600 – 700 can be classified as a Soil Category 5 (Sandy Clay) in accordance with Table E1 AS/NZS 1547:2012.

In order to achieve on site effluent disposal, suitably sized relatively level (possibly tiered) irrigated landscape areas will be required.

6.1 Soil Permeability

Soil permeability tests were not deemed to be necessary.

From Table 5.2: Soil Categories and Recommended Design Irrigation/Loading Rates (DIR/DLR) for Land Applications Systems in AS/NZS 1547:2012, the Design Loading Rate (DLR) for trenches and beds for the Soil Category 2 Sandy LOAM or Loamy SAND is 15mm/day (conservative rate) for leach drains and up to 50mm/day when used in conjunction with ATU's (Secondary treatment). The Design Irrigation Rate (DIR) for the Soil Category 2 Sandy LOAM or Loamy SAND is 5 mm/day.

The Design Loading Rate (DLR) for trenches and beds for the Soil Category 5 Sandy CLAY is 5mm/day for leach drains and up to 12mm/day when used in conjunction with ATU's (Secondary treatment). The Design Irrigation Rate (DIR) for the Soil Category 5 Sandy CLAY is 3 mm/day.

This range of DLR and DIR allow the designer of the effluent disposal system on each lot to be able to cater for varying alternatives, such as using a leach drain only – traditional or flat bed, ATU with leach drain, ATU with drip irrigation.

We recommend using a DLR for a conventional trench Leach Drain to use 5mm/day for design purposes or 12mm/day when used in conjunction with an ATU. If a Flat Bed Leach Drain is used within the upper soil profile, then a DLR of 15mm/day can be used on a flat area with maximum slope of 5%. The beds themselves however need to be flat.

We recommend using a DIR of 5mm/day with the importation of 150mm of good quality topsoil for the irrigation area on the basis that the irrigation area is flat (up to 10% grade).

7. ANTICIPATED WATER USAGE

7.1 Proposed Development

This report is to support a Structure Plan, which will outline suitable land uses, these are residential as per the Shire of Mundaring zoning maps. A development application will need to be lodged for proposed residential dwellings. This will outline the building footprint, number of bedrooms and water appliances, drainage, stormwater, etc to enable the effluent disposal fields to be sized.

7.2 Water Usage

Water usage will not be known until each new dwelling is designed. The effluent system will need to be designed in accordance with AS/NZS 1547:2012 based on the number of bedrooms and utilities proposed for each dwelling.

The current zoning is residential with 4-5 bedrooms, therefore in accordance with Supplement to Regulation 29 and Schedule 9 – Wastewater system loading rates, the expected volume of wastewater will be 829 L/day per dwelling.

As a guide, this will require an effluent disposal area of 55m^2 for a 2.4m flat bed leach drain system using a DLR of 15mm/day. This increases to 166m^2 if a 2.4m wide flat bed is used with a DLR of 5mm/day. The proposed lots vary in size of between 2,000m^2 to 4,418 therefore the provision of suitably sized disposal areas will not be an issue.

The wastewater volume and subsequent effluent disposal area will need to be confirmed at detailed design.

8. CONCLUSIONS

Some of the proposed building envelopes on the lots fronting Pechey Road (namely Proposed Lots 6, 7 & 9) are closer to the existing creek line than 100m. The soils however will have good Phosphorous Retention Index capabilities and so a reduced setback could be approved for these lots.

The proposed lots 6, 7 and 9 should use ATU's as the treatment system for effluent to ensure good quality effluent is being discharged to a drip irrigation system within good PRI soils so that the creek line is not affected by the treated effluent.

The remaining lots can use flat bed leach drains suitably sized in accordance with this report and in accordance with AS1547:2012, State Government Sewerage Policy 2019 and the Shire of Mundaring Onsite Effluent Guidelines.

With the provision of cut off drains and/or bunding to protect the effluent disposal fields from overland flow (or placement on site so that the effluent disposal fields are protected by the house) and provision of subsoil drains to provided added protection of the possibility of subsoil flows in the upper soil profiles particularly at the change of profile from loam to clayey SANDS, that no other special drainage works are required.

There should be no issues with the PRI with the natural site LOAMS and Sandy CLAYS having a PRI greater than 20.

The proposed lots vary in size of between 2,000m^2 to 4,418 therefore the provision of suitably sized disposal areas will not be an issue.

Our Site and Soil Evaluation indicates there should not be any issues with onsite disposal of effluent for proposed subdivision of Lots 350 and 351 Viveash Road Swan View in accordance with the State Government Sewerage Policy 2019 and the Shire of Mundaring Onsite Effluent Guidelines.

9.0 QUALIFICATIONS OF SITE AND SOIL EVALUATOR

This Site Soil Evaluation was completed by Michael Ferritto. My capability Statement is noted below.

If you have any questions, please call me on 9274 6444.

Yours faithfully

Michael Ferritto | Managing Director | McDowall Affleck Pty Ltd | ABN: 23 009 033 345 |
T: +61 8 9274 6444 | F: +61 8 9250 3433 | E: mferritto@mapl.net.au |

8 June 2020

CAPABILITY STATEMENT - MICHAEL FERRITTO

CURRENT POSITIONS

- Managing Director – McDowall Affleck Pty Ltd
- Commercial Manager and Principal Engineer Civil

PROFESSIONAL QUALIFICATIONS

- Bachelor of Engineering with second class honours - Civil Engineering, Curtin University of Technology

PROFESSIONAL MEMBERSHIPS

- Member of Engineers Australia (MIEAust)
- Chartered Professional Engineer (CPEng)
- Member of the College of Civil Engineers
- NPER Registered Civil Engineer (NPER)

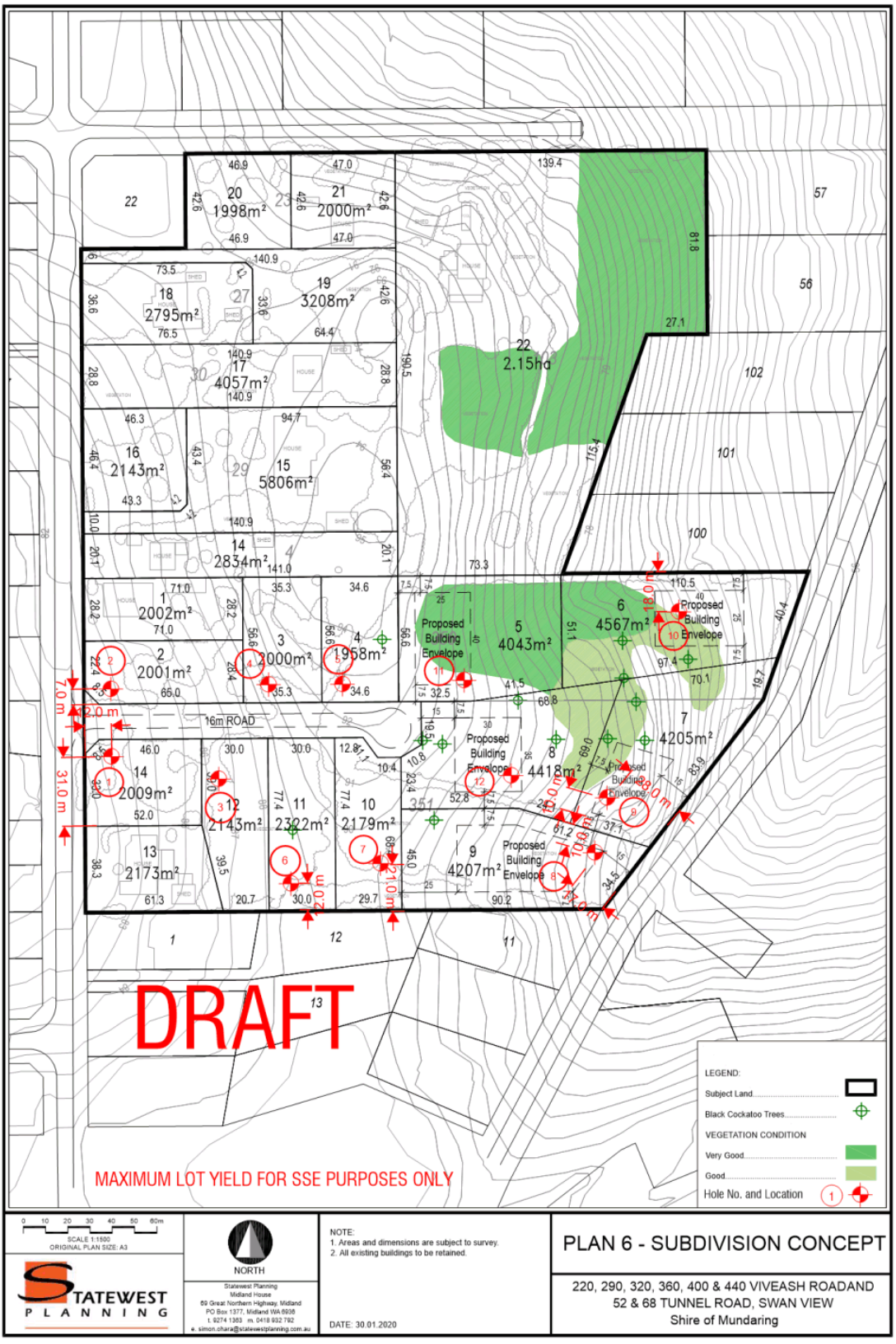
EXPERTISE

Michael has been working as a Civil Engineer since 1992 and has extensive experience in the Perth Hills, Swan Valley, Midland and Foothills of Perth. Due to this experience he is very familiar with the various soils found within the Perth Metropolitan Area. Michael has been doing site soil investigations with the City of Swan, Shire of Kalamunda, Shire of Mundaring and has built a good reputation with the various councils.

Michael specializes in the following relating to Site and Soil Evaluations,

- Site investigations throughout the hills of Perth and subsequent residential slabs and footing design for these sites to AS 2870.
- Inspection of cracked houses, investigation of causes and then remediation of the residences.
- Land capability investigations and reports (AS1547).

APPENDIX 1 - SITE PLAN


DRAFT
MAXIMUM LOT YIELD FOR SSE PURPOSES ONLY
Proposed Building Envelope
16m ROAD
LEGEND:
Subject Land
Black Cockatoo Trees
VEGETATION CONDITION
Very Good
Good
Hole No. and Location
NORTH
NOTE:
1. Areas and dimensions are subject to survey.
2. All existing buildings to be retained.
DATE: 30.01.2020
PLAN 6 - SUBDIVISION CONCEPT
220, 290, 320, 360, 400 & 440 VIVEASH ROADAND
52 & 68 TUNNEL ROAD, SWAN VIEW
Shire of Mundaring
STATEWEST PLANNING

APPENDIX 2 – LOG OF HOLES

HOLE No.	DEPTH	DESCRIPTION	NOTES
1.	0 – 150 150 – 600 600 – 1300 1300 – 1700	Dark Loamy Brown Topsoil Brown LOAM Yellow granitic Sandy CLAY Red plastic CLAY	Proposed Lot 14 Sampled
2.	0 – 150 150 – 550 550 – 1900	Dark Loamy Brown Topsoil Brown LOAM Yellow granitic Sandy CLAY tending to white mottled Red decomposed granite	Proposed Lot 2 Sampled
3.	0 – 100 100 – 500 500 – 1500	Topsoil Brown LOAM Beige granitic Clayey SAND tending to decomposed granite	Proposed Lot 12 Hard digging
4.	0 – 500 500 – 1000	Red/Brown LOAM White decomposed granite	Proposed Lot 3 Hard digging
5.	0 – 600 600 – 900 900	Red/Brown LOAM White decomposed granite tending to Granite ROCK Refusal	Proposed Lot 4 2 granite rock floaters removed
6.	0 – 100 100 – 500 500 – 1700	Topsoil Beige sandy LOAM Yellow/beige granitic Clayey SAND tending to decomposed granite ROCK	Proposed Lot 11 Sampled
7.	0 – 100 100 – 500 500 – 1100	Topsoil Beige Sandy LOAM Yellow/beige granitic Clayey SAND tending to decomposed granite ROCK	Proposed Lot 10
8.	0 – 100 100 – 800 800 – 1500 1500 – 2000	Topsoil Brown LOAM Yellow granitic Clayey SAND Yellow granitic Clayey SAND tending to decomposed granite ROCK	Proposed Lot 9 Sampled

9.	0 – 100 100 – 400 400 – 1000 1000 – 1200	Topsoil Brown/beige LOAM Yellow mottled red granitic sandy CLAY White decomposed granite tending to ROCK	Proposed Lot 7 Hard Digging
10.	0 – 100 100 – 350 350 – 1000 1000 – 1300	Topsoil Red/Brown LOAM Yellow mottled red granitic clayey SAND White decomposed granite tending to ROCK	Proposed Lot 6
11.	0 – 100 100 – 300 300 – 800 800 – 1050	Topsoil Brown LOAM Yellow granitic clayey SAND White decomposed granite tending to ROCK	Proposed Lot 5
12.	0 – 400 400 – 1200 1200	Brown LOAM Yellow granitic Clayey SAND tending to white decomposed granite ROCK Hard digging	Proposed Lot 8 Sampled

APPENDIX 3 – PHOTOS

Hole 1 Proposed Lot 14

Hole 2 Proposed Lot 2

Hole 3 Proposed Lot 12

Hole 4 Proposed Lot 3

Hole 5 Proposed Lot 4

Hole 6 Proposed Lot 11

Hole 7 Proposed Lot 10

Hole 8 Proposed Lot 9

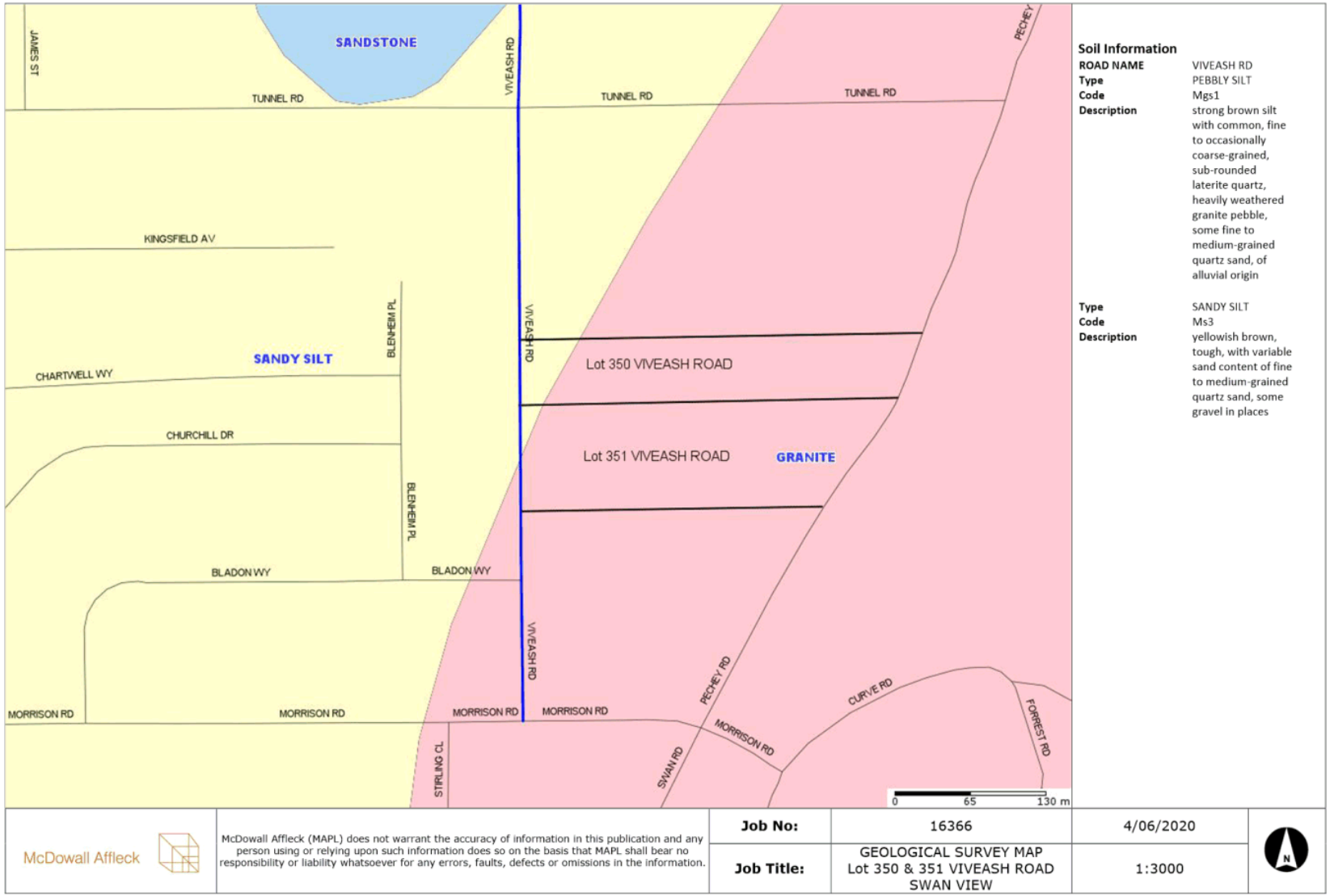
Hole 9 Proposed Lot 7

Hole 10 Proposed Lot 6

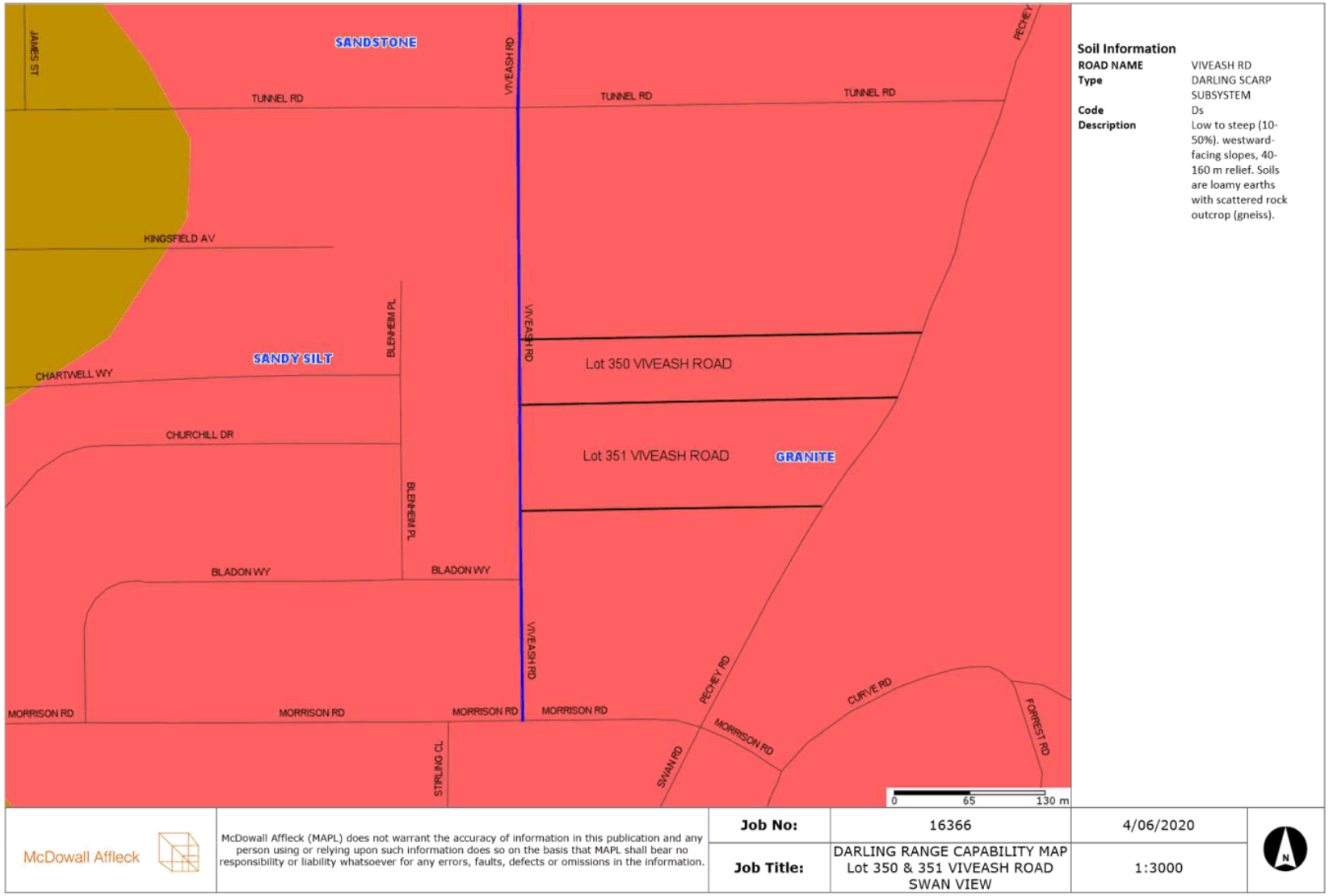
Hole 11 Proposed Lot 5

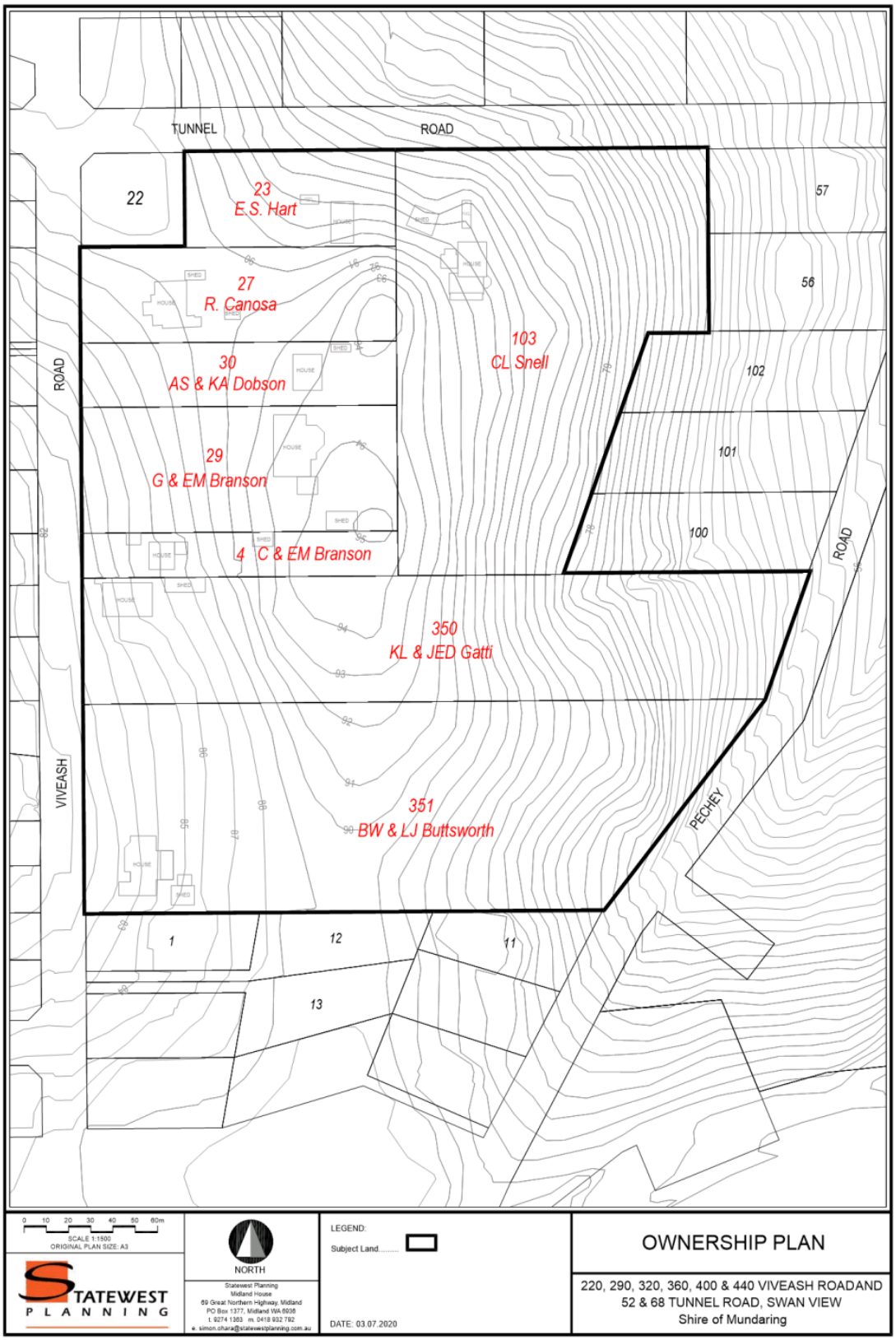
Hole 12 Proposed Lot 8

APPENDIX 4 – GEOLOGICAL SURVEY MAP OF PERTH


SANDSTONE
SANDY SILT
GRANITE
Lot 350 VIVEASH ROAD
Lot 351 VIVEASH ROAD
JAMES ST
TUNNEL RD
VIVEASH RD
PECHEY
KINGSFIELD AV
BLENHEIM PL
CHARTWELL WY
CHURCHILL DR
BLADON WY
MORRISON RD
PECHEY RD
CURVE RD
FORREST RD
SWAN RD
STIRLING CL
0
65
130 m
Soil Information
ROAD NAME VIVEASH RD
Type PEBBLY SILT
Code Mgs1
Description strong brown silt with common, fine to occasionally coarse-grained, sub-rounded laterite quartz, heavily weathered granite pebble, some fine to medium-grained quartz sand, of alluvial origin
Type SANDY SILT
Code Ms3
Description yellowish brown, tough, with variable sand content of fine to medium-grained quartz sand, some gravel in places
McDowall Affleck
McDowall Affleck (MAPL) does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that MAPL shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
Job No: 16366 4/06/2020
Job Title: GEOLOGICAL SURVEY MAP Lot 350 & 351 VIVEASH ROAD SWAN VIEW 1:3000
N

APPENDIX 4 – DARLING RANGE CAPABILITY MAP


SANDSTONE
SANDY SILT
GRANITE
JAMES ST
TUNNEL RD
TUNNEL RD
TUNNEL RD
VIVEASH RD
VIVEASH RD
VIVEASH RD
PECHEY
KINGSFIELD AV
CHARTWELL WY
CHURCHILL DR
BLENHEIM PL
BLENHEIM PL
Lot 350 VIVEASH ROAD
Lot 351 VIVEASH ROAD
BLADON WY
BLADON WY
MORRISON RD
MORRISON RD
MORRISON RD
MORRISON RD
MORRISON RD
PECHEY RD
CURVE RD
FORREST RD
SWAN RD
STIRLING CL
0
65
130 m
Soil Information
ROAD NAME VIVEASH RD
Type DARLING SCARP SUBSYSTEM
Code Ds
Description Low to steep (10-50%). westward-facing slopes, 40-160 m relief. Soils are loamy earths with scattered rock outcrop (gneiss).
McDowall Affleck
McDowall Affleck (MAPL) does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that MAPL shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
Job No:
16366
4/06/2020
Job Title:
DARLING RANGE CAPABILITY MAP
Lot 350 & 351 VIVEASH ROAD
SWAN VIEW
1:3000
N


TUNNEL
ROAD
22
23
E.S. Hart
27
R. Canosa
30
AS & KA Dobson
29
G & EM Branson
4
C & EM Branson
103
CL Snell
57
56
102
101
100
ROAD
350
KL & JED Gatti
351
BW & LJ Buttsworth
VIVEASH
ROAD
PECHEY
1
12
11
13
SCALE 1:1500
ORIGINAL PLAN SIZE: A3
NORTH
LEGEND:
Subject Land.....
DATE: 03.07.2020
STATEWEST PLANNING
OWNERSHIP PLAN
220, 290, 320, 360, 400 & 440 VIVEASH ROADAND
52 & 68 TUNNEL ROAD, SWAN VIEW
Shire of Mundaring

10.3 Gravel Extractive Industry - 3650 (Lot 556) Toodyay Road, Bailup

File Code	PS.DEV 08.01
Author	Marielle Bradfield, Planning Officer
Senior Employee	Mark Luzi, Director Statutory Services
Disclosure of Any Interest	Nil
Attachments	1. Extractive Industry Development Plans ⇩ 2. Extractive Industry Application Report ⇩ 3. Traffic Impact Assessment (TIA) Revision H ⇩

Landowner	Trico Resources Pty Ltd
Applicant	Town and Country Planning
Zoning	General Agriculture
Area	3,754,641sqm (375 hectares)
Use Class	'A'

SUMMARY

Planning approval is sought to accelerate the gravel extraction and processing at an approved 'Extractive Industry' at 3650 (lot) Toodyay Road, Bailup, from 47,000 tonnes/year to 950,000 tonnes per annum (maximum). The total extraction amount of 1,200,000 cubic metres of gravel remains unchanged.

The proponent requires greater flexibility in the amount of annual extraction to enable the operator to secure larger contracts and to respond to market demand.

Concerns have been raised regarding traffic, noise, dust and environmental impacts. Importantly, the operation must comply with various State approvals including a series of management plans and ongoing monitoring obligations. A significant intersection upgrade is required to improve access and egress to Toodyay Road.

Excavation must occur incrementally in stages. At the end of each stage, the area excavated must be remediated and revegetated. Approving an increase in the yield per year would accelerate the rehabilitation of the site and is likely to reduce the length of time of the overall extraction operation.

Given the extractive industry is an approved use, and the operation is heavily regulated by State agencies and management plans are in place, it is recommended that Council approves the increase in the rate of extraction, subject to conditions.

BACKGROUND

Approval History of Site

Extraction up to 47,000tpa

- 26 October 2010 - Council issued conditional planning approval for an extractive industry for annual gravel extraction up to 47,000 tonnes;

- 31 October 2013 - Western Australian Planning Commission (WAPC) issued conditional planning approval for an extractive industry for annual gravel extraction up to 47,000 tonnes. This approval is valid for a period of 10 years, expiring 31 October 2023; and

- February 2014 - An Extractive Industry Licence (EIL) was issued by the Shire in 2014. The EIL was last renewed in June 2020 and is still valid.

Extraction up to 950,000tpa

In 2016 the proprietor (Trico Resources Pty Ltd) and contractor (Swan Gravel Pty Ltd) applied to the Department of Water and Environmental Regulation (DWER) for a works approval and licence for the screening, crushing and processing of gravel up to 950,000 tonnes per annum.

DWER granted a works approval in August 2016 and licence in April 2017 (expiry Oct 2023) under Part V Division 3 of the *EP Act 1986*, authorising crushing and screening of gravel up to 950,000 tonnes per year, on a 'prescribed premises' as defined under Schedule 1, Category 12 of the *Environmental Protection Regulations 1987*.

The works approval and licence regulate the emissions and/or pollution resulting from the crushing and screening of the raw material on site.

The works approval and licence also extend to other operational activities on site (i.e. the control of noise and dust emissions, and stormwater run-off associated with set-up operations, and ongoing extraction, stockpiling and haulage of material). It also includes controls for the progressive rehabilitation and revegetation of each stage, and the construction of a noise bund adjacent to Gravel Extraction Area 2.

As part of this works approval process, DWER conducted a clearing assessment for the clearing of 100 native trees on site. DWER evaluated the biodiversity and conservation values of native vegetation on site, surface and groundwater impacts, and potential land degradation as a result of the clearing. A clearing permit was issued with no conditions imposed.

DWER did not consider referral to the Environmental Protection Agency (EPA) necessary, as the implications of the proposal would not create significant environmental impacts, nor has the site been identified as an 'environmentally sensitive area'.

In December 2017 the proponent applied to the WAPC for development approval under the Metropolitan Regional Scheme (MRS), and applied concurrently to the Shire for local government approval under LPS 4.

The WAPC has carried out a detailed assessment of the impacts of the proposal at state planning level in accordance with the MRS.

Conditional planning approval was recently granted by the WAPC on 8 September 2020 for the extractive industry to increase gravel extraction from 47,000tpa to 950,000tpa.

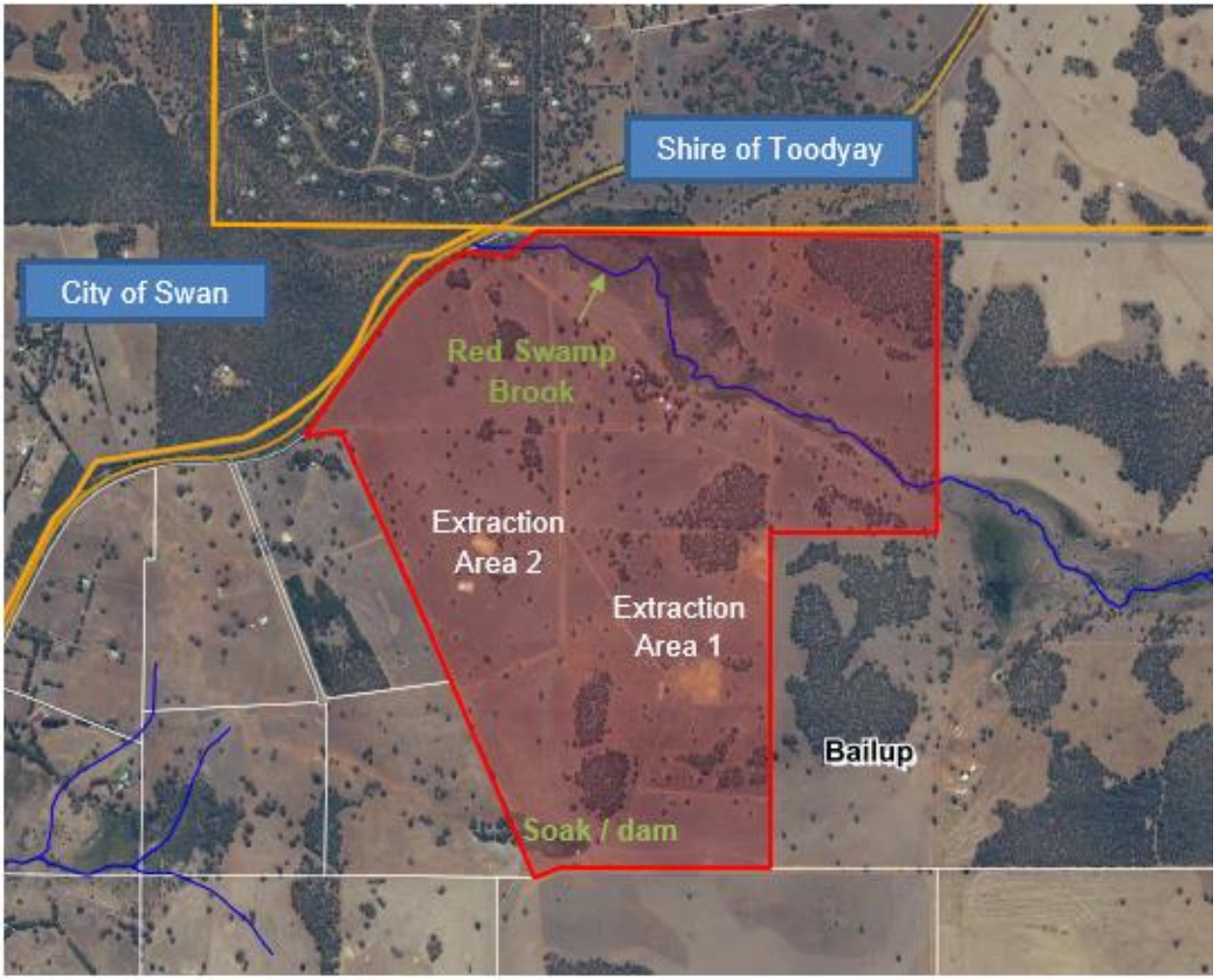
Description of Subject Site:

The subject site is approximately 375 hectares in area. The majority of the site has been historically cleared and consists of grassland with free standing trees. There are some clustered areas of natural vegetation, predominantly located within the north eastern corner of the site. There is an uninhabited residence located in the north central part of the site.

Based on the soil type and landform, the site is considered to have a low capability of supporting intensive agricultural uses, and therefore is not identified as high quality or 'priority' agricultural land.

The site is surrounded by General Agriculture zoned properties to the east, west and south. Vehicular access to the site is off Toodyay Road, which is a primary regional road, and adjoins the property along its northern boundary. Land to the north of Toodyay Road falls within the municipal boundaries of the Shire of Toodyay and contains rural residential land uses.

Figure 1: 3650 (Lot 556) Toodyay Road, Bailup (yellow lines indicate adjoining Council boundaries)



The Red Swamp Brook traverses the northern section of the site and flows in a north westerly direction. There is an existing soak/dam within the south western corner of the site in an isolated low-lying area. This surface pond is completely separate from the Red Swamp Brook and does not form part of any creek or river system.

The topography of the site is undulating, and slopes down towards the northern boundary, forming a valley where Toodyay Road and Red Swamp Brook lie. The land directly north of the site slopes upwards.

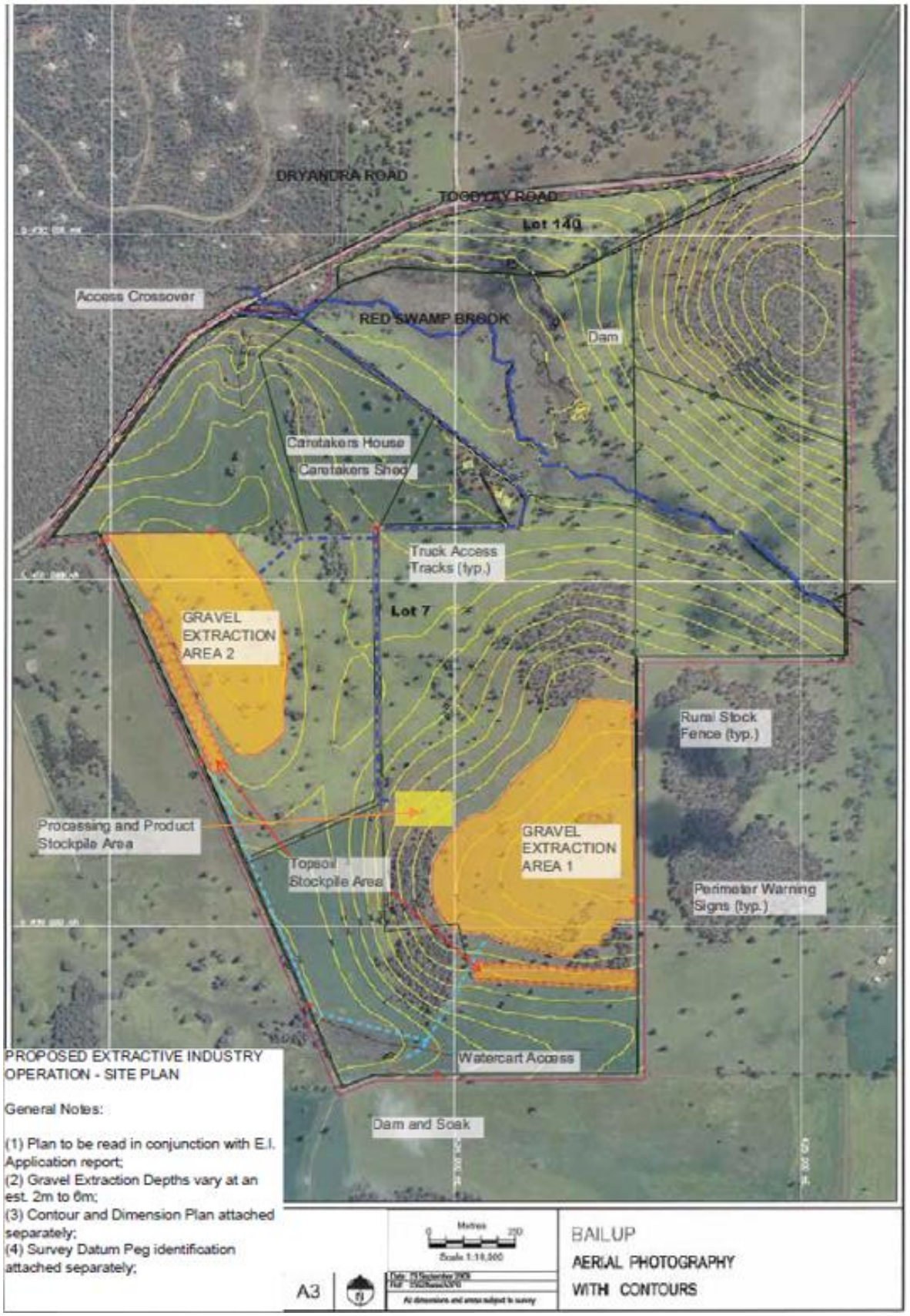
Proposal:

The proposal seeks to increase the amount of gravel extracted annually from site from 47,000 tonnes per annum, to 950,000 tonnes per annum. The location, depth and total area of excavation will remain unaltered from the existing approval.

The extraction, rehabilitation and revegetation of the site will also be completed in stages consistent with the existing approval. The progress of each stage of excavation will vary depending on market forces. The increase in annual extraction is sought to enable greater flexibility to meet market demand as required. However it is unlikely that the maximum amount of 950,000 tonnes of gravel extraction will occur every year. The proponent estimates the initial yield to be 150,000 tonnes per annum (tpa) in the first year and then increasing to 950,000 tpa over time. The average annual tonnage is estimated at 500,000 tpa.

Extraction will occur via two excavation pits that have a combined area of 40 hectares. The location of the two excavation pits are within areas predominantly denude of vegetation. The proposed depth of the pits will be between 2 - 6 metres deep (average 3 metre depth). No blasting is proposed for the extractive operations.

Figure 2: Site Plan - Proposed Extractive Industry Operation



Extraction Area 1 is the first area to be excavated, with preliminary works currently underway on site. Extraction will occur progressively in stages to minimise the total area of disturbed surface on site. Each stage will consist of a maximum excavated area of 2-3 hectares at a time.

At the cessation of each stage, rehabilitation will occur sequentially to support the future long-term use of the site. Excavation of Area 1 is proposed to be staged over a 10 year period.

Prior to excavation works commencing within Extraction Area 2, an acoustic noise barrier is required to be constructed along part of the western side boundary. This is to ensure the development will comply the *Environmental Protection (Noise) Regulations 1997* due to the proximity of an uninhabited dwelling on the adjoining property to the west at 445 Squarcini Close. The dwelling is approximately 200m away from Extraction Area 2.

All topsoil and overburden (unsuitable as gravel product) will be stockpiled directly adjacent to the extraction areas up to an approximate height of 4m. This material will then be used post excavation for the rehabilitation of the land. The revegetation plan will incorporate the planting of a greater number and larger area of native vegetation on site than what existed pre-development. Only local plant species endemic to the area will be planted.

An existing dam/soak located within the south western corner of the site is to be used as the water supply for onsite operations, including dust suppression.

The processing of gravel will consist of crushing and screening only. The processing area is located in a topographical depression midpoint the two extraction areas (approximately 15-25 metres lower than excavation areas). This mitigates dust and noise emissions, and visually conceals this area from public view. The basic raw material and finished gravel product will be stockpiled within the processing area and managed for dust. The gravel stockpiles will be up to 8 metres high and will be obstructed from view from surrounding properties due to the topographical landform. Gravel product may be stockpiled for up to three months, depending on market demand. A processing plant consisting of a 25m long by 5m wide crusher and generator will be temporarily located within this area during operations. The existing residence located to the north will be utilised as a site office and will provide ablution facilities for workers.

The operating hours are proposed to be consistent with the existing approval, operating year round, from Mondays to Saturdays between the hours of 7am – 5pm. However during the wetter months of the year, little to no production will occur.

An increase in annual gravel extraction will equate to higher volumes of gravel being processed on site, and an increase in haulage of the material from site on an annual basis.

During **peak periods** of operation, this increase would potentially allow for:

- Increase in daily crushing volumes from approximately 200 tonnes per day to 3000-4000 tonnes per day;
- Increase in daily truck movements to and from the site from 20 to 132 movements per day via larger capacity trucks (50 tonne capacity as opposed to 40 tonne capacity);
- Increase in average daily water use from 45kL to 90kL from the onsite soak; and
- Potential increase in the temporary stockpiling of gravel product on site.

The applicant has submitted detailed management plans for the control of dust, noise and stormwater, which have been reviewed and approved by the environmental regulatory authority DWER. The management of these impacts are discussed further within this report.

A Traffic Impact Assessment (TIA) was also prepared for the proposal to assess the impact of the increased number of heavy vehicle movements entering and exiting the site and utilising Toodyay Road. Various site intersection and road upgrades are proposed to accommodate the increase in heavy vehicle movements and improve sight lines to comply with Main Roads requirements. The traffic and road implications are discussed further within this report.

A complaints procedure has also been formulated by the proponent to investigate and resolve any complaints received as result of operations.

STATUTORY / LEGAL IMPLICATIONS

Planning and Development Act 2005

Planning and Development (Local Planning Schemes) Regulations 2015

Metropolitan Region Scheme (MRS) Clause 32

Shire of Mundaring Local Planning Scheme No. 4 (LPS 4)

Shire of Mundaring Extractive Industries Local Law 2013

The approval process for a Gravel Extractive Industry use at Local and State Government levels is outlined below:

Local and State Government Approval Process

The subject lot is zoned 'General Agriculture' under the Shire's LPS 4. An 'extractive industry' is an 'A' use in the General Agriculture zone and requires development approval in accordance with LPS 4.

The subject lot is zoned 'Rural' under the Metropolitan Region Scheme (MRS). In accordance with Clause 32 of the MRS, extractive industries within the Rural zone require development approval by the West Australian Planning Commission (WAPC) under the MRS. Therefore dual development approval is required for the proposal by the Shire and WAPC.

Once development approvals are obtained, the proponent needs to apply to the Shire for an Extractive Industry Licence (EIL) in accordance with the Shire's Extractive Industry Local Law. A licence can extend up to a period of 21 years, and is subject to annual renewal.

Department of Water and Environment Regulation (DWER) Approval Process:

Under Part V of the *Environmental Protection Act 1986 (EP Act),* an extractive industry that has a throughput of extracted material that exceeds 50,000 tonnes per annum will also require a works approval and licence approved by the Department of Water and Environment Regulation (DWER). The works approval and licence regulates industrial emissions and discharges to air, land and water that may be caused through the crushing, screening and processing of gravel on site. As part of the works approval process, a clearing assessment for the removal of any trees/vegetation on site will also be conducted.

Environmental Protection Authority (EPA) Approval Process:

For sites considered 'environmentally significant', or where the proposal is likely to cause considerable impact to the environment, DWER will consider referral of the application to

the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986* for an Environmental Impact Assessment (EIA).

Timeframe

On 8 April 2020, the Minister for Planning issued a Notice of Exemption pursuant to the *Planning and Development (Local Planning Schemes) Regulations 2015*, which, amongst other matters, grants an automatic two-year extension to all development approvals issued under a local planning scheme to respond, and recover from, the State of Emergency declared for the COVID-19 pandemic. If approved, the approval will allow for a four-year (instead of the usual 2 year) commencement period as per the Notice of Exemption.

POLICY IMPLICATIONS

State Planning Policy 2 – Environment and Natural Resource Policy

State Planning Policy 2.4 – Basic Raw Materials (2000) and Draft State Planning Policy 2.4 – Basic Raw Materials (2018)

State Planning Policy 4.1 – State Industrial Buffer Policy (1997)

Shire of Mundaring Local Planning Policy – Advertising Planning Applications

FINANCIAL IMPLICATIONS

Should Council resolve to refuse or conditionally approve the proposal, the applicant has a right of review through the State Administrative Tribunal (SAT), which will incur legal costs for the Shire.

STRATEGIC IMPLICATIONS

Mundaring 2026 Strategic Community Plan

Priority 1 - Community

Objective 1.1 – Healthy, safe, sustainable and resilient community

Strategy 1.1.8 – Ensure safety and amenity standards are upheld

Shire of Mundaring - Local Planning Strategy

The Shire's Local Strategy Background Document, which is to be read in conjunction with the scheme, upholds that planning strategies, schemes and decision making should identify and protect important basic raw material resources. Provision should be made for extractive industry use within the Shire, consistent with the purposes of State Planning Policies.

Under LPS 4, provision has been made for extractive industry uses only within the General Agriculture zone, to limit any potential off-site impacts. The proposal will provide for the extraction of a vital resource required for construction and road building materials, essential to the development of the State, and will assist with sustainable economic growth – an important consideration during the current economic recession.

SUSTAINABILITY IMPLICATIONS

Environmental Impacts

The following environmental impacts are regulated under the DWER works approval and licence.

Water usage

The environmental impacts associated with the proposed increase in gravel extraction will include an increase in daily water use from the on-site soak/dam for dust suppression and other site operations. The soak /dam is formed from surface water only, and is not sourced from ground water, or connected to any watercourse system (i.e. Red Swamp Brook). The availability of water will be dependent on the recharge of the soak from seasonal rainfall. Estimates for annual rainfall indicate the recharge of the soak will be more than adequate to provide for the required increase in water use. Water carts will be used if there is insufficient water available from the soak.

Erosion and sedimentation

An increase in water use for dust suppression may create additional overland water flow issues from the works area. Stockpiling of gravel product will also increase on site therefore stormwater management of these areas will be required to control erosion and potential sedimentation of the Red Swamp Brook. A stormwater management plan has been prepared to mitigate these risks.

Groundwater contamination

Fuel is proposed to be stored on site, which has the potential to contaminate groundwater. In order to minimise this risk, all diesel tanks are to be mounted on a concrete pad, and all tanks are to be double-skinned. A hydrocarbon spill kit must be mounted next to the fuel tank at all times.

To ensure sufficient separation between ground water levels, final excavation depths will be no deeper than 285m AHD, consistent with the existing approval.

Dust impacts

Dust and noise emissions will also increase with greater volumes of gravel being extracted, processed and transported off site. An increase in dust emissions has the potential to impact the water quality of Red Swamp Brook. During the course of operations, samples of water will be taken upstream and downstream from Red Swamp Brook at monthly intervals and analysed to ensure water quality is sustained.

Vegetation Clearing

There will be no additional impact on the amount of clearing required within the site for excavation. The location and overall area of the proposed gravel pits will remain the same as the existing proposal.

If approved, the proposal will require the removal of additional vegetation along the road verge of the property adjacent to Toodyay Road, to ensure compliance with Main Roads safety requirements for sight lines for vehicles.

Social Impacts:

An increase in dust and noise emissions resulting from the increase in extraction, processing and haulage of gravel could have a negative impact on the health and quality of lifestyle of the surrounding community if these emissions are not managed appropriately.

The management of stormwater is also pertinent to prevent sedimentation and/or pollutants entering the Red Swamp Brook to the north, which is a non-potable water source to residences further down-stream.

Given the type of extractive industry, odour emissions will be minimal and unlikely to be detected from site. Odour emissions will be generated from exhaust gases from machinery and vehicles only. Light emissions from site will also be minimal given the day time hours of operation. Vibration impacts will be limited to earth moving machinery and truck movements. No blasting is proposed as part of the extraction process.

An extensive assessment has been carried out by DWER on the potential impacts to air quality, water pollution and environmental noise. Detailed management plans to control the main types of emissions of dust, noise and stormwater run-off have been prepared by the applicant and approved by DWER as part of the works approval and licence process. The continuous management of these impacts will be required to safeguard the amenity of surrounding communities.

To ensure public safety, access to the site will be restricted and appropriate warning signs identifying the site as an extractive area will be placed at the entrance to the site. Advanced warning signs will be erected at appropriate locations along Toodyay Road to warn motorists of heavy vehicle movements.

Economic Impacts:

The proposal will provide for the extraction of gravel in a non-urban area of the metropolitan region to enable a ready supply of essential basic raw materials close to sources of demand throughout the metropolitan region. This resource is a broad state-wide resource and critical for many road construction projects. The availability of gravel will likely become even more important to assist state investment and spending post the Covid pandemic.

This will subsequently facilitate employment opportunities throughout the greater metropolitan region, especially within the construction industry.

RISK IMPLICATIONS

Risk: Reputation (Social / Community)

If Council approved the application, as recommended, there may be localised opposition.

Likelihood	**Consequence**	**Rating**
Possible	Minor	
Action / Strategy		
Extractive industries are heavily regulated and in this instance all relevant State agencies have approved the proposal and associated management		

plans. Any concerns or issues raised by the public in relation to the proposal will be promptly addressed by the Shire and in coordination with any external agencies as required.

EXTERNAL CONSULTATION

The application was initially advertised for public comment for a period of 21 days in accordance with the Shire's Local Planning Policy (LPP) *Advertising Planning Applications* for 'significant' development applications.

Due to public request and the upcoming Christmas holiday period, the advertising period was subsequently extended up to the maximum 14 days permitted in accordance with the *Advertising Planning Applications* Local Planning Policy.

The proposal was advertised as follows:

- Letters to all landowners within 500m of the boundaries of the site (as provided within the Shire's *Extractive Industry Local Law 2013*);
- Letters to relevant local and state government agencies;
- Sign on Site; and
- Advertised on Shire website

A total of 100 submissions were received, all objecting to the proposal.

A summary of the objections are listed below, (full copies can be provided to Council on request). Further comment addressing each objection can be found within the relevant sections of this report (as specified in the table below).

Table1: Summary of submissions

Issue / Concern Raised	Section/s of report which address objection (refer to Comment Section)
Road safety / traffic management	• Road safety / traffic management
Noise pollution	• Noise management
Dust pollution	• Dust management
Water management (impact on water bodies)	• 5.7.5 Watercourse protection • 5.7.6 Stormwater drainage • 5.11.2 Dams
Vegetation removal / loss of wildlife habitat	• Environmental Assessment • 5.7.8 Landscaping requirements • 5.7.12 Vegetation protection • 5.7.14 Rehabilitation of Land
Impact on local tourism	• Local Tourism Impacts
Impact on visual amenity /	• 5.7.11 Preservation of Amenity • 5.7.27 External storage areas

landscape values	• 5.11.7 Development setbacks
Increased bush fire risk	• 6.5. Bush Fire Hazard
Impact on property values	N/A - non-planning matter
Potential Bauxite Mining	N/A – not proposed within application
Potential refuse site	N/A - not proposed within application

Objections that relate to non-planning matters, such as the impact on property values, are not able to be sustained.

Objections raised regarding the potential use of the site for bauxite mining or as a refuse site cannot be considered, as these uses are not proposed. The application is for the use of the site for gravel extraction purposes only.

Local / State Government Comments

Shire of Toodyay:

Raised concerns and objected to the proposal on the following grounds:

"1. The additional traffic and road safety concerns on Toodyay Road;
2. The potential amenity impacts on Morangup residents; and
3. Potential environmental impacts including the water table.

"…If however the Shire of Mundaring chooses to conditionally approve this proposal it is requested strenuous conditions be imposed in relation to:
1. *Traffic management/ road safety upgrades including limiting truck movements;*
2. *Hours of operation as already has been listed;*
3. *Noise control;*
4. *Dust management;*
5. *Protection of the water table which includes water monitoring requirements; and*
6. *Regular compliance inspections."*

The concerns raised by Shire of Toodyay have been addressed further within this report (as detailed in table above).

Issues regarding dust, noise, stormwater management, surface and ground water protection / monitoring, and compliance inspections are requirements covered under the proponent's DWER works approval and licence.

City of Swan

"At this time the City is not prepared to support the proposal in its current state without a traffic assessment validating the appropriateness of traffic management practices and the extent and locations of road/egress improvement if any.

Should the Shire of Mundaring resolve to support the application, the City recommends that conditions are enforced to ensure the management procedures identified in the Noise,

Dust, Stormwater and Traffic Management Plans are adhered to, to prevent any adverse impacts on the locality."

Subsequent to this a Traffic Impact Assessment (TIA) was prepared by Shawmac Traffic Engineers on behalf of the applicant and submitted to Main Roads for comment.

A copy of the TIA was also forwarded to the City of Swan and Shire of Toodyay for comment.

No additional comments were received with respect to the development from City of Swan or Shire of Toodyay.

Department of Water and Environment Regulation (DWER)

As previously stated, the Department of Water and Environment Regulation (DWER) has carried out an extensive risk assessment on the environmental impacts of the proposal as part of the works approval and licence for a 'prescribed premises' as defined under Schedule 1, Category 12 of the *Environmental Protection Regulations 1987*.

In addition to the works approval (issued August 2016) and licence (issued April 2017), DWER provided the following advice with respect to the application:

"*The Department of Water and Environmental Regulation recommends that stormwater management be in accordance with the Stormwater Management Manual of Western Australia (DoW, 2004-2007)."*

Main Roads

Main Roads requested a Traffic Impact Assessment (TIA) be submitted for the proposal to enable a detailed assessment of the potential traffic implications caused by an increase in heavy vehicles utilising Toodyay Road, and to assess the Toodyay Road / site access intersection for its viability and safety.

A TIA was prepared by Shawmac Traffic Engineers on behalf of the applicant and submitted to Main Roads for comment.

After several revisions of the TIA, and an exhaustive design assessment, Main Roads have confirmed support of the application, based on the following site intersection upgrades and amendments:

- An acceleration lane for vehicles exiting the site in a south westerly direction onto Toodyay Road;
- A channelised right turn to allow vehicles to turn right off Toodyay Road without affecting the flow of traffic travelling behind;
- Ceding a portion of the front boundary of the site to Main Roads for road reserve, to ensure sufficient vehicle sightlines are achieved to Main Roads' requirements; and
- Road traffic signs to be installed to the east and west approaches of the site access, to warn motorists of the upcoming site access and potential truck (i.e. road trains) entering Toodyay Road.

The revised application complies with Main Roads requirements.

COMMENT

State Planning Policy 2.4 - Basic Raw Materials

The proposal will provide for the extraction of gravel in a non-urban area of the metropolitan region to enable a ready supply of essential basic raw materials (such as gravel) close to sources of demand throughout the metropolitan region.

SPP 2.4 highlights the importance that *"extraction of basic raw materials occurs with minimum detriment to the local amenity and environment, and in a manner that allows for future use and development consistent with the long-term planning intentions for the area".*

Another objective of SPP 2.4 is to facilitate the extraction of basic raw materials close to major markets within the Perth metropolitan area. Importantly, the policy stipulates that existing extractive industries, such as this, that operate under a regional planning scheme and a local planning scheme should continue to be protected in the short term, with eventual use of the land for other purposes.

The proposal is considered to be congruent with the intentions of SPP 2.4, where the staging of excavation and rehabilitation will help limit the impact on the environment, and reduce the visual impact on the surrounding rural landscape. Environmental impacts will be managed through a series of management plans, and the proponent is required to carry out on going monitoring throughout the course of operations. The rehabilitation and revegetation of the land will enable future long term use of the site for general agricultural purposes.

State Planning Policy 2 – Environment and Natural Resources Policy

SPP 2 outlines the following decision-making objectives for proposals concerning the extraction of basic raw materials:

- Identify and protect important basic raw material resources and provide for their extraction and use in accordance with SPP 2.4 Basic Raw Materials;
- Support sequencing of uses where appropriate to maximise options and resultant benefits to community and the environment; and
- Support, where possible, improved efficiencies in the production and consumption of basic raw material resources to ensure their availability for future environmental and human uses.

The proximity of the site to the Perth coastal plain area will assist with the availability of essential gravel resource close to demand. The staged methodology of extraction and rehabilitation will ultimately result in a net environmental improvement on site.

State Planning Policy 4.1 – State Industrial Buffer Policy (1997)

SPP 4.1 applies to all industry categories, including extractive industry uses, where on-site and off-site buffers are required.

SPP 4.1 states that basic raw material extraction uses are unique, as they provide essential materials used in the development of urban areas for buildings, roads and infrastructure. To ensure cost effectiveness of such operations, this often requires proximity to urban areas, where in some instances only smaller buffer areas are available. To offset reduced buffer distances, more emphasis is applied to implementing environmental management practices.

DWER has carried out an assessment of likely emissions of noise and dust to the closest sensitive land uses from the extraction areas. Through the employment of appropriate management practices, it has been demonstrated that the surrounding amenity (environmental, health and safety) can be suitably maintained.

Local Planning Scheme No. 4 (LPS 4)

Zoning and Use Class: The site is zoned General Agriculture and LPS 4 designates an 'A' use for extractive industries within this zone. The 'A' use requires the determining authority to exercise discretion to approve the use following compulsory advertising.

The suitability of the site to accommodate an extractive industry use within the General Agricultural zone has already been established through the existing development approvals issued.

The assessment of the proposal is focused on the increase of gravel extraction, processing and haulage of material per annum and the subsequent impacts such an increase will have on the environment and surrounding rural amenity.

The proposal has been assessed against development provisions of LPS 4 as follows:

Local Planning Scheme No. 4	
Scheme Requirement / Clause	Assessment / Comment
5.0 General Development Provisions 5.7.5 Watercourse protection 5.7.5.1 The minimum setback for all buildings and earthworks (including landfill) from the top of the bank of any watercourse shall be: (b) in the absence of a specific setback for a particular watercourse in a watercourse hierarchy and protection strategy adopted by the Shire, 20 metres in the Residential zone and 30 metres in all other zones, or such greater distance as may be required by the Shire in the case of watercourses within the Middle Helena Catchment Area or the Mundaring Weir Catchment Area. 5.7.5.2 Within the setback from a watercourse as specified in clause 5.7.5.1, all existing native vegetation shall be retained. 5.7.5.3 The natural flow of water within watercourses shall be maintained, and no development which would prevent the natural flow of water shall be approved, unless that development would, in the opinion of the Shire, restore or enhance the environmental health of the	Works will be located a minimum 600m away from the Red Swamp Brook. The proposed site does not fall within the Middle Helena Catchment Area or the Mundaring Weir Catchment Area. All existing native vegetation will be retained around the watercourse and surrounding wetland area. No works on site will interfere with the Red Swamp Brook. Ongoing monitoring of the water course will be carried out to ensure conservation of water quality.

watercourse. 5.7.5.4 Development adjacent to watercourses shall incorporate appropriate measures to minimise runoff and erosion and to protect water quality, including: (a) provision of contour banks to intercept and safely dispose of stormwater runoff; and (b) planting of local native vegetation to provide nutrient stripping and to act as a barrier to seepage and runoff. Such measures should be commensurate with the scale of the development and the level of potential adverse impact on the watercourse.	Stormwater management will be managed across the site to prevent erosion and potential sedimentation of the Red Swamp Brook (refer to stormwater management details below). Although no native vegetation will be affected around the banks of Red Swamp Brook or within the surrounding wetland area as a result of the proposal, additional planting of local native vegetation and weed eradication around the watercourse is a recommended condition of approval. This will improve the ecological state of the watercourse, and provide a beneficial offset to other environmental impacts associated with the proposal.
<u>5.7.6 Stormwater drainage</u> 5.7.6.1 Subdivision and development shall employ water sensitive urban design approaches to stormwater drainage. Any subdivision or development which increases the area of impermeable surfaces or which otherwise reduces stormwater recharge of groundwater systems, is to utilise best management practices to effect the retention of stormwater within the development area so as to: (a) minimise as far as practicable changes to both the rate and quantity of direct stormwater discharge from the site; and (b) prevent the export of water borne pollutants (including sediment load and nutrients).	Refer to comments below under • Stormwater Management
<u>5.7.8 Landscaping requirements</u> 5.7.8.1 Unless otherwise approved by the Shire, landscaping shall be provided as a component of all commercial and industrial development. 5.7.8.2 The area, distribution and type of landscaping of individual sites required by this Scheme shall be determined in the context of each proposed development, but shall be generally in accordance with the following principles:	Landscaping of the site will be carried out incrementally at the end of each stage of extraction. The revegetation of the site will incorporate significant replanting of native species across the site, to be replaced in larger quantities than the amount of vegetation removed, in order to enhance the outcome of rehabilitation. To improve the ecological function of the Red Swamp Brook, the removal of any weeds and additional planting of riparian

(b) landscaping shall consist primarily of local indigenous and low water-use species (with the exception of environmental weeds); (e) consideration should be given to the desirability of integrating landscape planting with stormwater management in order to achieve best practice water sensitive design outcomes;	vegetation along the watercourse is recommended.
5.7.9 Management of construction sites In addition to any requirements which may be imposed as conditions of planning approval, construction sites are to be managed so as to minimise soil erosion, sedimentation and/or the degradation of any water resource due to the action of wind or water and protect as far as practicable, the natural resource values of the site and of the adjacent area.	Comprehensive mitigation plans have been prepared for the management of dust and stormwater run-off to minimise soil erosion on site, and potential sedimentation of the Red Swamp Brook. Periodic sampling of water from the Red Swamp Brook will be undertaken during the course of operations to ensure water quality is maintained.
5.7.10 Dieback management Where, in the opinion of the Shire, a proposed development has the potential to cause the spread of *Phytophthora* dieback, the Shire may require the preparation, submission, approval and implementation of a dieback management plan incorporating measures to avoid or minimise the spread of *Phytophthora* dieback.	The Extractive Industry application report submitted by the proponent stipulates that the site is considered to be dieback free or 'low' dieback risk given the condition of vegetation within the surrounding region which does not show signs of infestation. No external soil is proposed to be imported to the site for the purposes of the extractive industry. For these reasons the risk of contamination or spread of dieback to the site is considered very low. Irrespective of this, given dieback cannot be solely identified by the condition of vegetation on site and may still be present within the soils, if the application is approved, it is recommended the proponent be required to prepare a Dieback Management Plan for preventing the spread of *Phytophthora dieback*, ensuring all machinery, particularly earth moving equipment is clean on entry and exit of the site.
5.7.11 Preservation of amenity 5.7.11.2 In order to avoid adverse impact on the visual amenity of an area, the Shire may impose conditions on any planning approval requiring: (a) the screening of the development by	Refer to comments below under: • Visual amenity

vegetation, with requirements relating to planting and/or maintenance of such vegetation; and/or (b) the siting of the development so as to avoid visually prominent locations on the land.	
5.7.12 Vegetation Protection 5.7.12.5 In considering and determining an application for removal of any tree or vegetation, the Shire shall take into account the following: (a) the desirability of minimising disturbance to the landscape characteristics of the locality; (b) whether there is a need for removal of the tree or vegetation to facilitate use of the land; (c) the intrinsic value of the tree or vegetation in terms of physical state, rarity and variety; (d) the existing and future amenity of the adjoining land and natural environment of the locality; (e) the effect on the environment of removing trees and/or vegetation; and (g) whether the vegetation is dead or diseased. 5.7.12.6 In addition to other matters set out in this Scheme, the Shire may impose a condition on any approval for removal of a tree(s) or vegetation, requiring replanting or revegetation elsewhere on the site to reduce or counteract any adverse impact from the removal of the tree(s) or vegetation being approved.	Clearing of 100 native trees is required for the proposed extraction areas. DWER has carried out a comprehensive assessment on the variety and quality of the native vegetation to be removed, and the impact the clearing would have on surface and ground water, and potential land degradation. The clearing was approved by DWER with no imposed conditions. The location of the excavation pits has been selected in areas predominantly denude of vegetation to limit the impact of the development on native vegetation. As part of the revegetation plan for the site, a larger quantity of replanting will occur over a greater area on site than what exists pre-development, to improve the likelihood of attaining adequate regeneration of the site
5.7.14 Rehabilitation of land 5.7.14.1 No person shall cause or allow land to be cleared, managed or degraded in such a way as to cause environmental harm, or to adversely affect the amenity of adjoining or nearby land by the creation of soil erosion or dust, or the alteration of surface water flows.	The rehabilitation and revegetation of the site will be carried out in progressive stages to minimise the extractive industry's impact on the environment and surrounding rural amenity. The exposed surface area for extraction will be limited to 2-3ha at a time, and will be subsequently rehabilitated at the end of each stage. The management of stormwater and dust impacts as a result of the extractive industry will be conducted throughout all

	stages of development to ensure minimal disturbance to the site and adjoining properties.
5.7.22 Vehicular access to major roads 5.7.22.2 The Shire may at its discretion apply the provisions of clause 5.7.22.1 to other major roads, being Regional Reserves for Primary Regional Roads or local reserves under the Scheme for Important Local Roads.	The application site is located off the primary regional road, Toodyay Road, and therefore Clause 5.7.22.1 should be applied to limit vehicular access to this main road. There is only one existing entry point to the site off Toodyay Road, which will require upgrading to Main Road requirements to ensure safe access and egress of heavy vehicles, and improve safety for motorists travelling within the area. There will be no other entry points to the site off Toodyay Road (or any other local road).
5.7.27 External storage areas All external storage of goods and materials, which in the opinion of the Shire may have an adverse visual impact, shall be effectively screened from view from any street, public place and any adjacent residence.	Temporary plant and equipment stored on site will consist of a 25m long by 5m wide crusher and associated generator, along with some earth moving machinery. The processing area and temporary plant area will be located at a topographical depression to help visually conceal this area from public view.
5.7.30 Light overspill Floodlights, spotlights and all other forms of lighting shall be constructed, oriented and controlled so as not to: (a) adversely impact on the amenity of any adjacent residents; or (b) cause a traffic hazard in the adjacent road network.	There will be no requirement for floodlights or spotlights for the extractive industry development, as the hours of operation will be during the day from 7am – 5pm.
5.11 Development requirements for the General Agriculture zone: 5.11.1 Local Natural Areas 5.11.1.1 Local Natural Areas are delineated in the Local Planning Strategy and are identified for either: (a) Conservation; (b) Protection; or (c) Retention 5.11.1.2 Where a lot is partly within one or more Local Natural Areas identified in the Local Planning Strategy, any development on that lot, including a Single House and associated structures (including outbuilding(s)), shall be:	No clearing of vegetation is proposed in Local Natural Areas (LNA) identified for protection on site. Some small pockets of vegetation will be removed that are identified for retention in the lowest Priority 3 level. The *Local Planning Strategy - Background Document* stipulates: "The **Retention** category incorporates Local Natural Areas with a relatively lower conservation value, largely

(a) located in that portion of the lot outside the Local Natural Area(s); and (b) set back sufficiently from the Local Natural Area so as to avoid any need to remove or modify vegetation within the Local Natural Area in order to comply with the requirements of the Planning for Bush Fire Protection Guidelines (2010) or any successor document in force within the Shire at the time.	because of their fragmented nature or the small existing or proposed sizes of lots on which they are located. However, this Strategy still recommends a strong presumption against clearing of Retention category Local Natural Areas except where unavoidable." The areas of excavation are mostly devoid of vegetation. The small pockets of LNA identified for retention that require removal will be marginal and unlikely to create significant detriment to the ecological values of the site. A clearing assessment has been approved by the environmental regulatory agency DWER, which supports this conclusion. Extensive rehabilitation is also planned.
<u>5.11.2 Dams</u> 5.11.2.1 In determining an application for planning approval for a dam, the Shire shall have regard for the following principles: (a) there is a very strong presumption against the construction of dams within a watercourse; (f) dam design and structure is to provide for safe disposal of overflow (water in excess of dam capacity); and 5.11.2.3 An applicant for planning approval for a dam may be required to provide expert advice from a structural engineer and/or hydrogeologist that the proposed dam is consistent with the principles in clause 5.11.2.1 above. 5.11.2.4 An application for a dam may be referred to the Department of Water for comment. In determining an application for a dam, the Shire shall have regard to any advice or recommendations received from the Department of Water.	There is an existing soak / dam within the south western corner of the site, which is situated at a depression point where water ponds on the surface. This wet area is completely separate from Red Swamp Brook and it does not form any type of creek or river system, nor is it sourced from ground water. A hydrogeological report was undertaken for the use of this soak/dam as a water source for onsite activities including dust suppression. The report identified that the soak/dam should be capable of supplying sufficient water for onsite activities, based on its estimated annual recharge from rainfall of 45,000kL per annum. An estimated 26,910kL of water will be required annually for dust suppression and other onsite activities. DWER were consulted on the proposed use of this soak/dam, and confirmed that the proponent *"does not require a licence (to regulate consumption) as water is being taken from an existing dam/soak which is not creek or bore fed".*
<u>5.11.7 Development setbacks</u> All development, including outbuildings, shall be set back a minimum of 20 m from all lot boundaries	Given the nature of an extractive industry use, the 20m development setbacks to all lot boundaries will be a condition of approval to minimise any potential off site

	impacts.
6.5 Bushfire Hazard 6.5.6 An application for development approval must be accompanied by: (a) a bushfire attack level assessment carried out in accordance with the methodology contained in the Planning for Bush Fire Protection Guidelines (2010); and (b) a statement or report that demonstrates that all relevant bushfire protection acceptable solutions, or alternatively all relevant performance criteria, contained in the Planning for Bushfire Protection Guidelines (2010) have been considered and complied with, and effectively address the level of bush fire hazard applying to the land.	The extractive industry use is not classed as a 'vulnerable' or 'high risk' land use in accordance with the *Guidelines for Planning in Bushfire Prone Areas*, and therefore the application did not require referral to DFES. The site is predominantly cleared of vegetation and therefore many areas across the site fall within a "low" bush fire risk. No blasting is proposed for the extraction works. No additional buildings are to be constructed. The existing dwelling on site will be used as an office, lunchroom and provide ablution facilities for workers. Therefore no Bushfire Attack Level Assessment (BAL) is required for the proposal. Firebreaks will continue to be managed in accordance with the Shire's Firebreak and Fuel Load Notice. The presence of onsite operators will increase visual supervision of the site and its surroundings in the event of a fire. Water trucks used for the suppression of dust will also be readily available to water down areas if required in an emergency. The development is therefore not considered to increase the risk of bush fire.
Planning and Development Regulations (Local Planning Schemes) (2015) deemed provisions Part 9 Clause 67 - Matters to be considered by local government:	
(c) any approved State planning policy	The proposal is consistent with: • SPP 2 - Environment and Natural Resources Policy, and • SPP 2.4 – Basic Raw Materials
(m) the compatibility of the development with its setting including the relationship of the development to development on adjoining land or any other land in the locality including, but not limited to, the likely effect of height, bulk, scale, orientation and appearance of development;	The compatibility of the site for extractive industry purposes has been established given the planning approvals already issued. Refer to comments above under: • 4.2.4 General Agriculture In terms of the visual amenity impacts of the development, refer to comments

	under: • 5.7.11 Preservation of Amenity • 5.7.27 External storage areas • 5.11.7 Development setbacks
(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	(i) Refer to comments above under: • SUSTAINABILITY IMPLICATIONS: Environmental Impacts (ii) Refer to comments above under: • 4.2.4 General Agriculture (iii) Refer to comments above under: SUSTAINABILITY IMPLICATIONS: Social Impacts
(o) the likely effect of the development on the natural environment or water resources and nay means that area proposed to protect or to mitigate impacts on the natural environment or water resource;	Refer to comments above under: • SUSTAINABILITY IMPLICATIONS: Environmental Impacts • 5.7.5 Watercourse protection • 5.7.6 Stormwater drainage • 5.7.12 Vegetation protection • 5.7.14 Rehabilitation of land
(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;	Refer to comments above under: • 5.7.8 Landscaping requirements • 5.7.12 Vegetation protection • 5.7.14 Rehabilitation of land
(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;	The site does not fall within a flood prone area. Given the existing soil types and landform of the property, the site is not classified as high quality 'priority' agricultural land. With regards to potential land degradation, soil erosion and bush fire risk, refer to comments above under: • 5.7.6 Stormwater drainage • 5.7.12 Vegetation protection • 5.7.14 Rehabilitation of land • 6.5 Bush Fire Hazard

(r) the suitability of the land for the development taking into account the possible risk to human health or safety;	Refer to comments above under: • SUSTAINABILITY IMPLICATIONS: Social Impacts
(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;	(i) Refer to comments below under: • Road safety / traffic management (ii) The loading of trucks with gravel product will occur within the processing and stockpiling area located at a topographical depression point midway between the two Extraction Areas. Existing internal access tracks provide direct access for trucks to this processing area. The area is sufficient for the manoeuvring and parking of heavy 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 probably effect on traffic flow and safety;	Refer to comments below under: • Road safety / traffic management
(x) the impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals	As previously discussed, the impact the development will have on the residents located within the immediate area concern visual amenity, potential off-site impacts such as noise and dust from the proposed works, and stormwater management to control erosion and sediments entering the Red Swamp Brook, which is a non-potable water source to residences downstream of the site. Comprehensive plans for the control of dust, noise and stormwater have been prepared to manage these impacts. Visual amenity impacts have been discussed below under “Visual Amenity”. The impact the development will have on the general local community include a concern with the increase in heavy vehicle movements to and from the site and the traffic safety implications this may have along Toodyay Road. These issues are discussed under the “Traffic Impact Assessment” section of this report detailed below. The impact the development will have on

	the broader community of the Perth metropolitan area will be one of benefit, as it will provide a vital basic raw material resource close to sources of demand, which will assist with sustainable economic growth of the State.

Environmental Assessment:

There are some mapped Local Natural Areas (LNA) of vegetation identified for protection located within the north eastern portion of the site, surrounding the Red Swamp Brook area. The location of the gravel pits will be located a substantial distance away from these areas of protected LNA.

The Department of Biodiversity, Conservation and Attractions (DBCA) has confirmed that the subject site contains no records of declared rare flora or endangered fauna, and no threatened species have been found within proximity to the development that may be considered at risk from industrial disturbances. The project area was also found to provide insufficient habitat for ground dwelling animals, given the predominant absence of native mid-storey and groundcover vegetation.

A 'Black Cockatoo Habitat Assessment' was undertaken in 2010 by a qualified zoologist, as a prerequisite for the original planning application. The report concluded that there was no evidence of previous roosting sites identified on site and *"overall the potential impact of the proposal on black cockatoos can be considered to be extremely low given the area of potential habitat to be cleared is small, and there are only two potentially inhabitable trees. Existing black cockatoo populations using the general area will not be significantly affected by the loss of this small area of habitat".*

An analysis investigating the presence of Acid Sulfate soils (ASS) on site was also undertaken as part of the original application. Soil mapping identified the low-lying area in the central north part of the site which covers part of the Red Swamp Brook area and the surrounding wetlands as highly probable for ASS. No excavation is proposed within the Red Swamp Brook or surrounding wetland area and therefore the probability of encountering ASS is extremely low. Soil mapping of all other areas of the site (including the areas of excavation) are identified as extremely low probability of potential ASS.

Separation Distances

The Environmental Protection Authority's (EPA) '*Separation Distances between Industrial and Sensitive Land Uses'* guides the establishment of formal buffers to protect community health, safety and amenity.

For an extractive industry involving the excavation of hard rock with no blasting conducted, the buffer distances are assessed on a 'case by case' basis.

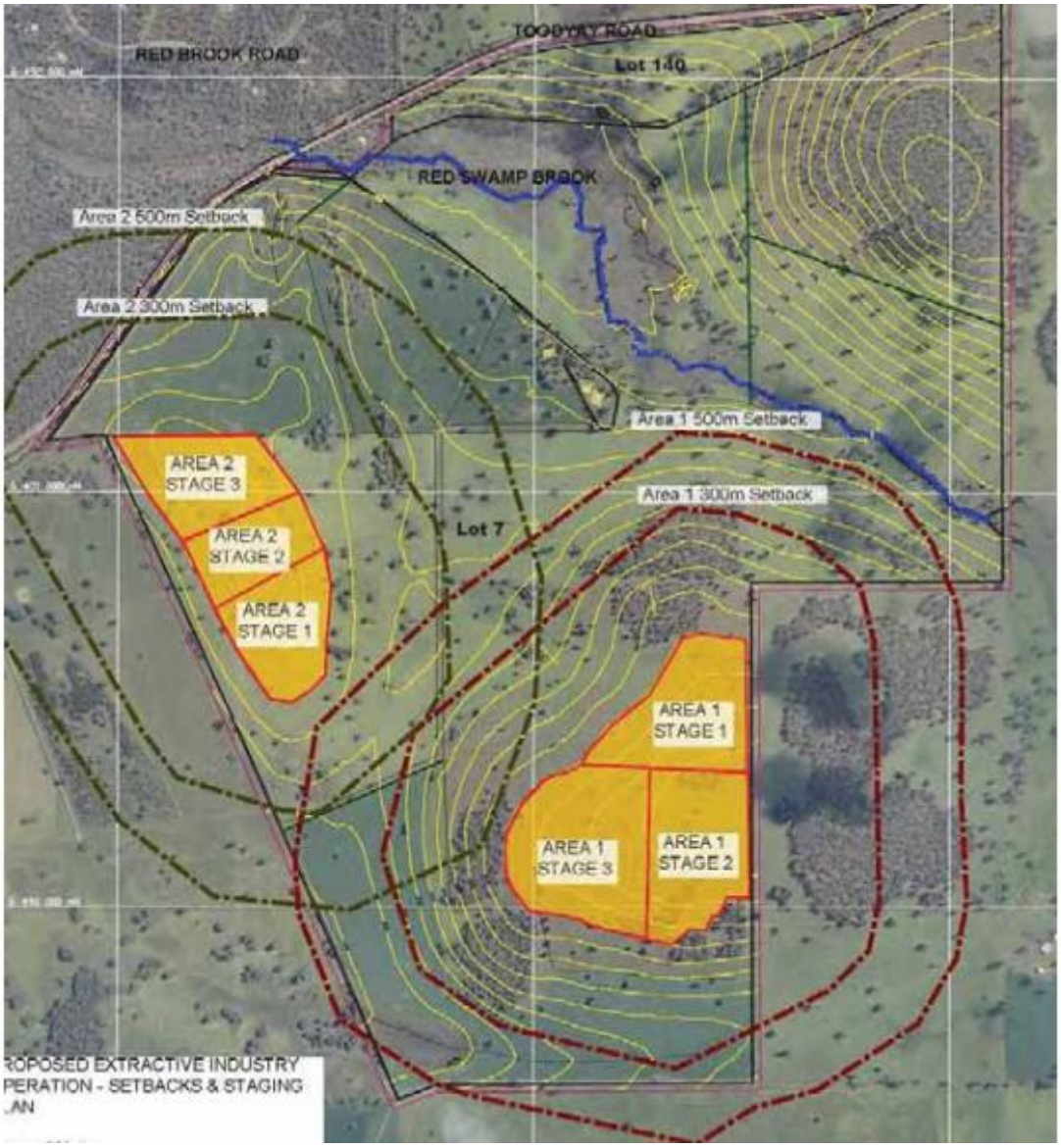
Recommended separation distances for sand and limestone type of extraction are between 300m–500m, while distances for the most intense rock mining which require blasting for all extraction activity require 1000m. The gravel extraction use is considered similar to limestone extraction, as it uses similar type of plant and equipment.

Possible impacts to surrounding sensitive land uses are dust and noise, which are discussed further below under “Dust Management” and “Noise Management”.

The closest residential properties (known as sensitive land uses) are:

- An uninhabited house on the adjoining property to the west at No. 445 Squarcini Close, located approximately 200m away from Extraction Area 2;
- A house on the adjoining property to the south east at Lot 1 Toodyay Road, located 750m away from Extraction Area 1; and
- A housing development located north of Toodyay Road, consisting of rural land holdings located a minimum 1.5km away from Extraction Area 1 and a minimum 750m away from Extraction Area 2.

Figure 3: Separation distances - 300m and 500m from Extraction Areas



Assessment of the noise level impacts of the extraction and processing of gravel indicated that separation distances to surrounding sensitive land uses were sufficient to comply with the *Environmental Protection (Noise) Regulations 1997.* Only one identified risk to a nearby sensitive land use was identified, being the uninhabited house to the west at No. 445 Squarcini Close. An acoustic noise barrier (or bund) will be required along a portion of

the western boundary to ensure excavation at Extraction Area 2 will comply with the *Environmental Protection (Noise) Regulations 1997*.

Continuous dust monitoring devices will be set up along the eastern boundary adjacent to Extraction Area 1 and the western boundary adjacent to Extraction Area 2.

The existing separation distances are considered acceptable based on the assessment of the possible impacts and mitigating measures that are to be applied by the proponent.

Visual amenity:

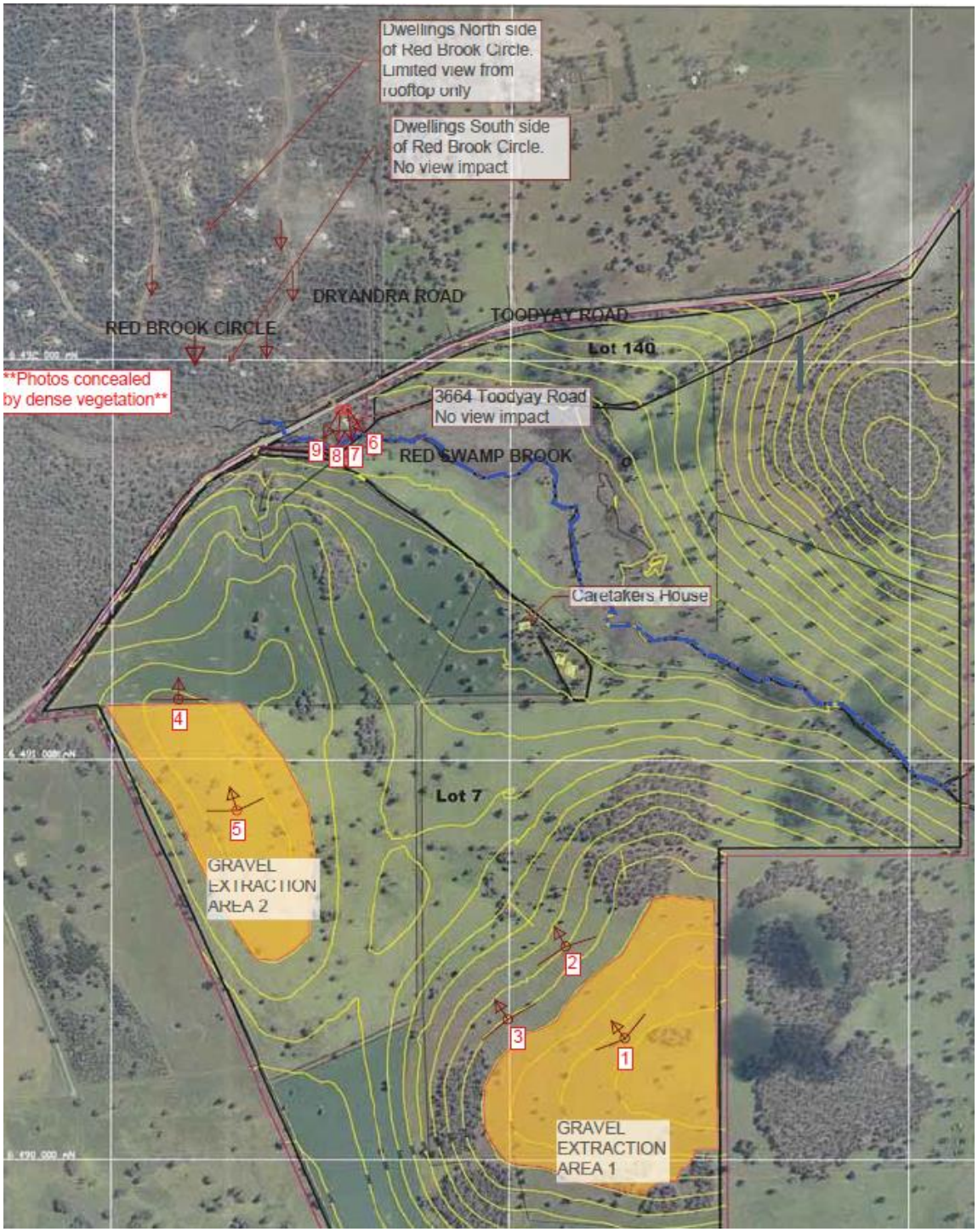
Visual amenity and landscape values have been assessed under the current development approval as not being of adverse impact. The same land use and areas of activity are proposed in this application.

Visual impact to surrounding residences

Excavation and rehabilitation will occur incrementally over a maximum area of 2-3 hectares at a time to minimise the overall visual impact of the development on surrounding rural properties.

The processing area for the storage of temporary plant and equipment and for the stockpiling of gravel product will be located within a topographical depression between the two excavation pits to help visually conceal this area from surrounding views. This area is located in a valley approximately 15-25 metres lower than the excavation areas. Topographical landforms to the northern section of the site creates a visual barrier for the gravel stockpiles, which will be up to a maximum height of 8 metres.

Figure 4: Visual amenity – houses to north



Areas of excavation and stockpiling of topsoil will be marginally visible to some dwellings situated to the north of Toodyay Road. Topsoil and overburden stockpiling will be located adjacent to staged works up to a height of 4m. This material will be used immediately after each stage of excavation for rehabilitation of the land. These rural residential properties to the north of Toodyay Road are located a minimum 1.5km away from Extraction Area 1 and a minimum 750m away from Extraction Area 2. Therefore views of excavation works and topsoil stockpiling are distant and partly obscured due to the undulating topography of the site and existing vegetation. The development is therefore not considered to create adverse visual impact to these properties.

Figure 5: Views from Extraction Area 1 looking north towards houses

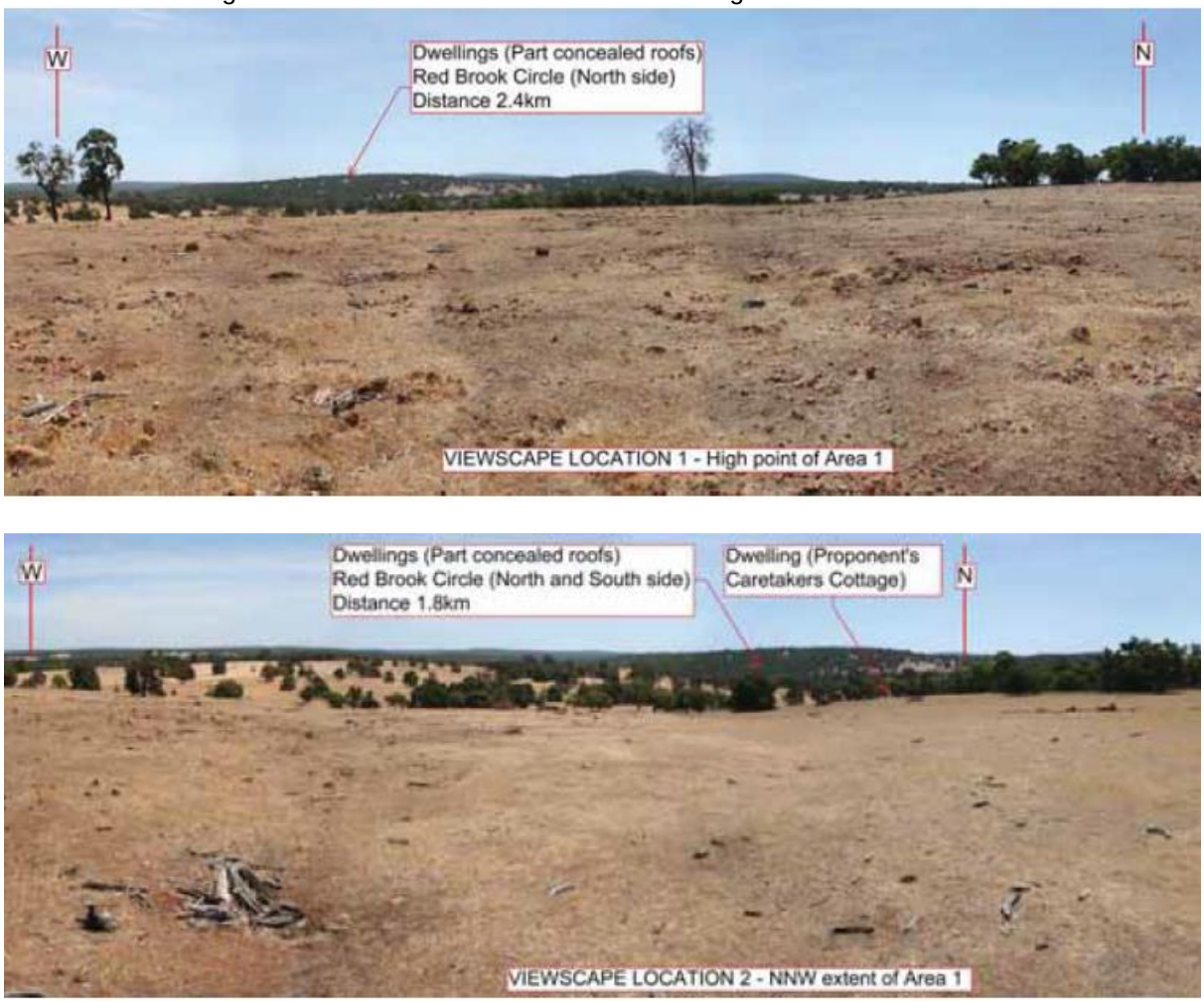
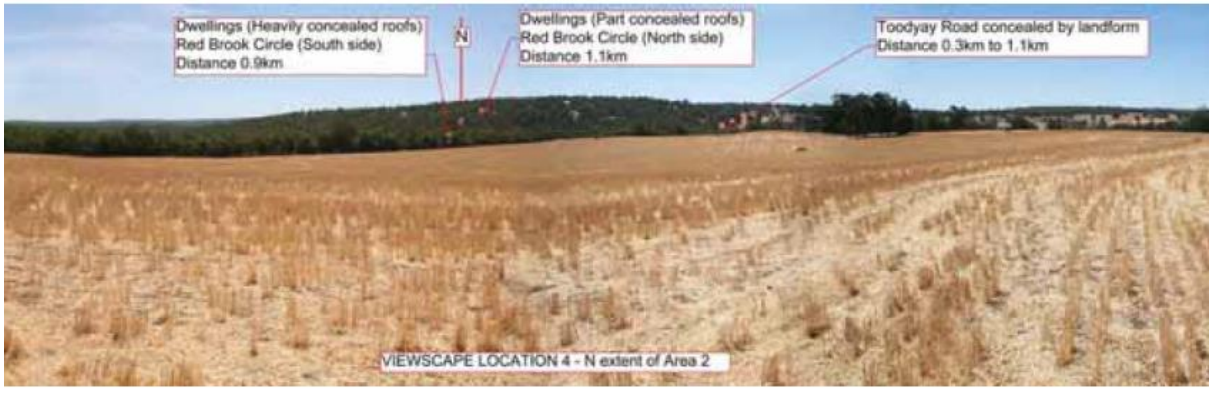
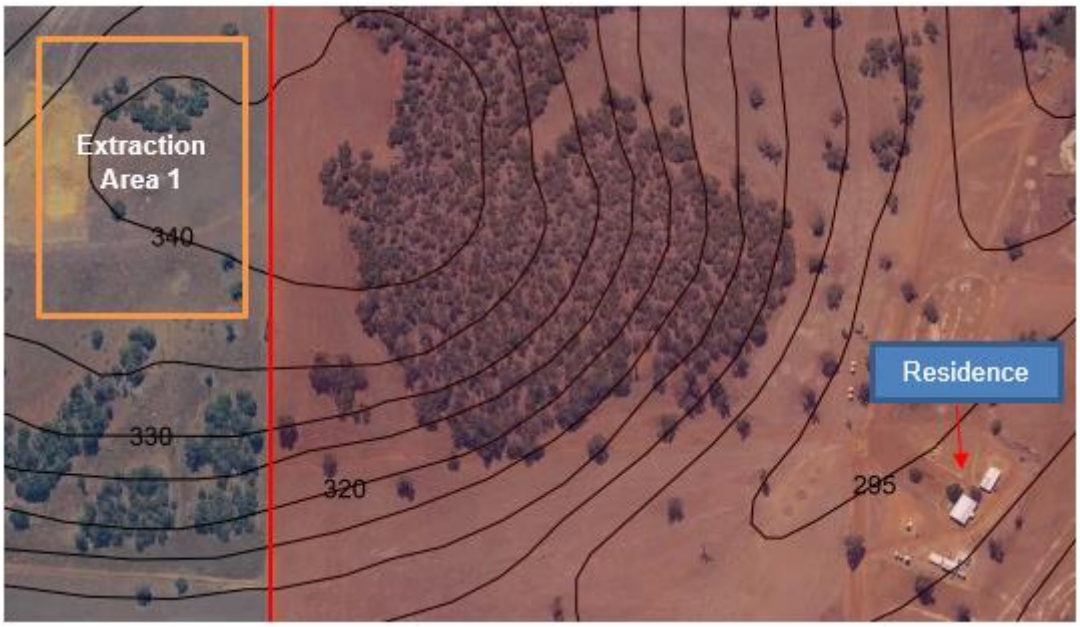


Figure 6: Views from Extraction Area 2 looking north towards houses



The residence on the adjoining property to the south east located 750m away from Extraction Area 1 sits within a topographical depression 50m lower than the excavation area. The extractive operations are substantially screened from this resident's view by a large 300m wide, 14 hectare area of vegetation which lies upslope to the residence and in front of the excavation area.

Figure 7: Residence 750m south east of Extraction Area 1 - screening vegetation

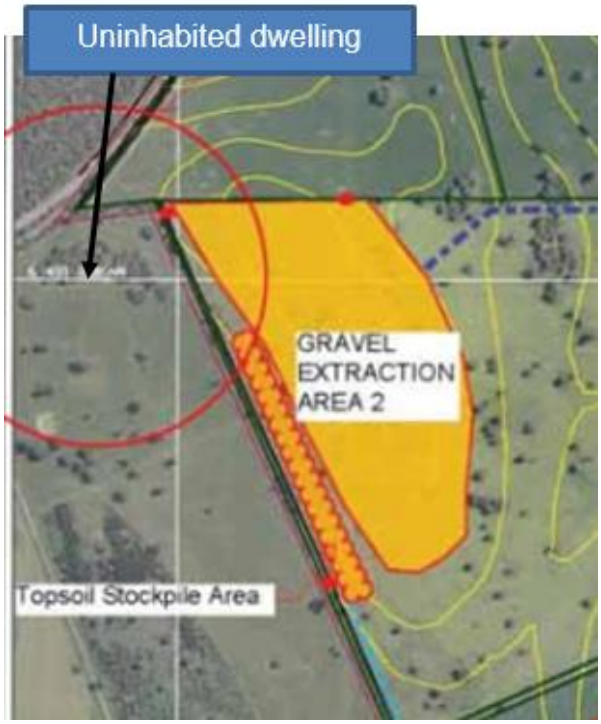


Visual Impact of Acoustic Barrier

A 10m high, 20m long acoustic barrier / noise bund is required along the western boundary of Extraction Area 2. The noise barrier is required due to the proximity of an uninhabited house located 200m from Extraction Area 2 on the adjoining property at No. 445 Squarcini Close, Bailup.

If the development is approved, the acoustic barrier will be required to be set back a minimum 20m away from the western boundary and will be visible to potential future occupiers of this dwelling. The bund will only be required during the course of excavation works in Extraction Area 2. Once excavation is completed within Area 2, the bund will be removed and the area will be revegetated consistent with the rest of the site.

Figure 8: Location of uninhabited residence



The acoustic barrier is proposed to be constructed as an earthen bund, with grass seeding implemented across the surface to stabilise the bund and to provide a permanent dust suppression method. This will give the bund the appearance of a grassed hill. Additional landscaping along this portion of the western boundary is recommended but must not intercede with the location of the firebreak on the boundary. The bund will function both as an acoustic barrier and a visual screen to excavation works within Extraction area 2.

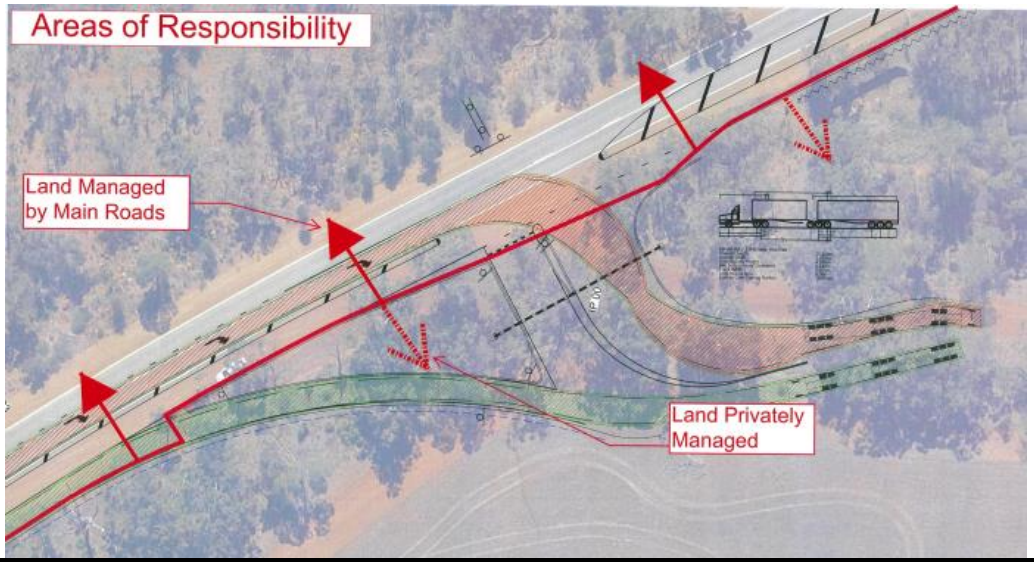
Figure 9: Location of noise bund required for Extraction Area 2

Visual impact from Toodyay Road

Views of the extractive operations to motorists travelling along Toodyay Road are not discernible due to the undulating landscape and presence of existing vegetation on site and along the road verge.

Site intersection upgrades are proposed that will incorporate a channelised right turn treatment into the site and an acceleration lane for vehicles exiting the site in a south west direction. Some vegetation along the road verge, predominantly to the western side of the site access will require removal to ensure vehicle sightlines meet Main Roads' requirements. This will require a portion of the front boundary of the site to be ceded as road reserve to Main Roads to ensure these sight lines are maintained in perpetuity.

Figure 10: Acceleration lane, auxiliary right turn & indicative portion of site to be ceded as road reserve



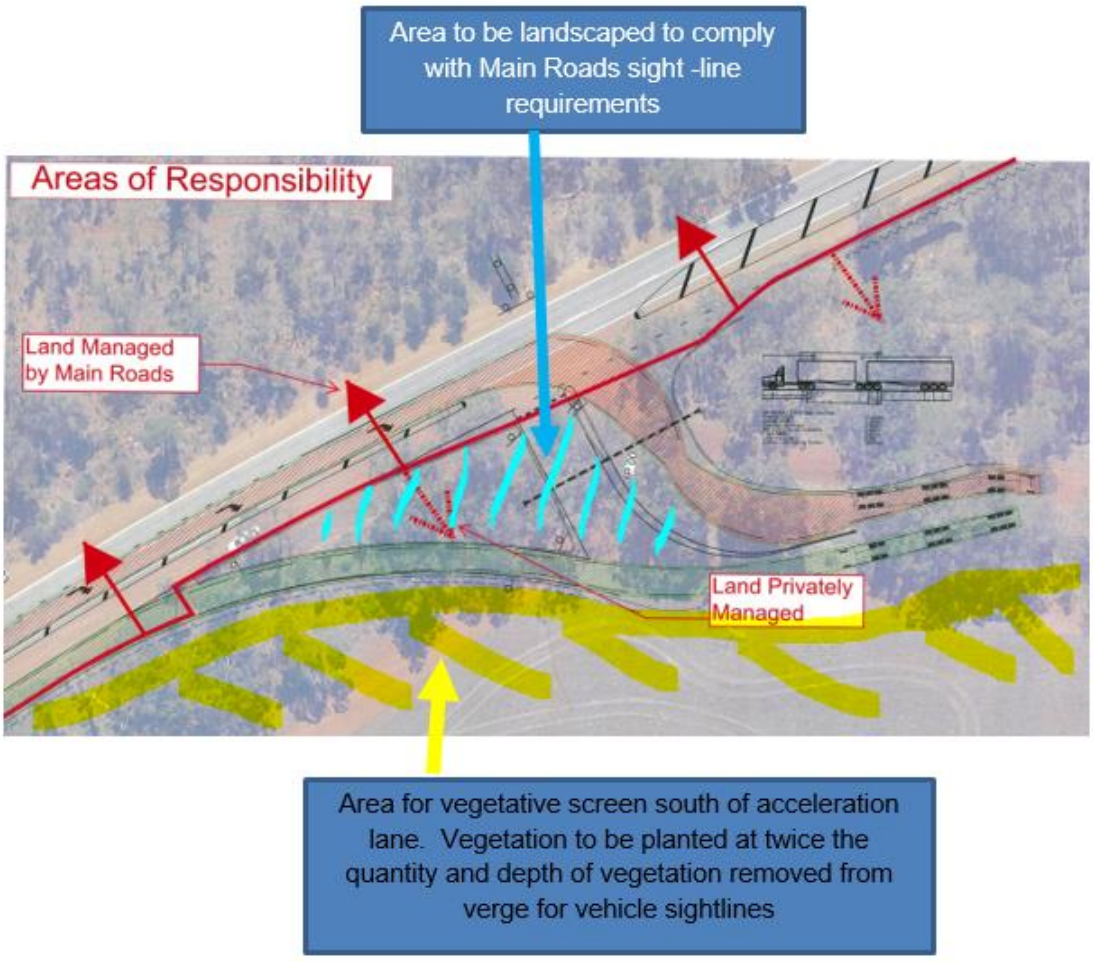
Clause 5.7.11 ‘Preservation of amenity’ of LPS 4 states:

> *“In order to avoid adverse impact on the visual amenity of an area, the Shire may impose conditions on any planning approval requiring:*
> *(a) the screening of the development by vegetation, with requirements relating to planting and/or maintenance of such vegetation …”*

To ensure visual amenity and screening of operations are maintained, it is recommended the applicant provide a vegetative screen within the boundaries of the site.

Quantity of plants for the vegetative screen should consist of 2 trees/plants for every 1 tree/plant removed for sightlines. Ideally this landscaping should occupy an area twice the depth of the area of vegetation removed from the verge (i.e. 15m depth of vegetation removed from road verge = 30m depth of vegetation screen). To ensure this vegetation screen does not impinge vehicle sightlines, the screen should be located south of the acceleration lane for vehicles turning left in a south westerly direction (as highlighted in yellow below).

Figure 11: Recommended location of vegetative screen



The pocket of vegetation located to the north of the acceleration lane will need to be managed in accordance with Main Roads requirements (blue hashed area). Although this land area will fall within the site boundaries, the site access begins to converge with Toodyay Road within this locality, and therefore may affect vehicle sightlines.

Dust management:

A comprehensive dust management plan has been prepared for and approved by DWER. Dust management requirements have been conditioned within the DWER works Approval and Licence, which the proponent must comply with.

The primary method for dust suppression is the application of water over exposed surfaces. All internal tracks shall be watered down via water carts and the access track to the site will be bituminised for a length of 100m before it connects to Toodyay Road to reduce dust emissions from trucks. All gravel product will be made wet after being loaded on trucks and covered with tarpaulins prior to haulage.

The processing plant area will be located at a depression point on site, and close to extraction areas to limit the time the gravel is carried across site and exposed to wind.

Additional dust management measures that will be implemented to provide more permanent stabilisation of surfaces will include hydro mulching and seeding for large areas that are not trafficked or disturbed, and the use of water additives which coagulate the surface of the soil, providing a bonding agent for a temporary period.

On-going monitoring of gravel tracks, access to Toodyay Road, stockpiles and activity areas for dust lift off will be undertaken, along with daily visual monitoring of weather conditions. An onsite weather station is to be setup to measure wind speed and direction to assist with dust management. Continuous dust monitoring devices will be set up along the eastern boundary adjacent to Extraction Area 1 and the western boundary adjacent to Extraction Area 2, providing automatic feedback to the manager / site supervisor. When dust controls are ineffective, works will be temporarily suspended, with the application of water to critical areas causing dust lift-off.

Noise management:

Noise pollution from the development will be generated from the operation of extractive industry equipment, which will include the processing plant (used for crushing and screening the gravel) and mobile equipment such as a bulldozer, front end loader, quarry trucks, haul trucks and a water cart. No blasting is proposed.

The hours of operation will be during daytime hours from 7:00am – 5:00pm Mondays to Saturdays, consistent with the existing approval.

An acoustic assessment has been undertaken by Herring Storer Acoustics to assess both the individual and the cumulative noise level impacts of the extraction of gravel and the processing of gravel on site to the nearest surrounding noise sensitive premises.

The acoustic report identified that the development would comply with the *Environmental Protection (Noise) Regulations 1997* for the proposed daytime operating hours, subject to the construction of a noise barrier / bund along a portion of the western boundary adjacent to Extraction Area 2. The material proposed to be used for the bund will be sourced from the overburden from Extraction Area 1 and any excess material from the development of the road and infrastructure for the site. The bund is to be constructed within a period not exceeding 6 weeks, and must be completed prior to operations commencing in Extraction Area 2.

Noise abatement requirements have been conditioned within DWER works Approval and Licence. Noise emissions from the extractive industry must comply with the *Environmental Protection (Noise) Regulations 1997* at all times.

Stormwater management

A stormwater management plan has been prepared for and approved by DWER. Stormwater management requirements are conditioned within DWER works Approval and Licence, which the proponent must comply with.

Cut off drains are to be constructed in strategic locations at the perimeter of Extraction Areas 1 and2 to intercept contaminated stormwater which may flow off the works area. The cut off drains are to be shaped from the soil to form a bund parallel to the land contours and will direct the flow of stormwater away from the Red Swamp Brook area. Sediment filtration devices and localised catchment dams are proposed to assist with the management of overland water flows.

Ongoing water quality testing of the Red Swamp Brook will also be conducted to identify any potential contamination of the watercourse. A Contamination Action Plan will be implemented in the event that unacceptable changes are identified through comparative analysis of water tests. All water quality testing must be reported back to DWER on a periodic basis during extractive operations.

Road safety / traffic management:

A Traffic Impact Assessment (TIA) (version H dated 21 May 2020) has been prepared by Shawmac civil and traffic engineers to assess the traffic impacts of the proposal on the existing road network.

The TIA identified that the additional traffic generated by the proposal will not increase the likelihood of crashes to unacceptable levels and is unlikely to severely impact the operation of school buses travelling along this portion of Toodyay Road. The TIA also indicated that the development will have minimal impact on congestion to local traffic within the area.

Based on the predicted traffic volumes when the site is operating at its maximum capacity, upgrades to the site access intersection with Toodyay Road will be required. These upgrades include a channelised right hand turn treatment and an acceleration lane to allow trucks to accelerate to 70% of operating speed before merging into existing traffic for left turns exiting the site.

To provide sufficient sight distances at the site access / Toodyay Road intersection, various upgrades to the intersection will be required and/or selected clearing of verge vegetation undertaken. A portion of the front boundary of the site will be required to be ceded to Main Roads as road reserve to ensure sufficient sightlines are provided and maintained to Main Roads requirements in perpetuity. Various traffic safety signs will be required to be installed east and west of the intersection to warn motorists of the approaching site entrance and potential trucks (i.e. road trains) entering /exiting Toodyay Road

Main Roads have reviewed the TIA and support the proposal based on the above intersection upgrades and amendments to the verge being implemented.

Heritage

There are no heritage listings on either the State Heritage Register or the Shire's Municipal Heritage Inventory.

A search of the Register of Aboriginal Sites revealed that there is one site under the *Aboriginal Heritage Act 1972*, Site ID 3536 (Swan River). This area of land refers to the Red Swamp Brook, and includes an approximate 20m wide strip of land around the watercourse.

No works are proposed within or over the Red Swamp Brook. No extractive operations will be carried out within 600m of the Red Swamp Brook watercourse.

The proponent is responsible for ensuring compliance with the *Aboriginal Heritage Act, 1972* during the course of ground disturbance activities.

Impact on local tourism:

The development is not considered to have significant impact on local tourism to the area. The site is not located adjacent to or within the vicinity of tourism sites, parkland or reserves, or other public amenities. Operating hours will be predominantly during the working week, with no work proposed on Sundays or public holidays. Truck movements on Saturdays will also be limited, with most haulage carried out during the week.

The site will be managed for dust and noise emissions throughout operations to ensure there are no off site impacts. Due to the undulating topography of the site, the surrounding vegetation, and the distance of the works area to Toodyay Road, the development will not be distinctly visible to travelling motorists within the area.

Subsequent to various intersection works and road upgrades, the Traffic Impact Assessment illustrates that Toodyay Road has the capacity to accommodate the additional heavy vehicle movements to and from the site, and the implications to local traffic will not be adverse in terms of congestion or safety.

CONCLUSION:

- The site has an existing approval to operate as an extractive industry for the annual gravel extraction of gravel up to 47,000 tonnes;
- The proposal seeks to increase annual extraction up to 950,000 tonnes to allow flexibility to meet growing market demand;
- The location, depth and total area of excavation will remain unaltered from the existing approval;
- The type of extractive operations and operating times will remain unaltered from the existing approval;
- The staged areas of excavation, rehabilitation and revegetation of the gravel pits will remain unaltered from the existing approval; and
- The increase in annual extraction will likely involve:
    - Increase in daily crushing volumes of gravel;

- Increase in daily truck movements;
- Increase in daily water use; and
- Potential increase in gravel stockpiling

The above intensification of operations and the likely impacts have been assessed at local and state government levels, which include Main Roads and the environmental regulatory agency DWER.

Planning approval has been issued by the Western Australian Planning Commission (WAPC), which incorporates Main Roads conditions of approval.

A works approval and licence has been issued by the Department of Water and Environment Regulation (DWER), which regulates industrial emissions and discharges to air, land and water.

The proponent has demonstrated through the employment of appropriate measures, the development will achieve compliance with the *Environmental Protection Act 1986*, and *Environmental Protection (Noise) Regulations 1997*. Any potential environmental impacts will be minimised and controlled to sustain environmental and community amenity.

Intersection and road upgrades will ensure compliance with Main Roads safety requirements to accommodate additional truck movements, and improve vehicle sightlines.

The proposal is consistent with the Shire's LPS4 and relevant state planning policies, to provide for the extraction of a vital basic raw material within a general agriculture land holding, to limit off site impacts and allow for the provision of gravel resource near the Perth metropolitan area close to sources of demand.

As State environmental and planning approvals have already been granted, there appear limited grounds for Council to reasonably refuse the proposal under LPS4. Approval with conditions is therefore recommended accordingly.

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION

That Council grants planning approval for the proposed gravel extractive industry at 3650 (Lot 556) Toodyay Road, Bailup, subject to the following conditions:

1. The development shall comply with the approved plans (including any amendments marked in red) unless approval is granted by the Director of Statutory Services for any minor variation made necessary by detailed design; (P)

2. The extraction of gravel shall not exceed 950,000 tonnes per annum;

3. The hours of operation shall be limited to 7:00am to 5:00pm Mondays to Saturdays. No work shall be carried out on Sundays or Public Holidays;

4. Stormwater shall be diverted away from the Red Swamp Brook and Toodyay Road reserve at all times;

5. Excavation at Extraction Area 1 shall be carried out in accordance with the 'Staging Plan (Area 1)' dated 17 August 2016, and shall not exceed three (3) hectares in area at any time;

6. Rehabilitation and revegetation of the site shall be in accordance with 'Annexure 2 – Master Management Plan; Section 4 - Rehabilitation & Revegetation Management Plan' dated 10 September 2010. Rehabilitation and revegetation of each stage of excavation shall occur within 60 days upon cessation of that stage, and completed prior to the commencement of excavation of subsequent areas;

7. Prior to the commencement of operations at Extraction Area 2, a detailed staging plan for Extraction Area 2 shall be submitted and approved to the satisfaction of the Shire of Mundaring;

8. Prior to the commencement of operations at Extraction Area 2, detailed plans for the acoustic barrier / noise bund along the western boundary of Extraction Area 2 shall be submitted to and approved by the Shire of Mundaring, on advice from the Department of Water and Environment Regulation (DWER). The plans shall detail the method of construction, proposed dimensions, gradients, setbacks, dust suppression methods and landscaping of the acoustic barrier;

9. No development shall occur within 20 metres of any lot boundaries, with the exception of vehicular access to the site, and works associated with rehabilitation and revegetation;

10. No blasting shall be conducted without prior approval of the Shire of Mundaring;

11. A Dieback Management Plan shall be submitted to the satisfaction of the Shire of Mundaring, within three (3) months of the date of this approval. The plan shall identify appropriate management practices for preventing the spread of Phytophthora dieback, ensuring all machinery, particularly earth moving equipment is clean (i.e. free of soil and vegetative materials) on entry and exit of the site;

12. The proposed access is not to be gated within 100m of Toodyay Road Reserve;

13. Sight lines must be maintained at all times to ensure driver safety and may require further earth works and vegetation removal;

14. A landscaping plan for a vegetative screen within the site and adjacent to the Toodyay Road site intersection upgrades, shall be submitted to the satisfaction of the Shire of Mundaring within three (3) months of the date of this approval. The landscaping plan shall detail planting to the south of the proposed acceleration lane, at a minimum depth of 30 metres, to a ratio of 1:2 (removed : replaced). The vegetative screen shall thereafter be established and maintained in accordance with the approved landscaping plan within 12 months of the date of this approval;

15. A landscaping plan for the revegetation of Red Swamp Brook, shall be submitted to the satisfaction of the Shire of Mundaring within three (3) months of the date of this approval. The landscaping plan shall detail all native vegetation to be retained; weed management to be undertaken; and additional planting of riparian vegetation (including numbers and species). The approved landscaping plan shall be implemented within 12 months of the date of this approval;

16. No works associated with the alteration to the size of any other watercourses (including dams or soaks) are permitted without the prior approval of the Shire of Mundaring;

17. The stockpiling of gravel product shall be limited to a maximum height of eight (8) metres;

18. The stockpiling of topsoil and overburden shall be limited to a maximum height of four (4) metres;

19. The applicant shall apply for an Extractive Industry Licence in accordance with the requirements of the Shire's Extractive Industry Local Law, within eight (8) months of the date of this approval; or when the annual extraction of gravel is expected to exceed 47,000 tonnes, whichever occurs first. The Extractive Industry Licence shall be in accordance with the conditions and plans of this approval, for the annual extraction of gravel up to 950,000 tonnes; and

20. A bond shall be taken by the Shire for site revegetation and remediation works in accordance with the requirements of the Extractive Industry Local Law.

ADVICE NOTES:

1. In relation to Condition No. 1, the approval relates to the following plans:

    - Proposed Extractive Industry Operation – Site Plan;
    - Proposed Extractive Industry Operation – Revegetation Plan;
    - Bailup Proposed Extractive Industry – Revegetation Diagram 1&2;
    - Concept Design Drawing (Main Roads intersection design);
    - Extractive Industry Operation Staging Plan (Extraction Area 1); and
    - Areas of Responsibility (Land Managed by Main Roads / Land Privately Managed)

    The approval also relates to the following document:

    "Extractive Industry Application report" (20 October 2009); which includes the Master Management Plan (10 September 2010), Construction Noise Management Plan (November 2016), Dust Management Plan (August 2016), Staging Plan - Extractive Area 1 (17 August 2016), and Stormwater Management Plan (10 August 2016);

2. All landscaping and revegetation of the site shall be undertaken using local endemic plant species only;

3. In relation to Condition No. 8, the acoustic barrier shall ensure that noise at the nearest sensitive receptors to Extraction Area 2 does not exceed the noise assigned levels as per the *Environmental Protection (Noise) Regulations* 1997. No excavation shall occur within Extraction Area 2 until the approved acoustic barrier has been constructed. Construction of the noise bund shall be completed within a 6 week timeframe consistent with the requirements of the DWER Licence. If constructed of earth, material for the noise bund shall not be sourced from topsoil or excavated material from Extraction Area 2;

4. The Shire notes WAPC's approval under the MRS requires the following to occur:

   6. Prior to the commencement of the development, the applicant/landowner shall design and construct at its own cost the Toodyay Road and access point modifications generally in accordance with the concept drawings (see attached) and Main Roads requirements to the satisfaction of the Western Australian Planning Commission.

   7. Prior to the commencement of the development the applicant is to provide an updated Land Protection Plan identifying the additional area of land required to undertake the works in accordance with Main Roads requirements to the satisfaction of the Western Australian Planning Commission.

   8. Prior to the commencement of development, the land required for the widening of Toodyay Road as shown on the plan as per condition 7, must be set aside as a separate lot and is to be ceded to Main Roads free of cost to the satisfaction of the Western Australian Planning Commission.

   9. Prior to the commencement of the development the access road shall be sealed between edge of the Toodyay Road sealed surface and 100m into the property in accordance with local government and Main Roads requirements to the satisfaction of the Western Australian Planning Commission.

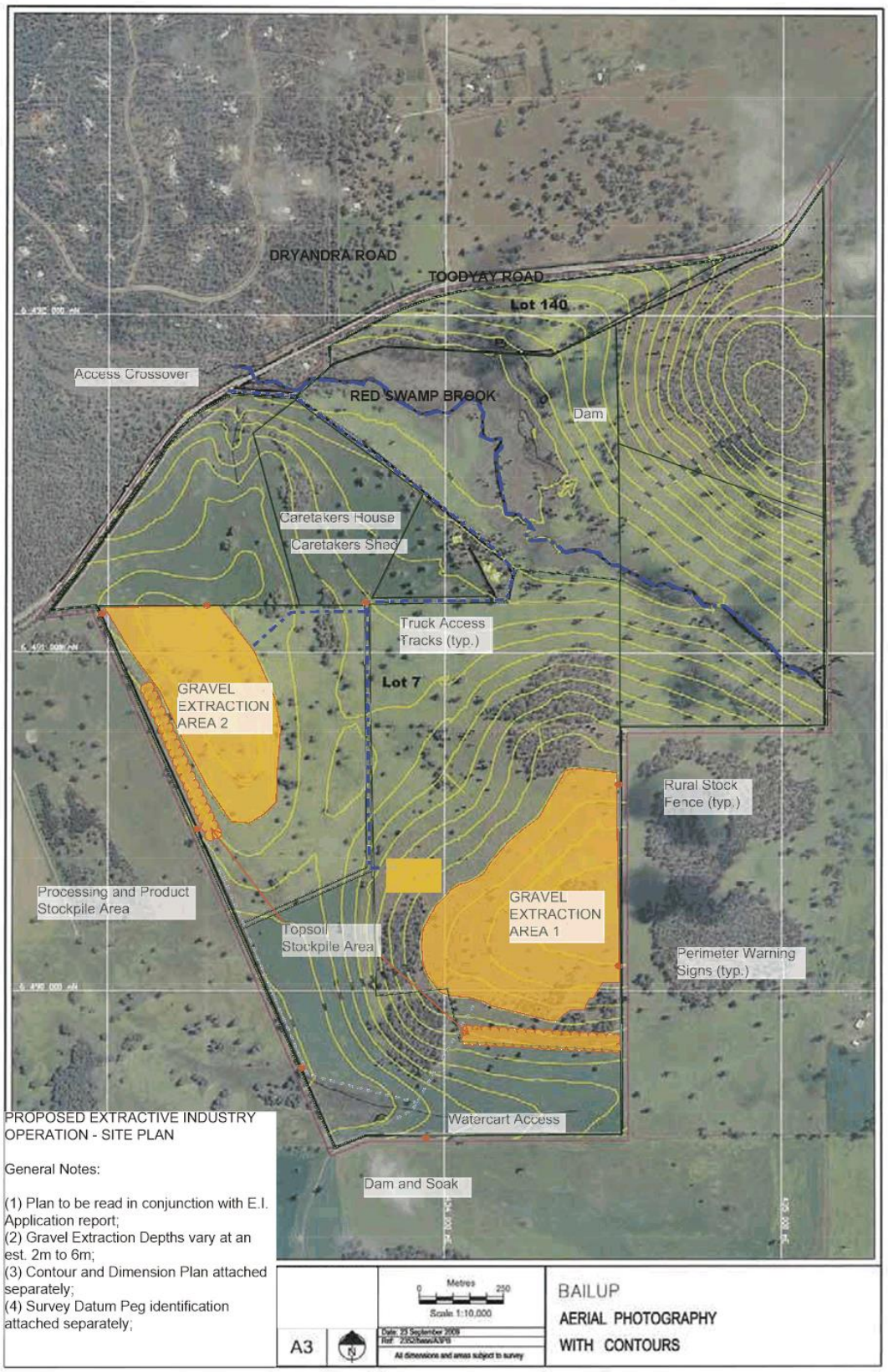
   10. Prior to the commencement of development, the applicant is to enter into an agreement with Main Roads that addresses the areas of responsibility in terms of maintenance in accordance with Main Roads requirements to the satisfaction of the Western Australian Planning Commission.

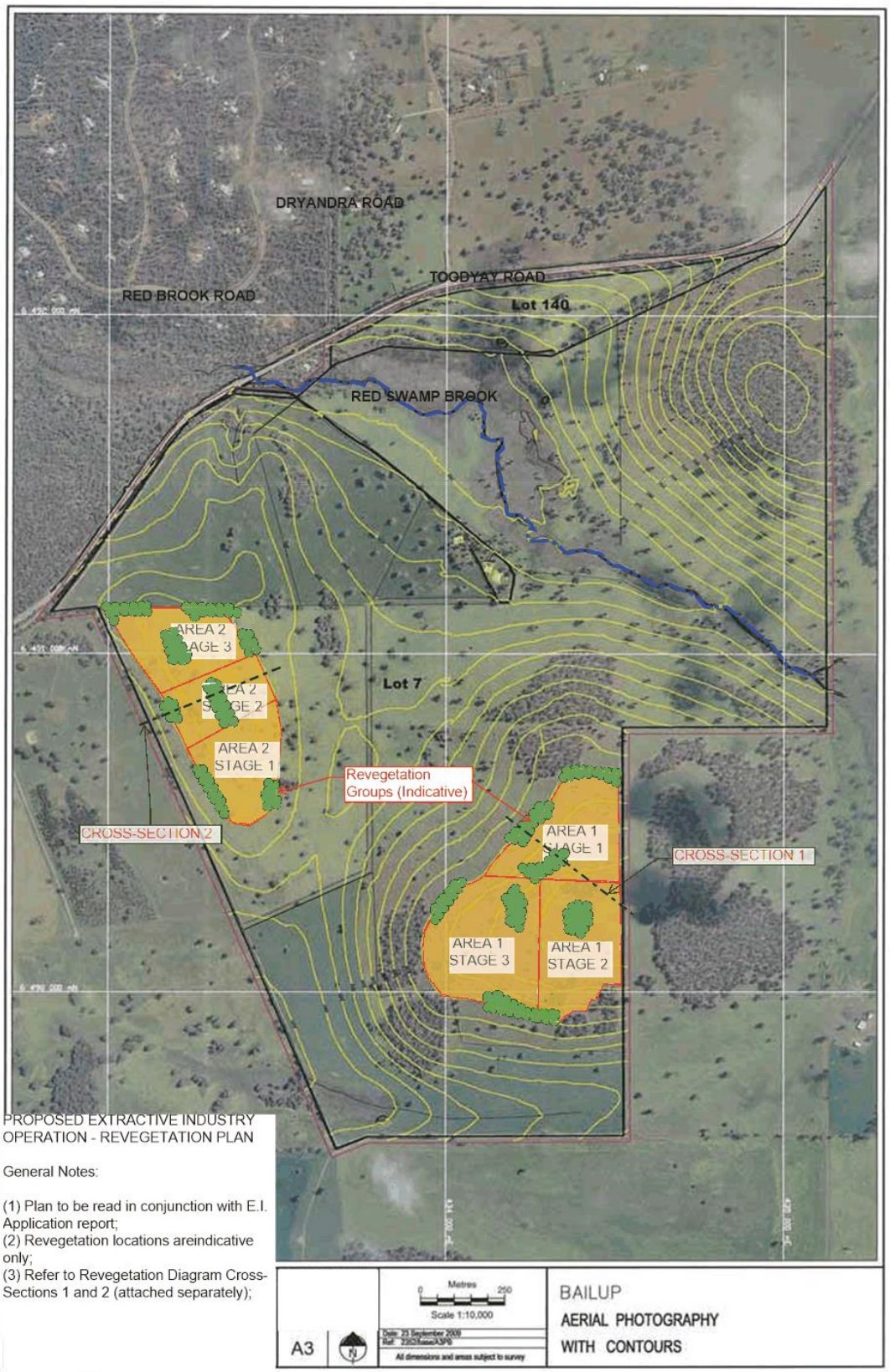
5. The development may require significant earthworks within the road reserve due to the topography, including the clearing of native vegetation. This will require further third party environmental approvals to ensure such clearing can occur;

6. The applicant is required to submit an application form to undertake works within the road reserve prior to undertaking any works within the road reserve. Application forms and supporting information about the procedure can be found on the Main Roads website ‘Technical & Commercial- Working on Roads’;

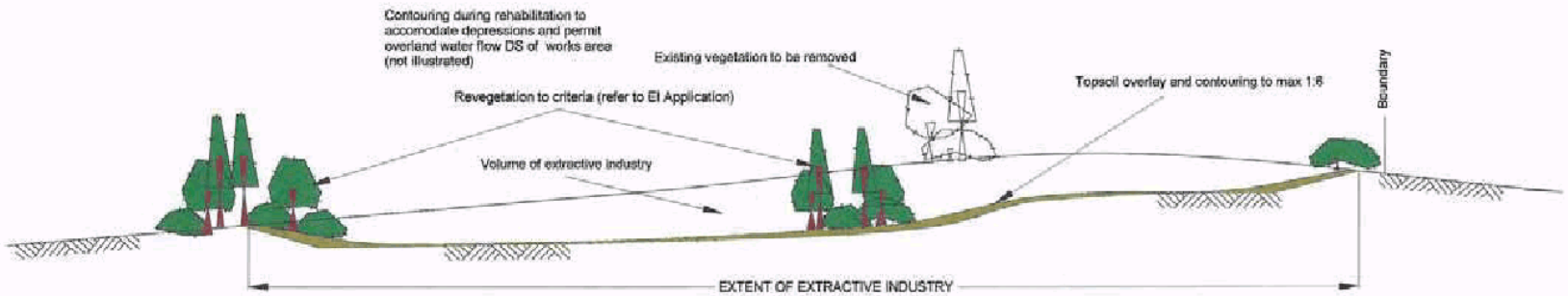
7. Further Restricted Access Vehicle (RAV) access approvals may be required from Main Roads Heavy Vehicle Services; and

8. Stormwater management is to be in accordance with the *Stormwater Management Manual of Western Australia (DoW, 2004-2007).*


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
Access Crossover
RED SWAMP BROOK
Dam
Caretakers House
Caretakers Shed
Truck Access Tracks (typ.)
Lot 7
GRAVEL EXTRACTION AREA 2
Rural Stock Fence (typ.)
Processing and Product Stockpile Area
Topsoil Stockpile Area
GRAVEL EXTRACTION AREA 1
Perimeter Warning Signs (typ.)
Watercart Access
Dam and Soak
PROPOSED EXTRACTIVE INDUSTRY OPERATION - SITE PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Gravel Extraction Depths vary at an est. 2m to 6m;
(3) Contour and Dimension Plan attached separately;
(4) Survey Datum Peg identification attached separately;
Metres
0
250
Scale 1:10,000
A3
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS

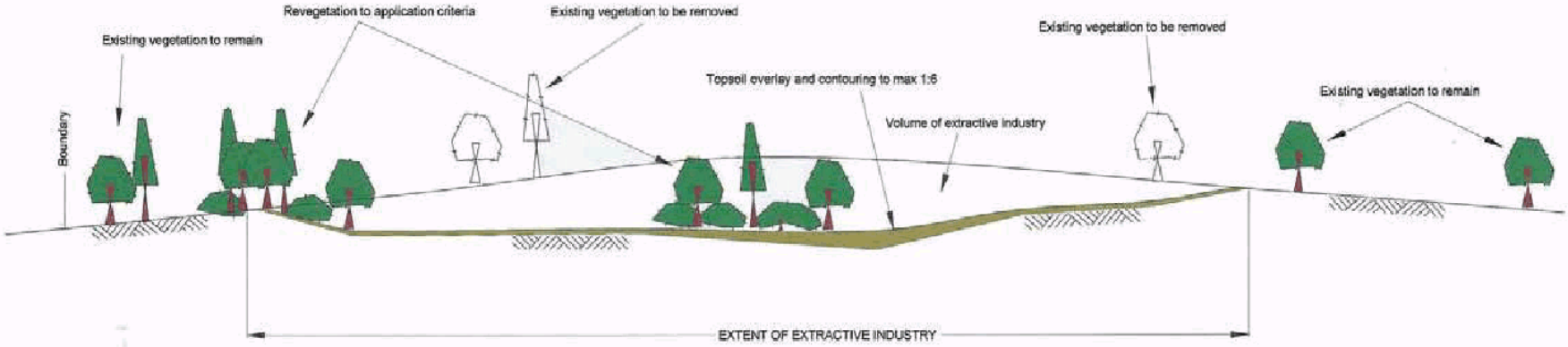

DRYANDRA ROAD
TOODYAY ROAD
RED BROOK ROAD
Lot 140
RED SWAMP BROOK
Lot 7
AREA 2 STAGE 3
AREA 2 STAGE 2
AREA 2 STAGE 1
Revegetation Groups (Indicative)
CROSS-SECTION 2
AREA 1 STAGE 1
CROSS-SECTION 1
AREA 1 STAGE 3
AREA 1 STAGE 2
PROPOSED EXTRACTIVE INDUSTRY OPERATION - REVEGETATION PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Revegetation locations areindicative only;
(3) Refer to Revegetation Diagram Cross-Sections 1 and 2 (attached separately);
Metres
Scale 1:10,000
A3
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS

BAILUP PROPOSED EXTRACTIVE INDUSTRY - REVEGETATION DIAGRAM 1 & 2

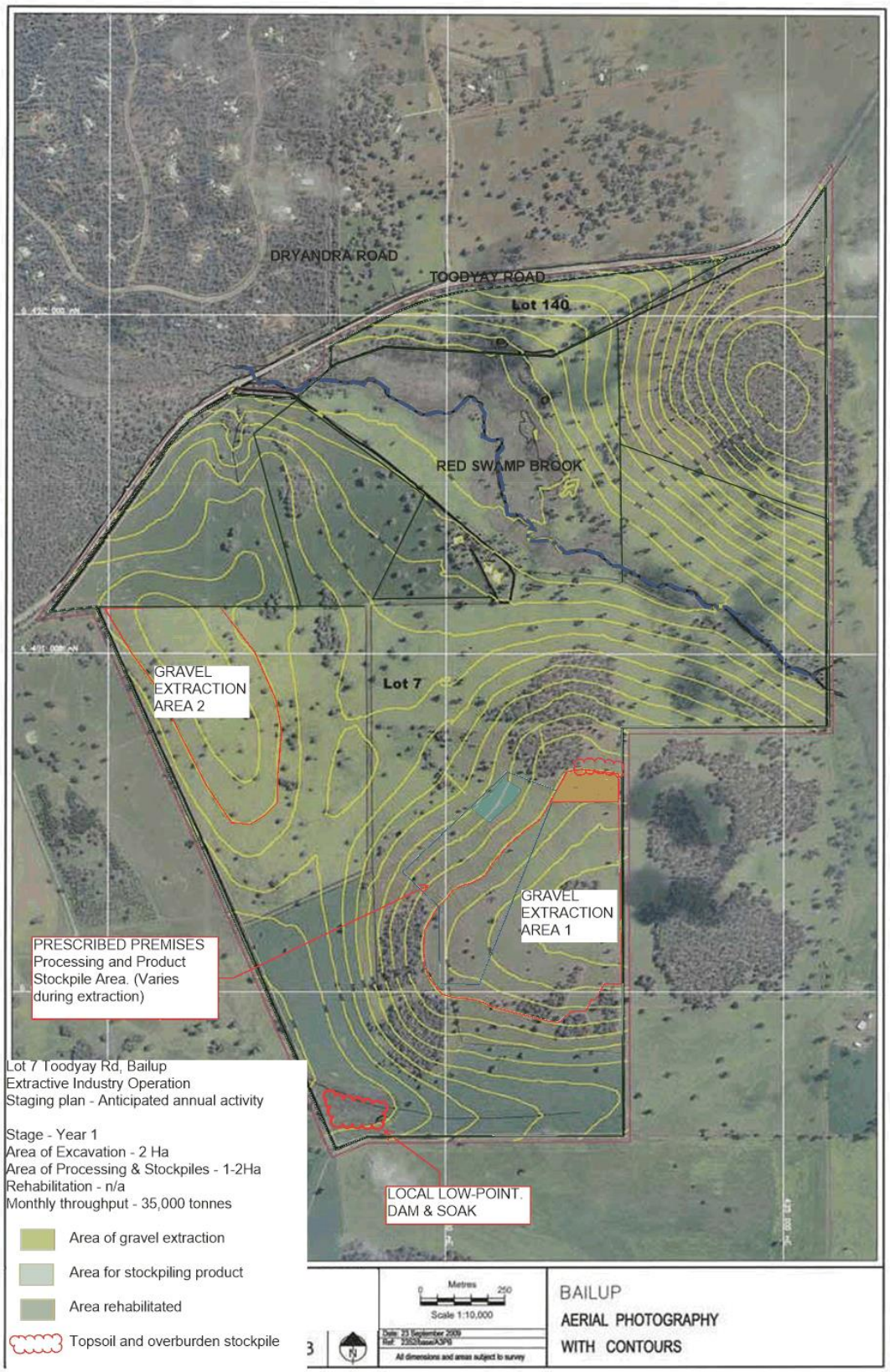


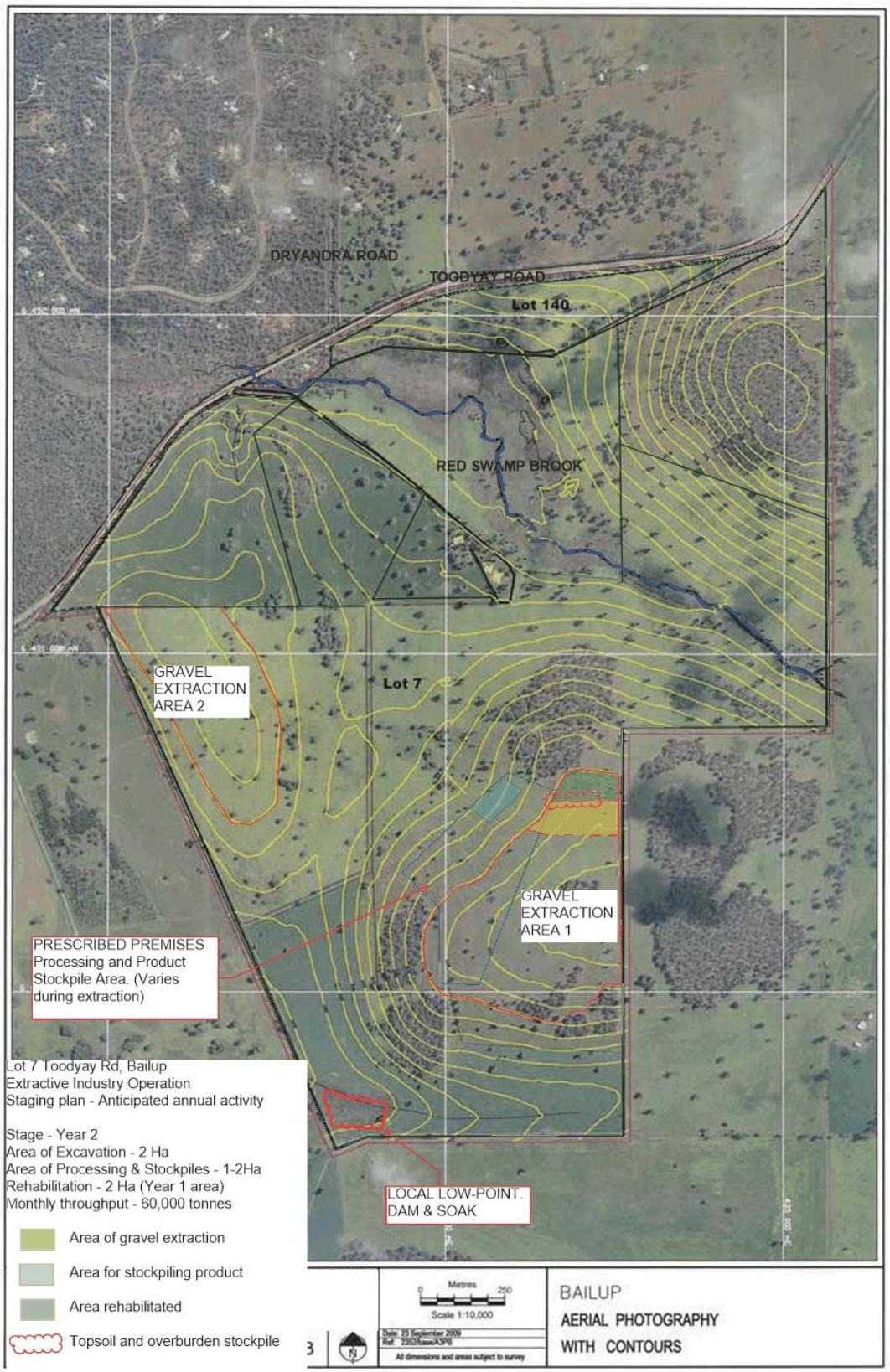
DIAGRAMATIC CROSS-SECTION THROUGH EXTRACTION AREA 1

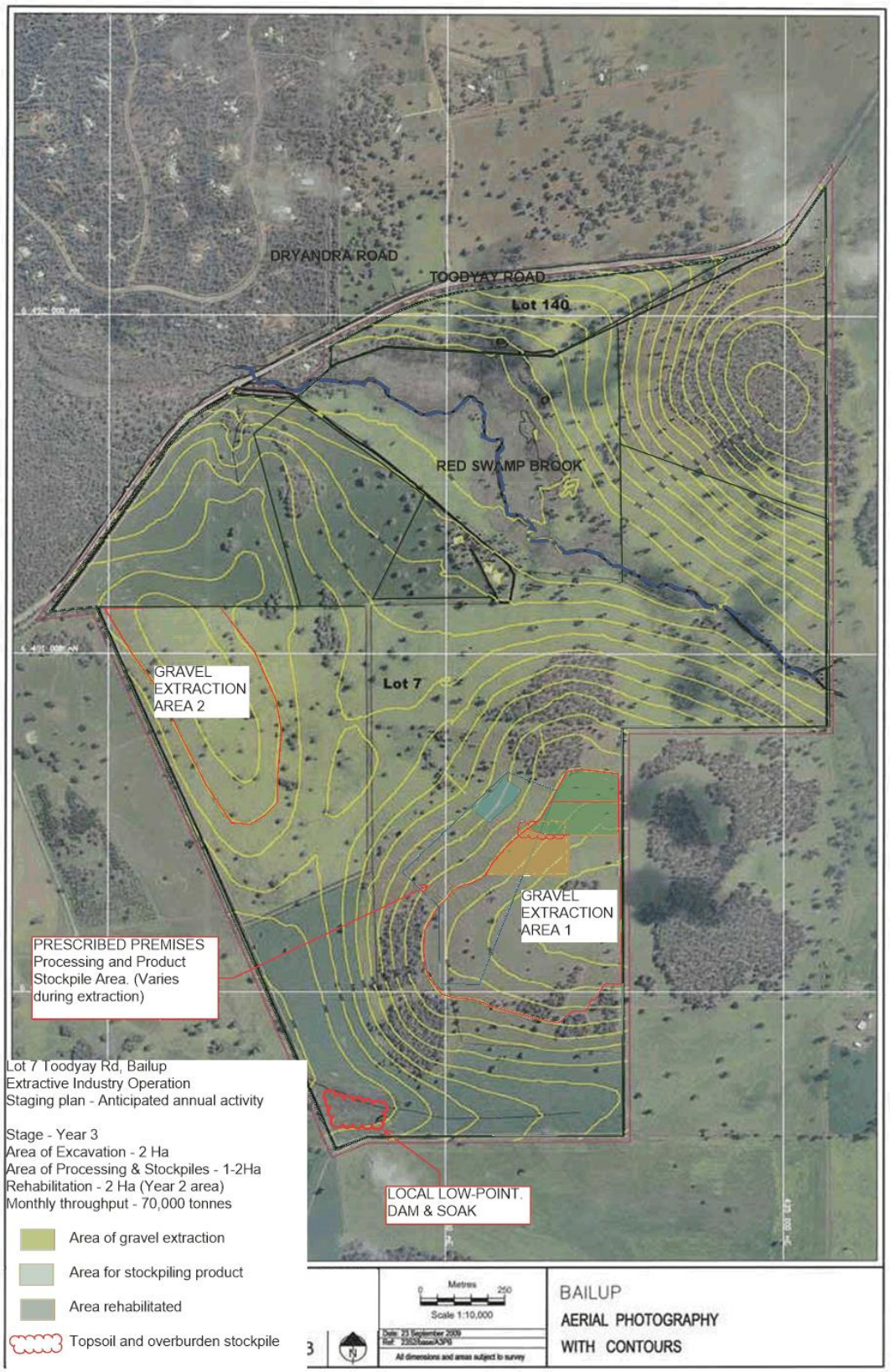
General Note - Contouring during rehabilitation to accomodate depressions and permit overland water flow DS of works area (not illustrated)

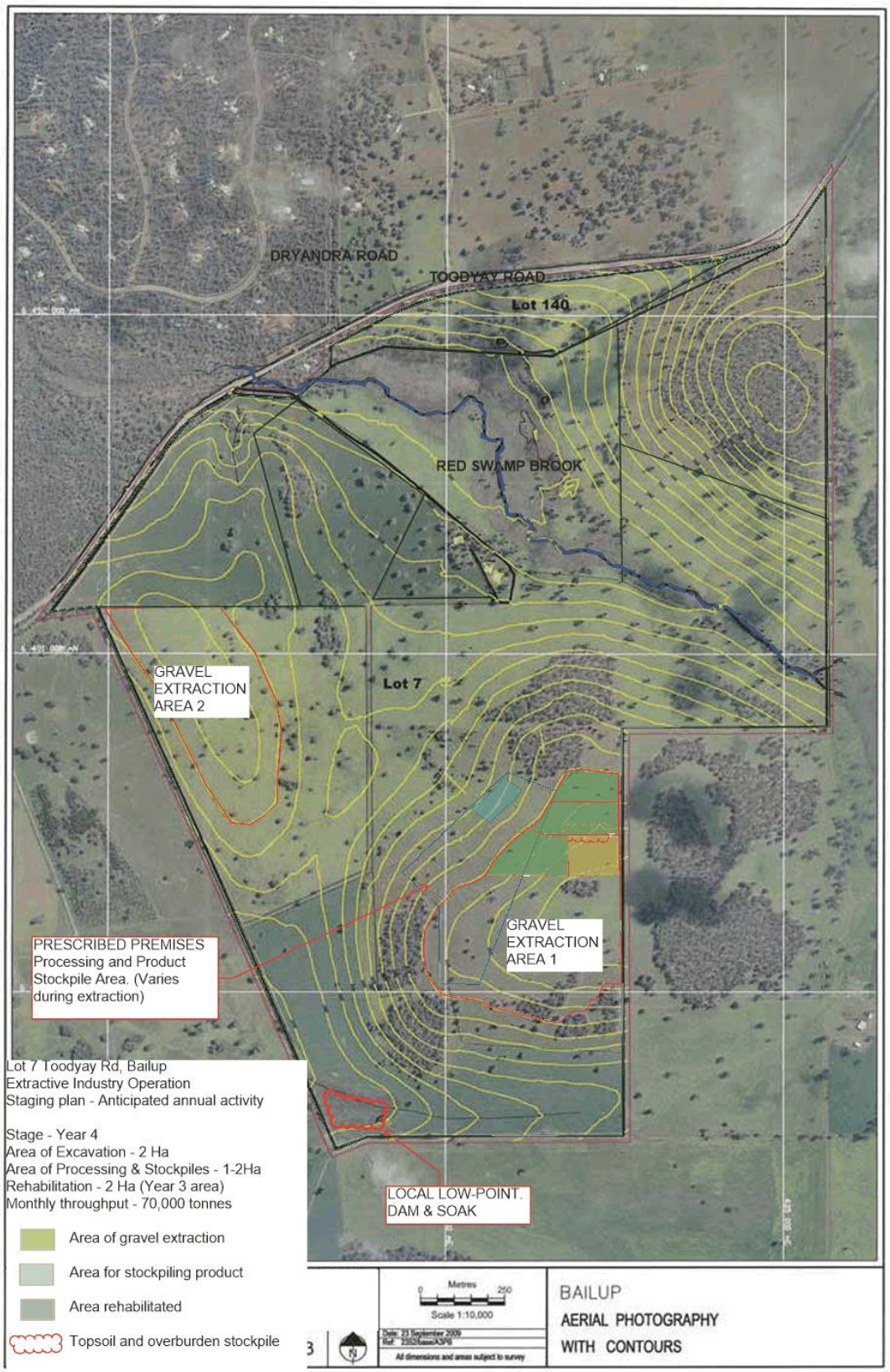


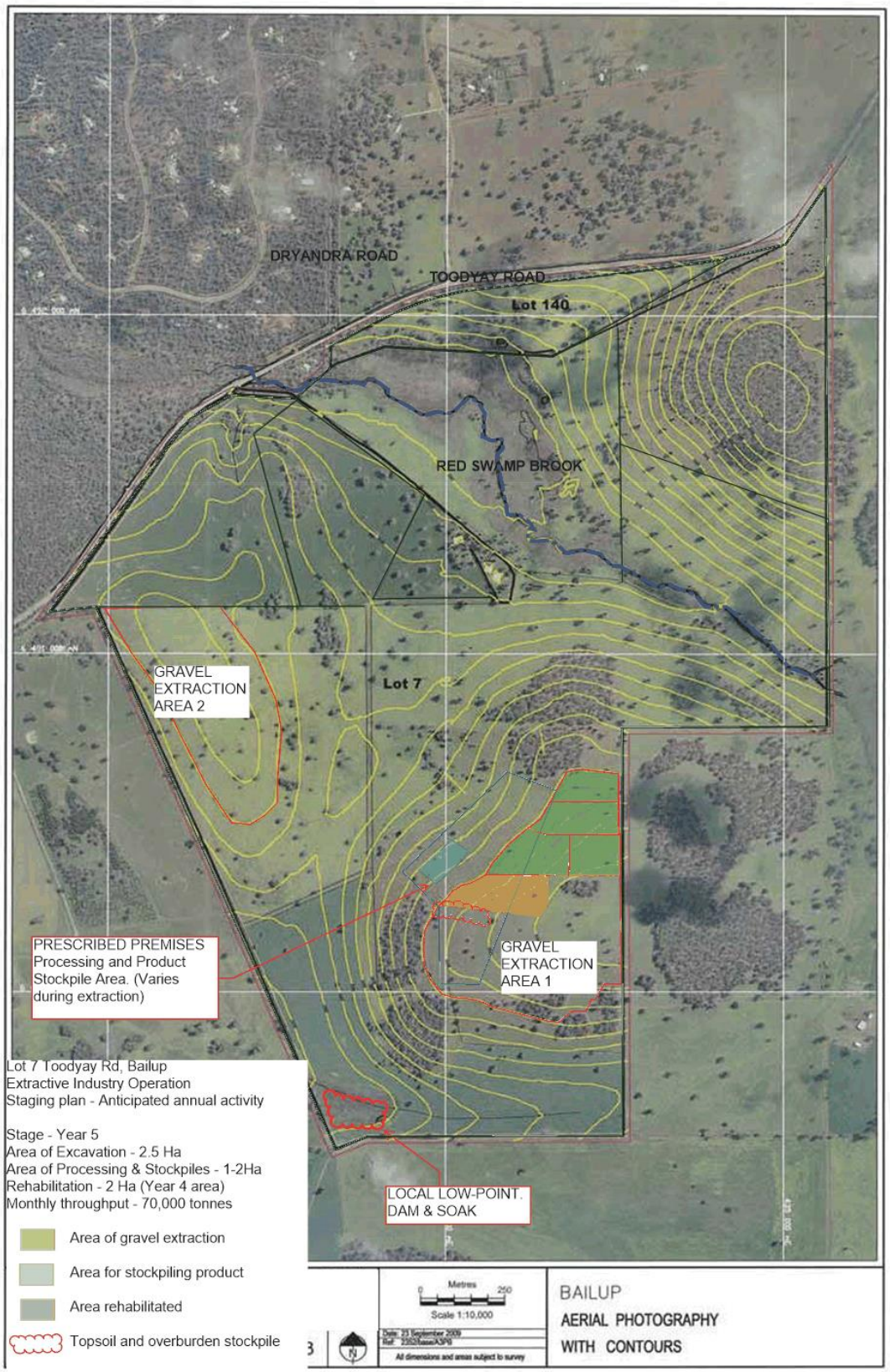
DIAGRAMATIC CROSS-SECTION THROUGH EXTRACTION AREA 2


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 1
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - n/a
Monthly throughput - 35,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 2
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 1 area)
Monthly throughput - 60,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 3
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 2 area)
Monthly throughput - 70,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 4
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 3 area)
Monthly throughput - 70,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
GRAVEL EXTRACTION AREA 1
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 5
Area of Excavation - 2.5 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 4 area)
Monthly throughput - 70,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
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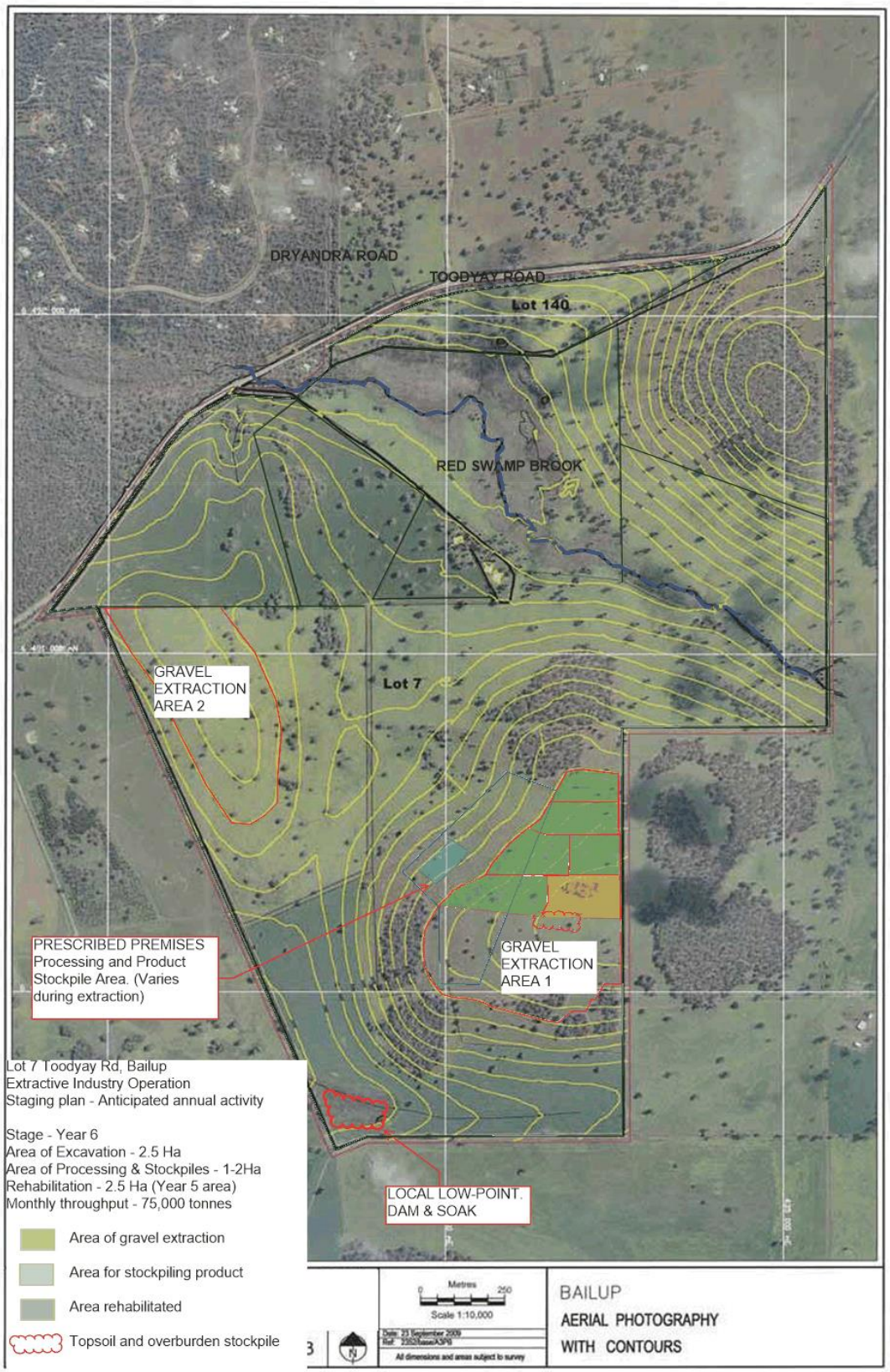
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TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 6
Area of Excavation - 2.5 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2.5 Ha (Year 5 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
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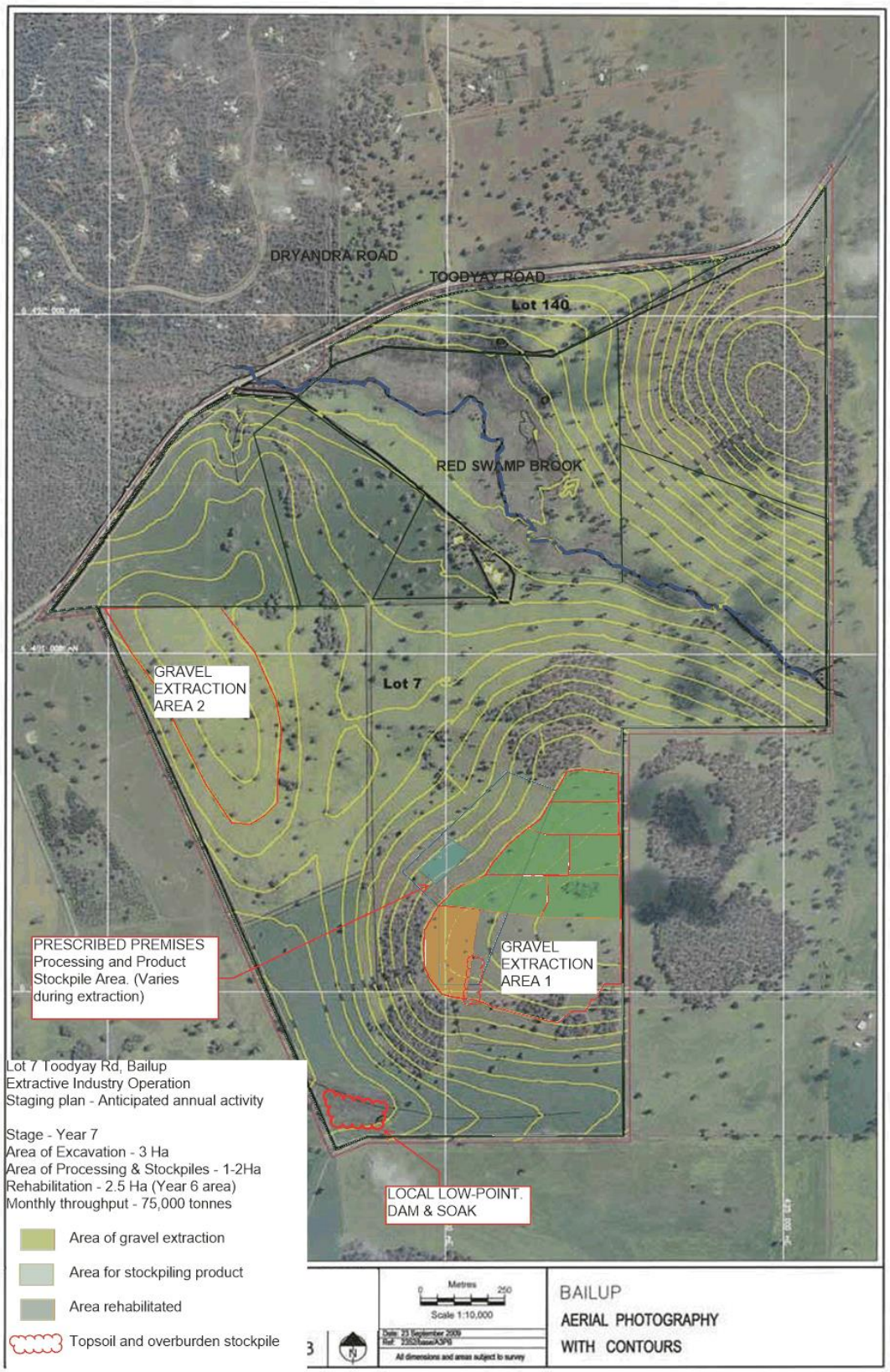
WITH CONTOURS


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
GRAVEL EXTRACTION AREA 1
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 7
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2.5 Ha (Year 6 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
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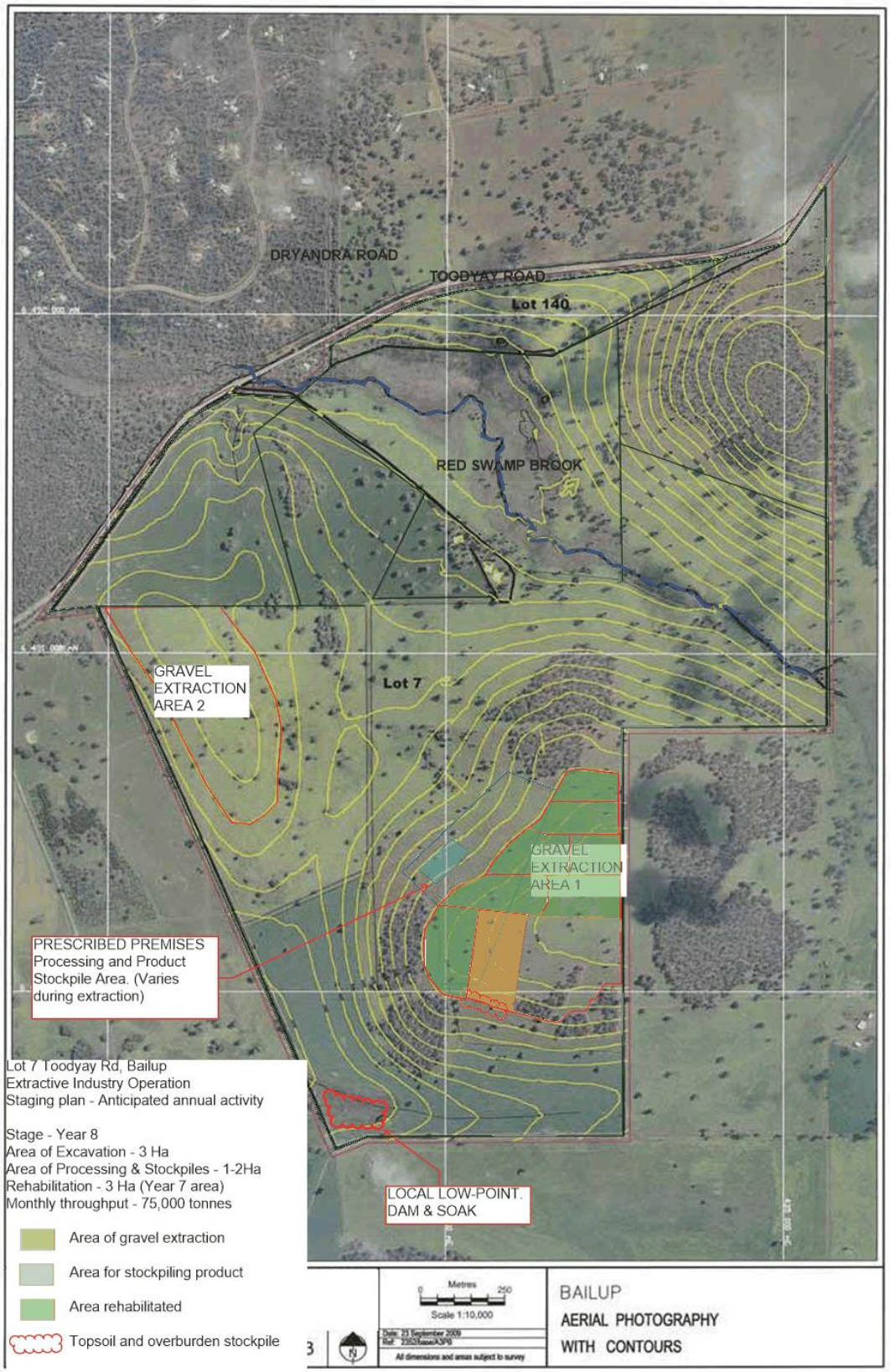
WITH CONTOURS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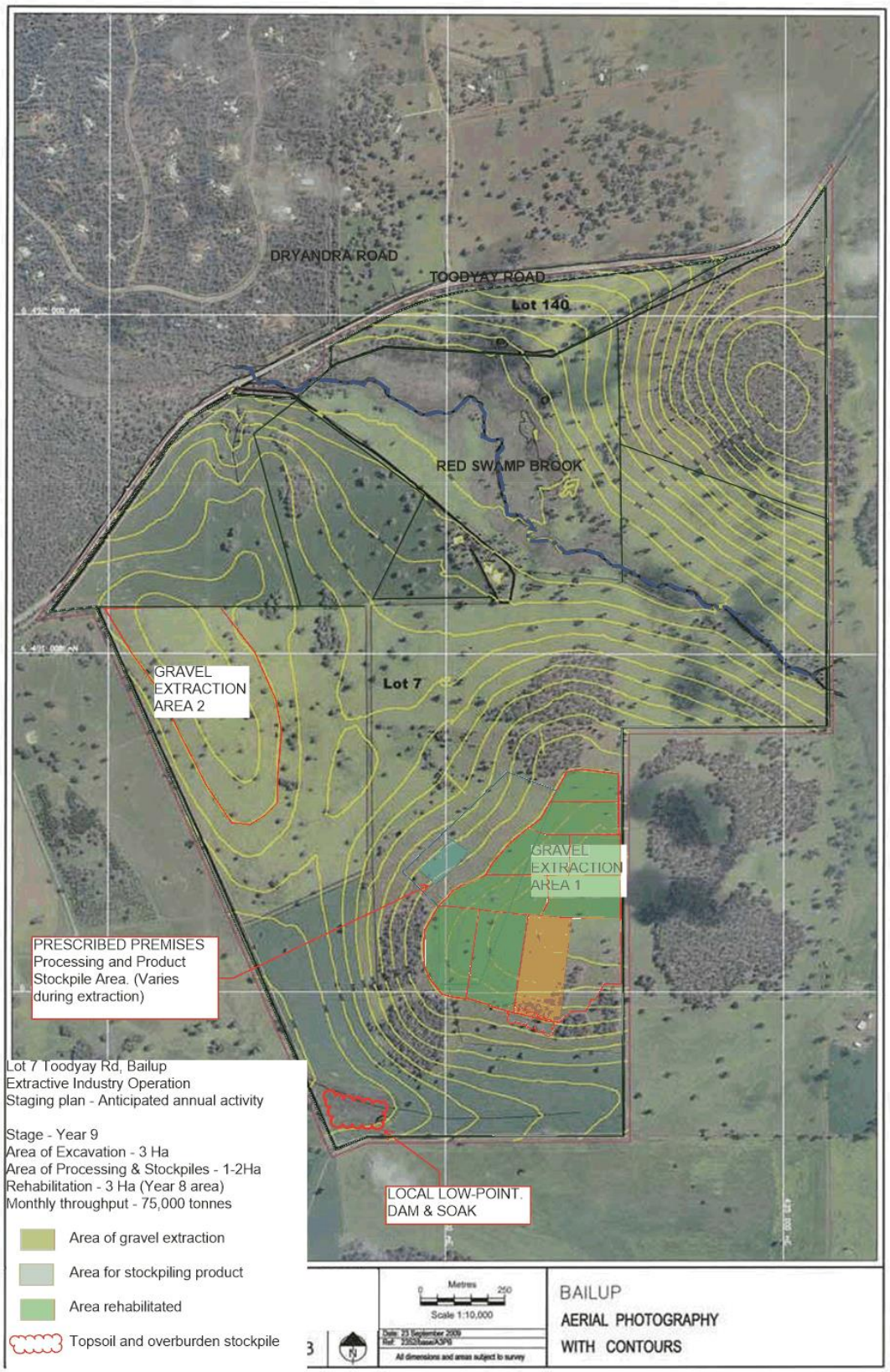
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 8
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 3 Ha (Year 7 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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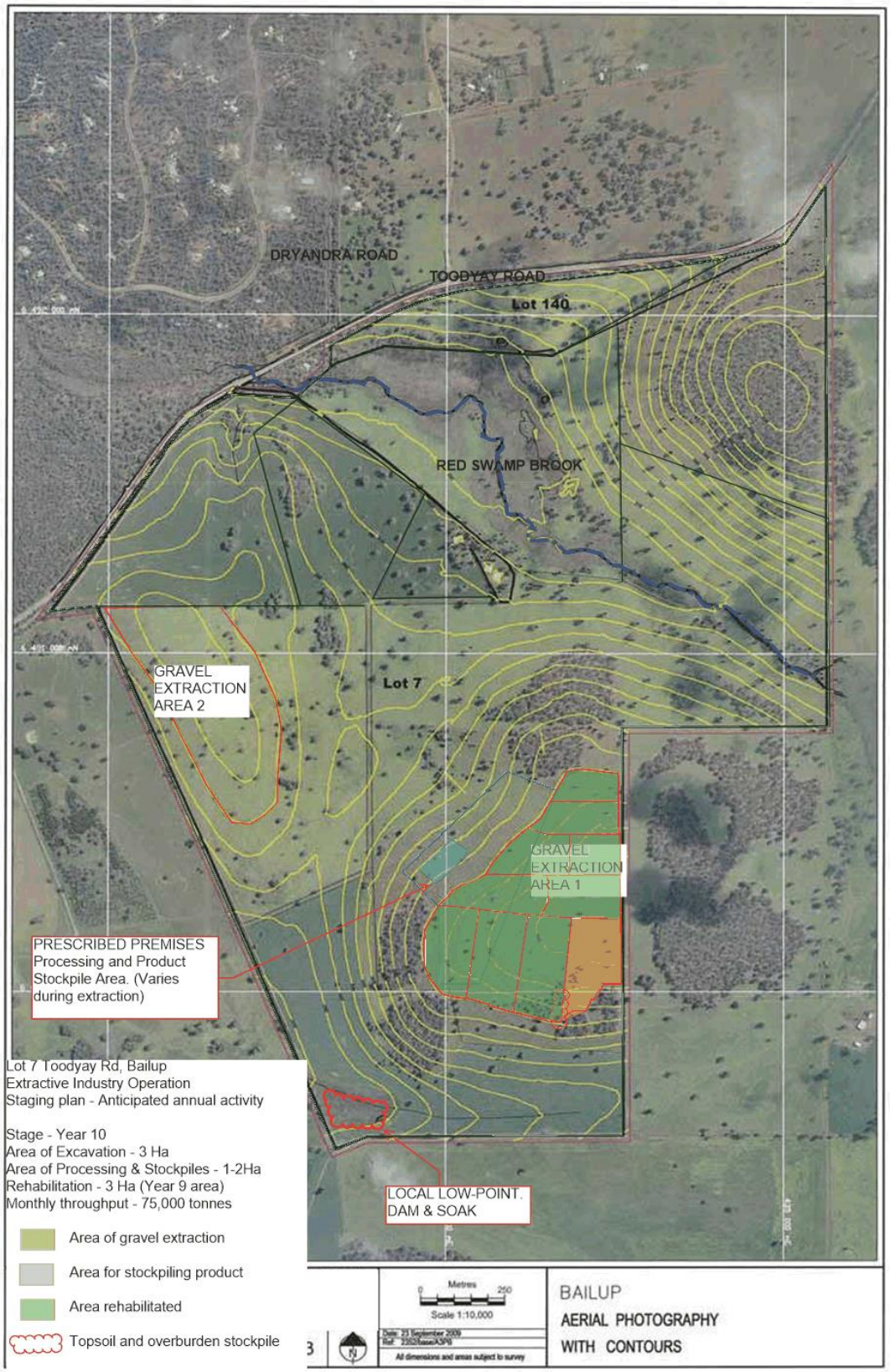
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 9
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 3 Ha (Year 8 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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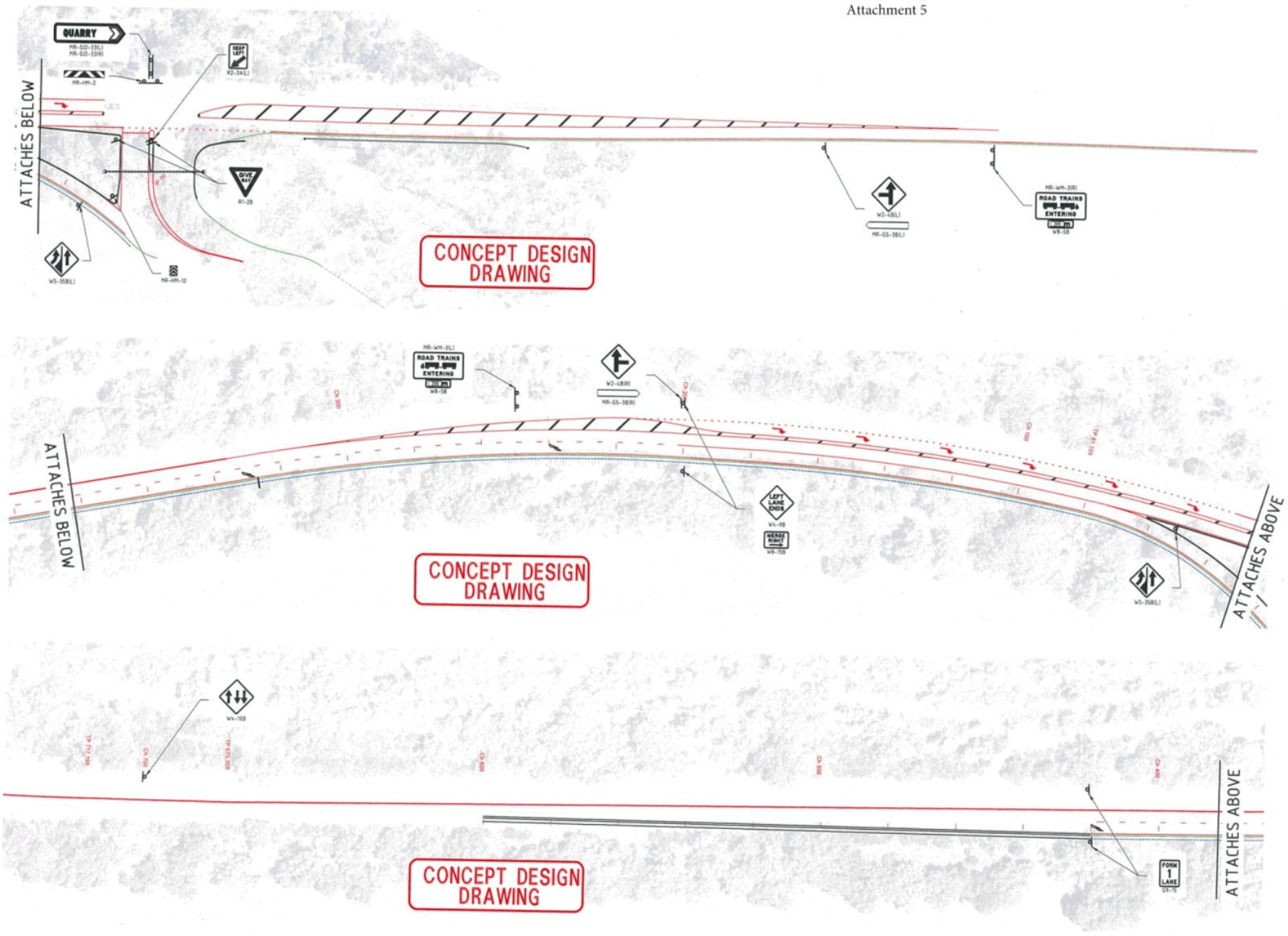
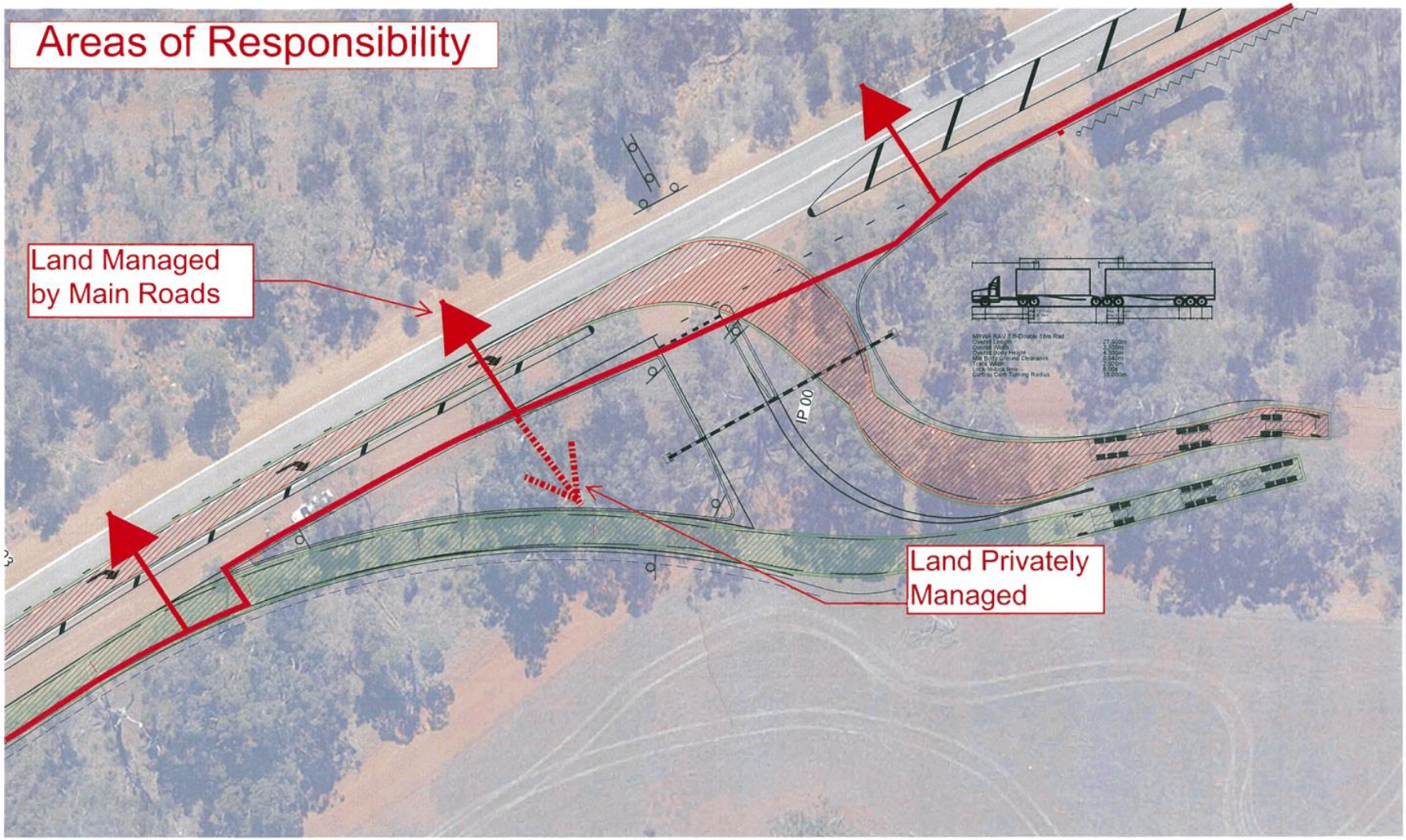
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 10
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 3 Ha (Year 9 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


Attachment 5
QUARRY
ATTACHES BELOW
CONCEPT DESIGN DRAWING
ROAD TRAINS ENTERING
ATTACHES BELOW
CONCEPT DESIGN DRAWING
ATTACHES ABOVE
CONCEPT DESIGN DRAWING
ATTACHES ABOVE


Areas of Responsibility
Land Managed by Main Roads
Land Privately Managed
IP 00

Extractive Industry Application

for

GREENWAVE NOMINEES

at

Lot 7 Toodyay Road, Bailup

20 October 2009

Prepared by:
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Oakford, WA 6121

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Email: ben.avila@iinet.net.au

Executive Summary

This application to develop an extractive industry on Lot 7 Toodyay Road, Bailup, is made on behalf of Corio Sands Pty Ltd ("the proponent") with consent of the property owner Elswick Developments Pty Ltd.

Lots 7 ("the site") consists of 375 hectares of rural land currently used for agricultural purposes (cropping and grazing). Other surrounding land uses are predominantly rural-agricultural in nature.

Gravel resource has been identified on the site, predominantly in areas unsuitable for growing crops for harvesting or grazing. In order for gravel extraction to take place, a development approval and extractive industry licence is required from the Shire of Mundaring.

Sole road access is provided via Toodyay Road. It is proposed that the proponent works in conjunction with the Shire of Mundaring for the maintenance of Toodyay Road while the gravel pit is in operation.

It is anticipated the pit would operate all year, Monday to Friday from 6am to 5pm each day. Vehicle movement would start and end an hour either side of operating times. A limited amount of site activity and maintenance work may also occur on Saturdays.

Potential dust nuisance will be managed by appropriate use of tarpaulins covering trucks leaving the site and application of water over access roads and operating areas within the site. The proposed area of works is already well protected by undulating landform and dense clumps of trees.

Public access to the site will be restricted and appropriate warning signs will be placed at the entrance to the site regarding quarrying, safety and restricted entrance. At the request of the Shire or road authority, 'truck-entering' advanced warning signs will be erected on Toodyay Road at appropriate locations.

The gravel extraction process in not envisioned to involve blasting or excessive noise-generating practices. Operation of earthmoving, processing plant and movement of trucks will be part of normal operation noise, which is generally greater than 1km from the nearest residential dwelling.

An excavation licence is sought for a twenty year period, with the option to extend after this time.

Following the completion of staged extractive industry, progressive rehabilitation and revegetation will occur to hasten establishment of fauna and flora to disturbed areas.

Table of Contents

1 INTRODUCTION

1.1 BACKGROUND

With the consent of the landowner Elswick Developments Pty Ltd (refer Appendix A), Corio Sand Pty Ltd is the proponent for an extractive industry licence on and over lot 7 (house number 3650) Toodyay Road, Bailup (termed "the site"). The licence proponent is also the proposed operator of the extraction industry.

In order to extract gravel from the site, a development approval and extractive industry licence is required from the Shire of Mundaring.

1.2 PURPOSE OF REPORT

The purpose of this report is to accompany and satisfy application requirements to the Shire of Mundaring for an extraction industry licence/development application on the site. The requirements of the Shire of Mundaring extractive industry local law are addressed within this document.

1.3 SITE DESCRIPTION

The site comprises of Lot 7 which is 375.4623 hectares of rural land.

The majority of the site has been historically cleared for general farm use. Some large clusters of natural vegetation, in the form of trees and shrubs, are found in various locations. Other isolated trees are located sporadically elsewhere.

The topography is generally gentle with relativity flat to moderate grades which elevate the land from approximately RL 265 AHD to RL 338 AHD. The land form rises in the south, west and east and is divided by Red Swamp Brook running southeast to northwest through the northern central portion of the property. The site is not considered at risk of flooding. Red Swamp Brook is recognised as a constrained area and this feature is therefore protectedg in this development application.

The site is boarded to the north by Toodyay Road for approximately 2.8 kilometres. Toodyay Road is the primary road access for the site. Lot 140, which borders most of the northern boundary is also owned by the same entity as Lot 7. A dwelling is located central north in the valley where Red Swamp Brook runs north under Toodyay Road.

The site neighbours other large, undeveloped, rural landholdings to its west, east and south which have been predominantly cleared for rural use.

The site has been soil mapped and is generally described as being in the Wundowie Soil System which is recognized in the Avon Sub Regional Strategy as having a low capability for agricultural use [refer to Appendix B Soil Map]. Specific locations of gravel extraction

undertaken with the granting of an Extractive Industry Licence are restricted to those areas of cleared land comprising of suitable gravel soils [refer to Appendix B Feature Map].

1.4 PLANNING FRAMEWORK

The site is zoned *General Rural* under the Shire of Mundaring Town Planning Scheme (TPS) No 3.

The *zone table* in the TPS indicates the extractive industries on land zoned General Rural is "not permitted unless special permission is granted by the Council." Therefore planning consent is required from Council before those uses can commence on the site

Further, provision is to be made to satisfy the *Local Government Act 1995 Shire of Mundaring Extractive Industries Local Law.* This includes the proponents applying for an Extractive Industry Licence though meeting the requirements prescribed in this Shire of Mundaring publication.

This document seeks to meet the criteria to permit the Shire of Mundaring to grant a Development Approval for Extractive Industry on the site and an Extractive Industry Licence to the proponents [application forms are provided at Appendix D].

2 WORKS AND EXCAVATION PROGRAM

2.1 BACKGROUND

This section of the document describes the works and excavation program associated with this proposal. It addresses the requirements of the Shire of Mundaring local laws under appropriate sub-headings.

The information in this section should be read in conjunction with the Feature Plan found at Appendix B.

2.2 NATURE OF WORKS AND ESTIMATED DURATION

Broad soil mapping and site investigation have indicated that good quality gravel resources are available. However, economic conditions will dictate the scale of extractive industry without excavating over-enthusiastically. It is therefore intended to apply for the maximum length licence permitted under the local law, this being for twenty years. Should the resource life extend beyond this time, a subsequent application can be made closer to the expiry date.

Once topsoil is stripped and stockpiled for rehabilitation, Gravel is to be extracted and exported from the site.

It is anticipated that the pit will be operated during all or most months of the year, Monday to Friday from 7am to 5pm. It is also probable that activity will occur on site during Saturdays, such as some limited gravel extraction, maintenance works and stockpiling.

The size of the proposed gravel pit is approximately 40 hectares, split into two separate areas and anticipated to yield 1,200,000 cubic metres of gravel (based on an average depth of 3 metres). It is expected that an average of 200 tonnes of gravel will be crushed per day, during peak times (i.e. during the months of spring and summer) with less to nil production during wetter months. This equates to approximately 47,000 tonnes per year. As this is not greater than the *EPA Guide to Works Approval (July 2004) Production or design capacity of 50,000 tonnes of more*, and therefore not necessary to apply for a works approval or licence from Department of Environment.

2.3 STAGES AND TIMING

Gravel extraction will be gradual and staged to achieve a number of criteria, including:

- Limit the footprint of the extraction operation to mitigate any nuisance, environmental, safety or amenity impact;
- Maintain general site appearance;
- Reduce the demands for dust-control, safety, or other site management factors which increase proportionally with the size of the works area;
- Progressively rehabilitate land as soon as possible to promote reintroduction of fauna and flora;

As indicated on the feature plan found at Appendix B, there are two separated areas for extraction operation. Area 1 is located near the southern end of the site which will be mined in a north-south direction. After completion of extraction and rehabilitation of Areas 1, Area 2 (located on the western side of the site) will be mined in a identical process.

The operation of the gravel pit can be described as having times of 'low and peak periods', depending on the level of activity on the site. The occurrence of 'low periods' will most likely occur during winter months (due to high rainfall and subsequent moisture content in the gravel). 'Peak periods' will most likely occur once gravel extraction and site operation is more firmly established as well as during the months of spring and summer.

The stages and times of low and peak periods are indicative only and that some variations may arise during operation. This is due to the sometimes unpredictable nature of extractive industries and the difficulties in anticipating the timeframe for the commencement and completion of stages. The market demand for gravel will also influence the operation of the pit and the subsequent staging and time arrangements.

2.4 METHOD OF EXCAVATION

Gravel has been identified as being in the upper levels of the in-situ soil, therefore the need for deep excavation is not envisaged. Overlying topsoil is considered as being both unsuitable for use and needed for natural rehabilitation.

Therefore, excavation shall be undertaken in normal 'gravel-pit' operation methods. That being (in a progressive nature):

1. Topsoil (where present) is scraped off the surface and stockpiled for later reuse in rehabilitation;
2. Exposed gravel is ripped and excavated with earthmoving plant (Dozer, Excavator, Loader and Dump Truck) in progressive layers until a material change is the soil profile is reached;
3. Gravel is stockpiled adjacent to the crushing and screening plant for processing to commercial needs;
4. Haulage trucks are loaded to cart gravel off the site;

2.5 DEPTHS AND EXTENT OF EXCAVATAION

The depths of the extraction vary across the proposed pit location to follow the gravel and laterite profile of the soil. Laterite soil and rock has only been identified in the top layer and is anticipated to be from two to six meters deep. Due to the varying topographical nature of the site, estimated pit depths are relative. Once operational, if gravel quality deteriorates, excavation ceases and depths are minimised.

Gravel will be removed in consistent layers to give, where possible, a level floor and even work-face. Prior to surface rehabilitation, batter slopes will be formed to a stable shape of approximately 1:4.

2.6 DEPTH, DESCRIPTION AND QUANTITY OF OVERBURDEN

As mentioned in section 2.5 above, gravel appears in the upper soil profile, therefore, the excavation of overburden is not required.

2.7 CLEARING OF VEGETATION AND TOPSOIL STRIPPING

As mentioned in section 1.3 above, much of the natural vegetation on the site has been historically cleared for farming activities. Vegetation is predominantly retained in large clumps which are not affected by the proposed extractive industry operations, rather, they conceal them. Therefore, site preparation will not require clearing of any significance. Contour and Feature Plans at Appendix B illustrate the degree of clearing in relation to the area of the proposed gravel pit.

Any vegetation of significance which may be impacted by site operation shall be physically identified for protection to prohibit unnecessary disturbance.

As mentioned in section 2.4 above, topsoil is unsuitable as a commercial resource, but is necessary for native rehabilitation. Therefore, prior to any gravel excavation, topsoil shall be stripped to the depth necessary to expose the underlying gravel and stockpiled adjacent the works area for reuse. Much of the proposed gravel pit area has no topsoil present which either has the presence of expose rock or lack of crop vegetation.

Rehabilitation of the site shall include the respreading of in-situ topsoil over the entire works area to promote regrowth of natural and native vegetation.

As gravel extraction is to occur progressively to minimise the working footprint area, topsoil shall be stripped, stockpiled adjacent and replaced progressively. Topsoil is collected, stockpiled and replaced using common earthmoving plant, including graders, scrapers and loaders. Where topsoil is not present to any depth of significance, other soils such as clay and loamy soil not exported from the site will be used to form a rehabilitated surface which will be more suitable for revegetation than current in-situ.

2.8 ACCESS ARRANGEMENTS

Access to the site will be via Toodyay Road, approximately two kilometres north of its intersection with Bailup Road. An existing large crossover to the property will be used to permit property access. Traffic safety and site restriction for vehicles travelling on Toodyay Road have been considered. Trucks will predominantly access Toodyay Road on the southern 'west-bound' lane which has approximately 500 metres of clear site distance for 'west-bound' traffic.

Within the site, existing 'farm tracks' will be used, therefore, no new roads or access tracks are proposed. Routine maintenance of existing tracks will occur to safely handle semi-trailer type trucks.

Site Plan found at Appendix B identifies proposed crossovers and tracks to be used.

2.9 TRUCK MOVEMENTS

Toodyay Road is identified as a heavy-haulage route suitable for trafficking of quarry material. No local or minor roads are needed to be used. The impact on traffic volume for Toodyay Road is not significant compared to the current use.

Haulage of material from the site shall be by vehicles with normal, regular truck and trailer configuration permitted for use under MRWA road transport policy for heavy haulage. Generally, this shall be single and dual tipper trucks capable of carting 20 to 40 tonnes.

It is anticipated that truck movements (both in and out) from the site will vary, from few to none during low demand periods, and up to possibly twenty per day during period of high demand.

Truck movements are expected to increase during peak periods, though the volume of traffic is not expected to adversely affect current traffic volumes, either locally or on Toodyay Road.

MRWA published data for Toodyay Road adjacent the site has an average traffic count of 2,930 vpd (2004/2005). The traffic count of Toodyay Road increases to 6,110 vpd through Stoneville and 19,220 vpd through Jane Brook - which is the vehicle route for trucks carting extracted material to the Perth metropolitan region. The representation of increase to traffic count on Toodyay Road, which is already recognised as a dedicated heavy haulage road, is approximately 1.5% and considered an insignificant increase. Haulage vehicles, as they enter more populated areas south of Jane Brook, increases that respective vehicle count by only 0.25%.

2.10 PROPOSED PLANT, ON-SITE EQUIPMENT AND OTHER IMPROVEMENTS

Extractive operations shall be entirely temporary in nature. Earthmoving and processing plant will be temporarily mobilised to site and any improvement will be removed after final rehabilitation.

Temporary fixed plant shall be:

- a processing plant to crush and screen extracted gravel into usable product. The crusher is approximately twenty five meters long and five meters wide. Power will be provided by an appropriate generator (est. 200 kVa size). The engine is housed in a sound dampening container, which will provide some noise reductions;
- a fuel storage tank appropriately secured with restricted access fencing, tamper-proof padlocks, emergency bunding and environmental protection measures;
- a temporary office building to service labour needs, management and general storage;

The temporary fixed plant will be located near the proposed extraction area to minimise the works footprint. Plant will be appropriately signed and operated to Worksafe recommendations with strict public access restrictions.

Section 2.4 above discusses proposed non-fixed plant. Security will include a temporary fenced compound erected near the proposed site office.

2.11 STORMWATER DRAINAGE MANAGEMENT, EROSION PROTECTION AND WATERCOURSE SILTATION PREVENTION

The site topography varies from medium to low slope grades so stormwater runoff naturally follows those contours into depressions and valleys. Soil type is heavy clay/gravel and undisturbed at the location of and near the gravel pits. Other land has agricultural crops.

Stripping of topsoil and ground disturbing operations can permit stormwater overland flow to collect and transport sediments down-stream into valleys and watercourses. Further, excavation across contours can cause stormwater runoff to be concentrated and advance scouring with similar sediment impact.

Proposed extraction of gravel will undergo removal of topsoil and exposing in-situ gravel which may affect contours carrying overland water flow. Therefore, stormwater management is critical to maintain the working area and prevent scouring and sediment transportation to waterways.

The following measure shall be implemented:

- Construction of local catchment drains to deflect stormwater from collecting in excavation areas and diverting pre-flow away and around construction sites;
- Monitoring of any artificial water concentrations causing scouring and stabilise with site material (rocks, gravel or topsoil) as and when encountered;
- Construct sediment filtration structures at critical points around the works area. Low points where water is discharged off excavation areas shall be screened to remove the greater volume of sediment scoured and carried off these areas. This shall be in the form of riprap, fabric screens, hay-bail weirs, or a combination of these methods;

Proposed gravel extraction areas are located at higher contours which shall permit stormwater management processes to be implemented well before discharging into depressions and creek lines. Pre and post development flows shall be near identical once site rehabilitation is complete.

2.12 DUST MANAGEMENT

Dust lift-off is recognised as an event caused by normal, day-to-day earthmoving operation which will be undertaken in the extraction of gravel from the site. It can be mitigated though the application of several processes, including:

- Dust created from transporting material off the site and over public roads will be managed by appropriate use of tarpaulins covering trucks leaving the site;

- Access roads and operating areas within the site will be watered using a water cart as required to suppress dust lift-off under plant movement;

- Stockpiles shall be managed in height and moisture to reduce dust-lift off in high winds;

- Rehabilitation of finished extraction areas shall include stabilisation with direct seeding to promote long-term, natural vegetation dust control;

Water for dust control shall be sourced from agricultural dams and natural soaks already present on site. Refer to Dust and Noise Management Plan found at Appendix C for more information.

2.13 PUBLIC SAFETY

Public access to the site will be restricted and appropriate warning signs will be placed at the entrance to the site regarding quarrying, safety and restricted entrance. At the request of the Shire or road authority, 'truck-entering' advanced warning signs will be erected on Toodyay Road at appropriate locations.

2.14 NOISE MANAGEMENT

The site is located on large rural land holdings and predominantly surrounded by rural land. However, noise impact is still carefully considered to comply with *Environmental Protection (Noise) Regulations 1997*.

The gravel extraction process does not involve blasting or excessive noise-generating practices. Operation of earthmoving, crushing and screening plant, generators and movement of trucks will be part of normal operation noise which is investigated herewith for its impact.

Topography and pre-existing vegetation in the form of large, dense clumps naturally create screening from noise, dust and visual pollution. However the proximity to dwellings has been examined to determine line-of-site and any possible adverse noise impact.

Landform topography prevents line-of-site from the proposed gravel pit Area 1 to any dwellings near the site, which are all greater than one kilometre away. Some roof-tops are visible two kilometres north of the Area 1, but are nestled in dense tree-scapes. Area 2 is also located on a hill-top and has some line-of-site view to dwellings northwest approximately one and a half kilometres away. Therefore no adverse noise impact is anticipated.

Distance, obscured land form and dense vegetation (primarily large trees) at various intermissions over more than one kilometre conclude that noises impact would be minimal if at all detectable. Based on the site examination, a noise impact study is not deemed necessary. Refer to Dust and Noise Management Plan found at Appendix C for more information.

2.15 ENVIRONMENTAL IMPACT

Impact on the environment is an unavoidable consequence of any form of ground-disturbing operation, major or minor. The degree of impact can be assessed in a number of environmental categories to determine the safeguard or restricted practise measures to be implemented:

- Preservation of flora and fauna.
  Department of Environment and Conservation (DEC) publishes declared rare flora and endangered fauna (DRF) data identified across WA to recognised species and regions for special management and protection. A DEC search for declared rare flora for the site and its surrounding area retrieved no record of DRF.

  Nonetheless established native vegetation is clearly identified on the site and exists as large clumps amongst cleared land historically used for agricultural pursuits. All but a very small fraction of these tree clumps shall be left undisturbed and protected from extractive industry.

  The site is occupied with agricultural farming (cropping and grazing) over the entire area. Native fauna is generally scarce in open paddocks when nearby trees, and other dense vegetation provides natural habitation. Therefore, impact on fauna would be limited to daylight noise and vibration which will alert fauna from entering the works area.

- Protection of Waterways.
  Section 2.11 discusses the potential impact of overland stormwater flow carrying sediment from works areas to creek lines and other natural depressions. Red Swamp Brook is located 'downhill' from part of the proposed excavation area although not immediately adjacent (closest point being 600 meters away from Area 1). Therefore the natural watercourse or its surrounding depression will not be encountered during the works. Further, the implementation of stormwater management procedures will protect Red Swamp Brook from artificial elevations in sediment discharge or other pollution.

  Another area with natural water is located in the southwest corner where a 'soak' creates a wet area that has no defined watercourse. An existing small dam will be shaped to allow for water extraction for dust suppression and other activities to effectively undertake extraction at the nearby Areas 1 and Area 2. Refer to Appendix B Site Plan for location details.

- Conservation of topsoil and rehabilitation.
  Environmental impact must consider the preservation of scarce in-situ topsoil which carries beneficial micro-bacterial organisms, native seeds, and a growing medium suited to native vegetation. This 'topsoil' is generally considered unsuitable as a commodity while being necessary for site rehabilitation. Therefore, pre-excavation

works shall collect and conserve topsoil (where present) for respreading over disturbed areas after completion of extractive industries. Remove of the 'shallow' layer of gravel underneath the topsoil is not considered a serious environmental impact when coupled with the above points. Land contours will be altered and depressed where underground gravel is removed, although the general overland topography will remain the same. Surface soils and their contents will be conserved as rehabilitation seeks to reconstruct a site of similar to pre-works condition. Section 3 below discusses rehabilitation in greater detail.

2.16 EXISTING VEGETATION PROTECTION

As described in section 2.7 above, existing vegetation of significance is segregated into clumps of native species of tree and bush. The majority of the site has been historically cleared to permit agricultural activity.

Clumps of native vegetation are clearly identifiable on the site and are not encountered in the area of the proposed extractive industry, except for part of one group of trees at Gravel Area 1. Further, access roads already exist and will not require destruction of vegetation to permit access.

Isolated trees are scattered around the previously cleared land parcels. Some of these may be encountered under the extraction footprint and will be felled. These are not common and will not significantly affect the landscape, environment or aesthetics. Revegetation of the extraction area will include planting native trees and bushes to replace those felled to an adequate or greater comparison.

2.17 VISUAL AMENITY

Rural viewscape is directly proportional to potential noise impact where topography and vegetation act to screen noise as well as line-of-site. Section 2.14 above evaluates the potential noise impact on adjacent dwellings.

Undulating topography visually screens all existing dwellings except those located one to two kilometres north of the proposed extraction areas, however these semi-rural dwellings have significant tree and vegetation screening to filter noise and impair line-of-site.

The only nearby thoroughfare is Toodyay Road. This is a major road and identified as a heavy-haulage traffic route. Nonetheless, Toodyay Road is densely vegetated on either side with trees and bushes along its entire length adjacent the site. Extractive industry is proposed Area 1 is 1.5 kilometres from Toodyay Road and Area 2 is between 200 and 800 metres away. Therefore the likely visual impact from earthworks type operations could only ever be a short section of obscured, distant view. There is no adverse visual impact.

3 REHABILITATION AND DECOMMISSIONING PROGRAM

3.1 OBJECTIVES OF REHABILITATION

Post extractive industry rehabilitation is important to the proponent who houses a 'better-than-found' philosophy for their projects - whether in primary production, organic farming or land development. Through commitment to a rehabilitation program and responsible environmental management, the site is preserved after below-ground resources are extracted so that the future development potential of the site is not compromised.

Recognised as an existing natural resource and an agricultural resource, the site needs to continue to compliment both when rehabilitation occurs to areas disturbed by extractive operation. This primarily applies to the surface of the site (landform and topsoil) and vegetation thereon.

Rehabilitation and revegetation is beneficial. Its goal is to create as close to a pre-existing state as possible with an effort to *improve* environmental causes, including:

- Encouraging the expansion of native fauna and flora to rehabilitated areas;
- Establishing greater vegetation replacement to benefit environmental concerns, aesthetic views, soil improvement, erosion protection, salinity control, and many other factors which come from successful planting and growing native trees and shrubs;

The rehabilitation methodology demonstrates that these goals are practical and likely to be achieved.

The intensity of rehabilitation and revegetation is a product of how the site exists pre-development. Section 2 above identifies the works area as having undulating topography and being already historically cleared. Therefore, the demands on rehabilitation and revegetation are not onerous.

3.2 REHABILITATION METHODOLOGY

Rehabilitation shall be undertaken in a progressive manner. This shall minimise the physical works area at any one time. A reduction of working area will mitigate visual impact, environmental impact, dust lift-off, stormwater runoff and sediment stripping, use of watercarts and other whole-of-site management. Further, staged rehabilitation introduces fauna and flora faster, allowing establishment to take place sooner.

Gravel extraction will start at the northern part of Area 1 and move south at a depth determined by the suitability of gravel encountered. Once economical-sized areas have been mined and no longer needed, rehabilitation will occur. Area 2 will be mined only after completion of Area 1 and rehabilitation is underway.

3.3 BATTERS AND LANDFORM

The site will be rehabilitated as gravel excavation progresses through each phase. As gravel has been extracted from the site, the landscape will be on a lower level than it was previously. Raw gravel extraction may create steep slopes which can be both unsafe and unsuitable to effectively rehabilitate.

The perimeter of completed extractive operations areas will be battered to best match the surrounding natural landform. Grading and flattening batters to blend natural and artificial levels will be undertaken site specific - considering the impact of expanding ground disturbing activity outside of the gravel pit footprint. A 1:4 batter is sought as a rule-of-thumb, but existing vegetation and undulating contours will determine final grades.

Topsoil and vegetation can establish easier on flatter surfaces. Steeper grades can be both unsafe and prone to stormwater scouring, particularly when rehabilitated with loose topsoil. Scouring then carries away or destroys seeds and direct planting. Therefore, as reasonable as possible, and without increasing the environmental impact, grades shall be blended as shallowly as possible prior to respreading topsoil or revegetation. Assisting the regrowth of fauna in this way will, in turn, stabilise banks and batters more efficiently.

3.4 TOPSOIL

As discussed above in the works methodology (Section 2), topsoil shall be conserved. Prior to excavation of staged extractive industry areas, topsoil is scraped off the surface to a depth which can be identified as soil suitable for rehabilitation. That thickness varies but is non-existent where rock is on the surface and elsewhere is nominally less then 100mm thick. Topsoil is stockpiled adjacent the works area where any seeds are kept in the soil and grasses are able to naturally break down and increase the soil health.

After gravel extraction and reforming the site to blend into the surrounding area, topsoil is evenly respread over the surface and lightly compacted. Seasonally adjusted, water is applied to assist in crusting the surface to prevent wind-borne dust lift-off.

Revegetation shall occur as soon as possible after topsoil respreading (see section 3.5 below) to encourage stabilisation of topsoil. Direct seeding will be undertaken over-and-above revegetation to stabilise topsoil quickly, particularity on batters subject to erosion.

As works are progressive, the site is easier to manage for rehabilitation success. Topsoil affected by scouring can be restored with other operations occurring on site as they are encountered.

3.2 REVEGETATION

Revegetation of this site will take place when it is most practical and will enhance the chances of success of plant re-colonisation. Landform rehabilitation will occur before revegetation commences. This includes placing topsoil over disturbed areas to generate a suitable medium for plant regrowth. Only plant species endemic to the area will be planted.

As the goal of revegetation is to return the species composition and density of the site to that of the surrounding land, the main priority is to ensure that the same or similar plant species that were present on the site are used for revegetation.

In accordance with acceptable practise, direct seeding and planting will be undertaken to assist in revegetation of the site. Three trees will be planted for every tree removed to account for possible deaths of plants during establishment. The density of revegetation will be approximately one plant per five square meters.

Revegetation should occur in the first autumn/winter season following landform, rehabilitation to increase the survival success rate. It is important not to delay seeding and replanting for longer than one year after topsoil has been added as the soil can become compacted which makes it harder for seeds and plants to survive. It is also important to start seeding and replanting after the first rains of winter season to allow the soil to become moist. This places less stress on plants and ultimately leads to greater survival rate and greater revegetation success.

Preferably, seeding and planting will occur progressively as each stage of the site is rehabilitated after gravel excavation. However, due to the nature of mining activities, there might be some deviation from this timeline. As the next stage of mining will occur very close to rehabilitation and revegetated area, this might cause some disturbance and hinder the success of plant regrowth. Therefore, some degree of discretion will be required when determining when to commence revegetation in order to help increase survival rates.

Weeds (plant species that are not endemic to the area) can have a significant impact on revegetation of endemic species if inappropriately managed. The presence of weeds should be identified through monitoring efforts and will be controlled through selective herbicides such as Roundup or controlled manually if possible. It is also important to ensure that the plants and soil bought into the site are not infected with *Phytophthora cinnamomi,* sometimes called 'jarrah dieback'.

3.6 MONITORING AND MAINTENANCE

The purpose of monitoring is to assist the success of rehabilitation and revegetation efforts and to determine whether certain objectives or goals have been achieved. It can also indicate whether the revegetation plan requires modification to help reach this goal more efficiently. In this case, the ultimate goal of rehabilitation and revegetation is return the vegetation of the site to a self sustaining, pre-mining state (i.e. to a similar species composition and density). It is important to note that this state differs from the pre-clearing or pre-farming state. Monitoring the species composition and density of the vegetation on the site will help indicate whether this goal has been reached.

In general, monitoring involves measures specific qualities of vegetation. In this case, the species composition and density will be monitored. Monitoring will be conducted at regular intervals (approximately every six months) over three years in order to obtain appropriate

amounts of information. This will help detect any negative changes or issues, which can be attended to and rectified as soon as possible.

Weed monitoring involves assessing the amount of exotic species present in an area. Depending on the results found, eradication measures should be employed in order to remove as many weeds as possible to increase the success of native vegetation regrowth. Weed monitoring is more important when the ultimate goal of revegetation is to return the site to a natural state. Therefore, it is impractical to attempt to destroy all weeds on site. However, due to the extremely destructive nature of certain weeds and there tendency to spread fast and efficiently, it is important to monitor whether potent weeds are present and spreading so appropriate action can take place to hinder their growth. In this situation, native and exotic species will be monitored simultaneously to improve efficiency.

A simple monitoring exercise will be performed to determine the species composition and density. This involves setting up approximately ten 'quadrants' measuring 5m by 5m in randomly selected locations around the site. The different species in each quadrant will be identified and the number of plants of each species should be recorded. The density of each species can be analysed over time in order to determine the growth or death rate. Relevant actions such as replanting or weed eradication will be undertaken if the information obtained is unfavourable. Monitoring will take place approximately every six months to obtain information for comparison.

It can take a few years for native species to re-establish in an area after rehabilitation has commenced. Therefore, monitoring will be conducted for three years following the rehabilitation and revegetation of each stage. This should be sufficient time to indicate whether the rehabilitation goals have been met.

3.7 FINAL SITE CLEAN-UP

All waste on site will be appropriately managed during and after operation of the site in order to avoid environmental degradation. Rubbish will be stored in large bins, which will be emptied at a rubbish tip.

After gravel extraction activities have ceased, all equipment will be removed from the site and the final stages of rehabilitation and revegetation will occur.

Soil contamination which occurs during any time of the extractive industry from the works (which has not already been identified and removed during the operations) shall be collected and removed at final clean-up. Specific attention shall be made to soils under or adjacent fuel and oil storage and fixed processing equipment for hydrocarbon contamination.

It is expected that once the vegetation on this site is re-established, it will be used for agricultural purposes (i.e. cattle grazing) once the plants on the site are thoroughly established. The site also has residential development potential which must be considered in the rehabilitation operation.

Appendix A

Landowners Consent:

Appendix B

Maps and Plans:

- Contour Plan
- Feature Plan
- Soil Map
- Certificate of Title Extract
- Lot Dimensions Plan
- Surveyors Datum Peg Map

Appendix C

Dust Management Plan

Appendix D

Application Forms

- Shire of Mundaring Town Planning Scheme No. 3 Form 1 *Application for Planning Approval to Commence Development and/or use*

Extractive Industry Application

Annexure 2

MASTER Management Plan

for

GREENWAVE NOMINEES

at

Lot 7 Toodyay Road, Bailup

10 September 2010

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EXECUTIVE SUMMARY

This Annexure 2 *Master Management Plan* is submitted to Shire of Mundaring as a supplementary document to Greenwave Nominees' ("the proponent") application to develop Extractive Industry on Lot 7 Toodyay Road, Bailup ("The Site").

The proponents have sought a Development Approval and Operating License. Through due process, a revised set of *Management Plans* have been formulated to govern protection measures during proposed activity. They include:

- Dust Management Plan
- Stormwater Management Plan
- Water Monitoring Management Plan
- Rehabilitation Management Plan
- Noise and Amenity Impact Management Plan

This *Master Management Plan* amalgamates all individual management plans into a single document, to satisfy the Shire of Mundaring's requirements. It should be read in conjunction with the proponents' Development and Extractive Industry License Application and supplementing documentation.

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1 INTRODUCTION

1.1 BACKGROUND & SITE DESCRIPTION

Greenwave Nominees ("the proponent") have sought a Development Application and Operating License for Extractive Industry at Lot 7 Toodyay Road, Bailup ("The Site").

The site comprises of Lot 7 which is 375.4623 hectares of rural land.

The majority of the site has been historically cleared and used for many decades for cropping and grazing. Some large clusters of natural vegetation, in the form of trees and shrubs, are found in various locations. Other isolated trees are located sporadically elsewhere.

The topography is generally gentle with relativity flat to moderate grades which elevate the land from approximately RL 265 AHD to RL 338 AHD. The land form rises in the south, west and east and is divided by Red Swamp Brook running southeast to northwest through the northern central portion of the property. The site is not considered at risk of flooding. Red Swamp Brook is recognised as a constrained area and this feature is therefore protected from the proposed development.

The site is boarded to the north by Toodyay Road for approximately 2.8 kilometres. Toodyay Road is the primary road access for the site. Lot 140, which borders most of the northern boundary is also owned by the same entity as Lot 7.

A dwelling is located central north in the valley where Red Swamp Brook runs north under Toodyay Road. The other neighbouring land holdings are large, undeveloped, rural landholdings to its west, east and south which have been predominantly cleared for rural use. Further north are semi-rural residential properties nested amongst dense native vegetation.

Extractive Industry is proposed at 2 locations which total approximately 42 hectares in size. Works shall be progressive with up to 8 hectares under operation at any one time

1.2 PURPOSE OF THIS MANAGEMENT PLAN

Proposed activities are of an earthworks nature, which is recognised as being of environmental and social impact; that being, clearing existing vegetation, altering landforms, and creating dust and noise through ground-disturbing, processing and hauling activities.

The recognition of potential adverse impacts from noise, dust, clearing and other elements requires the proponents to appropriately manage those things. This *Master Management Plan* discusses these potential social and environmental risks and prescribes on-site control and management processes accordingly.

2 DUST MANAGEMENT PLAN

2.1 BACKGROUND

The proponent's application for an Extractive Industry DA and License has investigated the risks, potential nuisance, mitigating factors and likely impact of the operation on the surrounding environment, including that of wind-carried dust off the site. In brief, the proposed area of activity is:

- isolated and far from dwellings, the nearest being approximately one kilometre away [Buffer Distance];
- hidden from adjacent land holdings', dwellings' and thoroughfares' line-of-site by undulating land topography and existing vegetation [Visual Impairment];
- moderately screened from prevailing winds by existing dense clumps of natural (and tall) vegetation, which are to be protected [Natural Protection];

Nevertheless, the creation of dust is unavoidable and must be properly managed to mitigate nuisance and any other potential risk to surrounding properties, dwellings, vegetation, waterways, road users or to workers on site.

2.2 PURPOSE

Recognising dust can be created by on-site activity and by movement of vehicles to and from The Site, both activities are to be managed to mitigate that impact. Although isolated, wind can carry dust outside of localised buffer areas if unchecked.

Recognised and industry standard practises for dust control are well-established across Australia. Those methods are proposed to be utilised at The Site to suppress dust and reduce the risk of adverse wind-born dust lift-off.

Predicted activities creating *dust risk* are:

- exposing un-stabilised and non-vegetated soils to prevailing winds;
- carrying, loading and stockpiling soils;
- wheeled plant movements over un-stabilised surfaces, including cartage tucks travelling on gravel tracks to and from The Site.

Management of these activities are an effective way to prevent adverse effects of dust. The purpose of this Management Plan is to review the risks and control measures to appropriately manage dust and mitigate its impact. Site managers and personnel shall be instructed on Dust Management issues outlined in this document.

2.3 AUTHORITY REQUIREMENTS

As commented in the Officers Report, File Code To 3.3650 11-May-10, "Dust is to be managed in accordance with the Health Act 1911 and the Shire's Health Local laws 2003."

The Health Act 1911 prescribes the need for industry to mitigate the impact of "offensive matter" which includes "dust". The potential impact of dust from extractive industry on sensitive premises needs to be investigated and appropriate management plans implemented.

The Shire of Mundaring Health Local Laws 2003 does not specifically address dust created from construction or activities similar to those proposed by extractive industry, over and above The Health Act 1911.

This Dust Management Plan considers the potential impact, control mechanisms and action plans for day-to-day mitigation of dust and its impact on the surrounding environment.

2.4 DUST MANAGEMENT

Recognising the potential dust-creating activities, a number of key management practises and procedures are to be implemented. This Section describes those dust control measures in detail. However, the day-to-day implementation is a matter of on-site management considered daily events. Therefore, a matrix of events versus on-site action is found at Appendix 1C to prescribe when different dust control measures are to be used.

2.4.1 MONITORING OF WEATHER CONDITIONS

Dust created and/or carried by prevailing winds is the primary culprit of dust problems. Strong winds can create dust lift-off from exposed un-stabilised surfaces. Localised dust created from activities such as lifting and handling soils are also carried by winds. Vehicle traffic along unsealed roads causes dust lift-off, which is not a nuisance unless carried by prevailing winds.

Therefore, weather and wind conditions must be monitored. Generally, no wind means minor dust nuisance; high wind cause dust to travel off site. The direction and speed will vary that effect.

Wind influence is also related to rain events. Natural dust suppression shall be considered on a day-to-day basis. Rain events will wet unsealed surfaces and naturally prevent dust lift-off. This manages both the potential nuisance and negates the need for drawing of water from the allocated water source and employing watercarts for dust control.

Bureau of Meteorology and other weather forecast services are to be used by site supervisors to assist in issuing day-to-day instructions relating to dust control and if necessary temporarily suspend works. If strong winds are predicted, or are experienced, then appropriate and additional dust control measures are to be implemented to ensure that dust is not excessively carried off the works area.

2.4.1.1 Bureau of Meteorology Data

Rose of Wind direction versus Wind speed and *Median Rainfall data* is found at Appendix 1D. This data compiled over 45 years from the nearest weather monitoring station, provides the following relevant information is demonstrating potential dust impact from the site to dust sensitive premises:

- Wetter period (May through September):
  - This is the period of greatest rainfall which will create natural dust suppression in lieu of using a watercart
  - Morning wind speeds are recorded as calm for approximately half of all days and otherwise predominantly very low
  - Afternoon wind speeds are approximately 11% calm while otherwise are predominately low (0 to 10 kph).
  - Wind direction is even throughout the dial, although afternoon winds are recorded more regularly in a west-northwest direction.

- Drier period (October though April):
  - This is the drier period of the year with less regular rainfall and manual application of water would be necessary for dust suppression
  - Morning wind speeds are approximately 13% clam as calm and otherwise very from 0 to 20 kph and up to 30 kph
  - Afternoon wind speeds are approximately 8% calm while otherwise are predominately low to moderate low (0 to 30 kph and up to 40 kph).
  - Wind direction is generally southeast and east in the morning while recorded predominantly east through to southwest in the afternoon

Rose recording of wind direction provides the following conclusions:

- During wetter months rainfall will assist in daily dust suppression, reducing the needs for drawing water and applying with a watercart
- During wetter months wind speeds is often 'calm', or otherwise low.
- During wetter months wind direction in a northerly direction is encountered much less frequently – north of proposed activity being the primary location of residential dwellings.
- During drier months, low rainfall will create the need for regular use of a watercart to suppress dust on exposed, un-stabilised surfaces.
- During drier months, wind is encountered more regularly and at a greater speed than wetter months, however the wind direction is predominantly south, southwest and west in the morning and across the southern part of the dial in the afternoon. Once again, north of proposed activity is where residential dwellings are located.

Therefore, a *Wind-Rose* analysis demonstrates that impact to dust sensitive premises is low and often reduced by the prevailing winds

Dust management shall always be a day-to-day consideration as rainfall, wind direction and wind speed vary daily.

2.4.2 DUST SUPPRESSION & PREVENTION

Dust suppression is the management of activities and aspects on The Site which cause dust lift-off. Those aspects are detailed below and prescribe management processes to mitigate dust nuisance. However in all of these, seasonal influence will decrease or increase the case-by-case needs. For example, dry seasons will reduce the effectiveness of water suppression; windy periods will increase the distance of dust escape; wet seasons will generate natural dust suppression.

2.4.2.1 Exposed Surfaces and Traffic

Soil stockpiles, un-stabilised surfaces and areas under traffic (including internal roads used by trucks) will be suppressed with water applied by appropriate machinery kept on site full time ('watercarts'). Water is available from a localised soak and adjacent dam in the south-west corner of The Site. Volumes of water used will be dependent on the prevailing weather conditions, however, minimised to reduce waste, erosion and machine use. Wind speed, direction, location and point of influence shall determine site specific decisions for where water shall be applied. Section 2.5 of this document describes the water source proposed and discusses its limitations.

More permanent stabilisation of surfaces (primarily those areas being rehabilitated) shall be employed in lieu of on-going application of water. These are discussed in Section 2.6 of this document.

2.4.2.2 Soil Transport Off Site

Material exported off The Site (gravel) will be carried in truck bodies of various size and configuration – generally open-top, tipping trailers. During transport, dust can be lifted out of these open trailers and cause nuisance and other problems along the travel route from The Site to delivery destination.

Two industry standards have been in effect which either/or shall be used for all loaded trucks leaving The Site:

(1) Gravel shall be wet after being loaded.
(2) Truck loads shall be covered with suitable tarpaulins.

2.4.2.3 Processing material

Crushing, screening and stockpiling gravel will be undertaken by fixed temporary plant and can cause dust pollution when soils are elevated and moved. Thoughtful location of the processing plant can greatly reduce wind-influence.

The processing plant shall be established at a location having the greatest wind protection within close proximity to the extraction area. Located at lower ground levels and concealed

by nearby existing clumps of dense vegetation will screen gravel which is being processed from wind. Close proximity shall also reduce the time gravel is exposed to wind during transportation within The Site. Refer to Location Plan found at Appendix 1A.

Site supervision shall still have the authority and responsibility to suspend gravel processing should wind still adversely impact the processing plant.

2.4.2.4 Road Sealing

The crossover for The Site has been proposed at the existing access onto Toodyay Road. This location has been accepted by MRWA with condition for an intersection upgrade. In conjunction with the intersection upgrade, the adjacent portion of the internal gravel road shall be sealed with a bitumen and aggregate surface treatment. For a length of 70 meters, this portion of sealed road will encourage the removal of dust from vehicle wheels before traversing Toodyay Road. This shall mitigate dust moving off site and affecting Toodyay Road and its users.

2.5 WATER USAGE

Although dust control is managed by a number of key operation activities (described above), the primary mechanism for dust control is by the application of water over exposed surfaces. This requires a suitable water source.

2.5.1 WATER SOURCE

Water for dust suppression is proposed to be taken from a dam located in the south-west corner of The Site as detailed in the EIL Application 20-Oct-09, refer to location plan found at Appendix 1A. This is recognised as a suitable, safest, cheapest and least impacting source.

The existing dam is located on the eastern side of an isolated low-lying area where approximately 2.5 hectares is either waterlogged or has water ponding on the surface (often termed a 'soak'). Adjacent elevated landforms with dense surface and underlying soils direct stormwater to this low-point. There are several trees located on the boundary of The Site in this area and further west is a small group of trees. The surrounding land is used for cropping and grazing. There are no near-by areas of significant vegetation or bushland susceptible to significant fluctuations in surface water. This wet area is completely separate from Red Swamp Brook. It is not and does not form any type of creek or river system.

Department of Water has been consulted regarding taking of water and concur with the above conclusions. They have not placed any conditions on the development and have confirmed that the proponent "does not require a licence [to regulate consumption] as water is being taken from an existing dam/soak which is not creek or bore fed."

2.5.2 WATER VOLUMES REQUIRED

An estimate maximum volume of water required to be taken from the dam for dust suppression is as follows:

During Dry/summer:	up to 9 loads per day (1 load per hour)
During Wet/winter:	down to nil loads per day
Volume of watercart:	10 kilolitres
Estimated days of watercart operation:	100 days per year
Estimated average daily use:	45 kilolitres
Estimate annual use:	4,500 kilolitres

These volumes are an estimated maximum consumption, however other factors will reduce the requirement to take water and include:

- during days where The Site is not in operation such as public holidays;
- during periods where sales and depressed market factors required the temporary closure of The Site;
- the use of alternative forms of dust control as detailed in Section 2.6.

2.5.3 ASSESSMENT OF CAPABILITY AND ENVIRONMENTAL IMPACT

The impact of taking water from this dam on the surrounding area can only be estimated. However, some circumstantial information can be considered to ascertain if the water required to be taken would be considered a 'significant volume' or a 'significant impact'. That being:

- The shallow water table (or localised shallow spring) penetrates the surface in this area and ponds on the surface. Water appears to enter the dam from the underlying surface and localised ponding. Catchment from the surrounding hills direct stormwater overland and subsurface to this adjacent low-point where sufficient water volumes breach the surface.

- An area of approximately 2.5 hectares is waterlogged and inaccessible by vehicle. Some water travels overland west but quickly re-enters the ground as there is no clear depression or identifiable creek-line.

- Surface water is created by a localised catchment and affected by a shallow, superficial water table. Collection of overland and subsurface water flow from adjacent elevated land directs water to this location. Catchment water volumes are estimated in the millions of kilo-litres and are affected by a multitude of variables. They are also affected seasonally such as the winter increase in the water table

which expands the size of the waterlogged surface. Refer to Hydrologist Report found at Appendix 1B for more detail.

- There is no water course, creek, wetland or other special environmental concern nearby. Water which penetrates the surface and ponds in this area is confined to the area. There is no evidence of a spring fed creek-line and it is not linked to Red Swamp Brook.

As the low area is likely to be a point with which the local water catchment protrudes the surface it is not feasible to measure the volume of water which may be encountered. Estimates of catchment has been made and found at Appendix 1B. Suffice to say, perched and local water tables can be affected by subsoil drains, earth working land forms and performing dewatering or other temporary water taking activities. The sorts of activities which are temporary in nature and not considered to be large volumes, such as 4,500 kL per annum, would do little to affect the localised ground water impact.

Ground water mapping and other exhaustive water monitoring would need to be undertaken for multiple seasons to obtain an estimate of maximum and minimum levels and would not demonstrate volumes to a degree of accuracy which would identify drawing 4,500kL over the whole of the year. *The volume proposed to be taken is simply not significant.* Being shallow/superficial, any data collected would not be suitable for relevance over subsequent years.

Shallow aquifer groundwater is, by nature, encountered in large volumes. Water extraction from the surface would bear little to no impact as the existing dam would simply recharge with the ground water from the immediate area. The rate of recovery would vary by the soil type, topography and head-pressure of underground water.

A recent study undertaken by a Hydrogeological Consultant concurs with the above assessment of the water availability and concludes:

> *"The groundwater causing the waterlogged area around the soak/dam should be capable of supplying 4,500kL per annum based on the rainfall recharge calculation."*

A full copy of the Hydrogeological report is found at Appendix 1B

2.6 ALTERNATIVE DUST CONTROL MEASURES

Although the identified water source has sufficient capacity and capability, because exact available volumes are unknown during seasons where water is more often required to be drawn for dust control (summer), this management plan identifies provisions for alternative

dust control measures which reduce the requirements for drawing water and are a back-up should water be temporarily unavailable from the proposed dam.

2.6.1 HYDROMULCHING AND SEEDING

The proposed extractive industry operation is staged. Sections of the pit are mined in stages up to 8 hectares at a time and then rehabilitated in a manner befitting efficient operation, but minimising the nett area of disturbed surface. Dust control includes the need to mitigate dust lift-off from areas which are rehabilitated but not yet revegetated sufficiently to naturally stop dust nuisance.

The application of a paper-water mixture to bare soil surfaces is used to create a temporary crust and prevent wind-borne dust lift-off. The addition of grass seeds within hydromulch can increase the population of native vegetation germination where applied. Hydromulch is suitable for large areas that are not trafficked or disturbed and allow for the eventual overgrowth of grasses which then form a permanent soil stabilization and dust control mechanism.

Seasonal weather permitting, direct seeding of native or other grasses suitable for the return to rural agricultural activity can be an effective long-term stabilisation plan. Once topsoil is respread over completed extractive industry stages, those areas not revegetated with trees and shrubs can be sown with seeds during winter/spring season which will allow germination and stabilisation of the surface. Species of seed shall be selected after consultation with the Shire of Mundaring Environmental officer.

The revegetation management plan for the proposed Extractive Industry includes on-going monitoring to ensure that revegetation, including dust control measures detailed above, are successful, and if necessary, require on-going or repeat action.

2.6.2 WATER ADDITIVES

An alternative to Hydromulching, and used for temporary stabilisation of gravel roads, are water 'additives' which superficially penetrate the gravel surface and coagulate as water evaporates to leave a starch-like bond of the surface. Acting as a bonding agent, fine gravel particles are held from becoming air-borne. This is a temporary alternative with its effect determined by traffic volumes.

The effect is that water consumption can be reduced. The use of water additives is an available all-year-around option for The Site supervisor when considering the number of vehicle movements as well as the volume of water available at the water source, should the dam recharge rate be too slow.

Although this alternative does not completely negate the need for water, it can reduce the amount of water required. Listed as an 'alternative', water additives are likely to be used nonetheless, subject to satisfactory supplier demonstration for the works proposed.

2.6.3 SUSPENSION OF WORKS

Operation of the Extractive Industry is managed day-to-day by an on-site manager. His/her responsibility shall include the recognition of dust control and the mitigation of dust nuisance to the greater environment.

Armed with the dust control measures described in this management plan, an all-authoritative back-up for adverse dust nuisance condition shall be to temporarily suspend works causing the dust problem.

In the same manner, complaints and order to stop work are enforceable under the governing laws which mandate dust control must be undertaken to the satisfaction of the regulatory authorities.

2.6.4 OTHER ALTERNATIVES

Storage of excess winter water in holding tanks is unviable as massive water tanks would be necessary and are an inefficient and expensive option to the existing earthen dam which historically has held water all year. Minor engineering of that dam, including deepening and formalising its shape will help concentrate localised water to an efficient reservoir expected to contain sufficient water for the proposed activity's needs.

The proponents are also permitted to apply for a water bore through the appropriate regulatory authority should this be an option of last resort to obtain water for dust control purposes.

3 STORMWATER MANAGEMENT PLAN

3.1 BACKGROUND

Proposed Extractive Industry activities are of an earthworks nature, which is recognised as a ground-disturbing operation. Stormwater impact which is affected by the proposed operation must not adversely affect the environment through such problems as nutrient concentrations, erosion or overland flow affecting sensitive water features. Red Swamp Brook is located approx 500m northeast of the proposed extractive industry areas and must be sufficiently protected.

3.2 PURPOSE

The proponent's application for an Extractive Industry DA and Licence has investigated The Site conditions and constraints. This included some comment as to the predicted impact of stormwater and what control methods shall be adopted on site.

The purpose of this Management Plan is to investigate the impact of stormwater overland flow on and around the proposed activity by cause of the activity. That impact is to be mitigated and managed so as not to aversely affect the environment through movement of water from the works area.

3.3 SITE STORMWATER CONDITIONS

3.3.1 PRE-DEVELOPMENT FACTORS

Topography

The Site topography varies from medium to low slope grades (up to 1:10) of which two of the western 'hilltops' are the proposed extraction locations.

Extraction Area 1 falls from northwest to west to south in a direction leading into depressed contours within The Site:

- North-northwest grades lead into approximately 10 hectares of moderately dense native vegetation (trees and bushes). Red Swamp Brook is approximately 700 meters north of this area. There are no landforms or drains that collect or concentrate water from this area to Red Swamp Brook.
- Northeast grades lead through cleared grazing slopes to a depression between Area 1 and Area 2. This depression is not a creek or waterway and spreads across 50 hectares of land used for cropping and grazing.
- West grades lead through to another 13 hectares of moderately dense native vegetation.
- South grades flow through a band of 3-4 hectares of vegetation before moving south over 20 hectares of The Site's cropping farmland. Further south is a land

depression leading to a soak/dam in the southwest corner where water will be extracted for dust control purposes.

Extraction Area 2 falls in all directions, being atop of a narrow hill:

- East grades flow over 50 hectares of cropping land.
- South grades flow south and east into The Site towards the existing southwest corner dam and the large open depression between the two extraction areas.
- West grades flow over grazing land to the west boundary. Neighbouring land is also farmland.

Refer to Stormwater Overland Flow Diagram found at Appendix 2A which illustrates the above.

Creeks and Drains

There are no existing forced stormwater catchment structures, either natural or artificial, other than the central gravel track which generally follows the depression between the two gravel extraction areas. Therefore, should proposed activities not create concentrations of stormwater (unless detained), stormwater overland flow does not adversely affect the existing surface.

The mid and southern land depressions are over 1km from Red Swamp Brook. Southern falls lead to the dam and soak in the southwest corner of The Site.

Topsoil

Proposed extraction areas are either devoid of topsoil (where rock is exposed at the surface) or have a thin layer of topsoil (50mm to 100mm thick). Topsoil shall be salvaged and replaced as part of the staged rehabilitation of the extractive works. Rehabilitation is discussed in further detail below.

The topography and dense soil nature means that infiltration of stormwater is minimal. This is evidenced by the nature of existing vegetation being predominantly large trees. Therefore, heavy rain events will quickly surpass underground catchment and movement to flow overland in the directions detailed above. There is no evidence of water concentration, scoured drains or other similar impacts.

Infiltrated water flow will move generally in the same direction with underlying clay soils being less permeable and forcing water to move along the direction of the contours. Movement of water below the surface is not affected by the proposed extraction activities as they are proposed well above levels of water found at the southwest dam and Red Swamp Brook.

Red Swamp Brook is far enough and obscured enough by topography and vegetation to not be affected.

Vegetation

Vegetation has historically been cleared and The Site used for cropping and grazing. Some selective clumps of native vegetation remain and surround extraction Area 1. Stormwater is allowed to move without restriction along contours until sufficiently infiltrated.

3.3.2 POST-DEVELOPMENT IMPACT

Proposed extractive industry will not vary the general direction of overland flow as described above. Contours will still fall in the same direction post development.

The following events occurring during extractive industry may affect stormwater flow:

- Infiltration rates will be reduced in areas where topsoil is removed (albeit minimal) until rehabilitation is undertaken.
- Clearing will reduce natural consumption of infiltrated water, although rehabilitation increase in vegetation shall consume more.
- Earthmoving may cause concentrations of water flow at depression, leading to water channels that collect water and allow it to flow at speed outside of the works area causing scouring.
- Water shall be taken from the soak/dam in the southwest corner for the purposes of dust control.
- Water flow off areas being mined will contain elevated levels of sediments.

The following events occurring after completion of extractive industry may affect stormwater flow:

- Changes to ground levels altering catchment and flow direction.
- Loose soil replaced over the surface being subject to erosion.
- Removal of mature trees (few) and addition of mass revegetation seedlings (many) will alter soil stabilisation and natural water take-up.

Section 3.4 prescribes the management roles and control measures to be implemented to overcome any of the above factors.

It is anticipated that the pre and post development flow and water movement will be similar. That includes: direction of flow, infiltration rates and outcome. The primary change in water shall be from the increase in vegetation as a result of implementing the revegetation plan; to the satisfaction of the local authority environmental officer.

3.4 STORMWATER MANAGEMENT

3.4.1 GENERAL

Mitigating the negative effects of stormwater in bulk-earthworks type of activity is largely a product of site surface management. This includes:

- Care with regards to removing and replacing topsoil;
- Shaping site levels to avoid water ponding;
- Controlling water runoff and concentration; and

- Attenuating water to allow for nutrient and sediment stripping.

The proposed extractive industry seeks to earthwork specific areas of The Site in a staged manner. That being, smaller segments of gravel extraction shall occur at any one time. There are many social, economic and environmental reasons for this (as discussed in the proponent's extractive industry application). Staged works areas also affect the Stormwater Management planning and control.

There are six staged plans over 42 hectares. Stage 1A is 8 hectares.

The principles, directions and recommendations for stormwater management apply to each and every stage, although exact site directions will vary and are part of day-to-day site management responsibility.

3.4.2 WATER ATTENUATION AND SCOUR PROTECTION

Stormwater events which surpass infiltration, create overland flow. Overland water flow can create environmental issues where water is concentrated (or, channelled) and allowed to build up volume and speed. The effects are that scouring can occur which cause erosion, and vegetation destruction while also carrying sediments (and their attached nutrients) farther from their source.

Water attenuation principles are used to temporarily catch and control stormwater overland flow. After attenuation, water movement is controlled through dispersing, increasing infiltration and retarding flow - all of which help to alleviate the above-mentioned effects.

As soil scouring is a product of water flow not be attenuated, the stormwater management processes for scour protection is satisfied by stormwater attenuation practices described herewith.

Extractive industry will vary The Site as soil and rock is excavated from the surface to varying depths. Even slight changes to the surface can create grades that channel stormwater. Although the general direction will not vary from pre-existing, water channelling is a marked change which can easily occur. Water ponding also leads to channelling where overflow creates an artificial 'weir'.

Water channelling within areas of extraction are not of impact to the greater environment and are managed by earthmoving on a day-to-day basis.

Where water is allowed to flow off the works area and forms (or is expected to form) a channel, the following water movement control measures shall be implemented:

a) Localised earthworks to dam and direct water moving off site to a sediment trap; termed 'cut off drains'.

b) Hay-bale (or other similar) screen interface between channels and dispersed overland flow; termed a 'hay bale sediment trap'.

Cut off drains shall be used to direct stormwater where sediment or scouring within the extraction area is considerable and concentrated, thereby needing control to deflect water to a sediment trap.

The hay bale sediment trap has a three-fold purpose:

(1) To temporarily attenuate stormwater overland flow by acting as a seeping dam.

(2) To catch sediment by attenuating water and allowing settlement.

(3) To release stormwater in a slow and controlled manner after seeping through the permeable hay bales. Downstream of which, natural landforms and contours disperse stormwater as occurring pre-development.

Refer to diagrammatic illustration of the hay bale sediment trap found at Appendix 2B. The use of rip-rap (unmortared stone-pitching) and screening fabrics can also be used in lieu of hay bales if monitored to ensure that those alternatives achieve the same water control effects.

As necessary, and where required, either along the perimeter of the works area, or further down hill, additional hay bale sediment traps shall be constructed to encourage ground infiltration and discourage scouring. Hay bales eventually break-down after a few years and once rehabilitation has stabilised The Site, are no longer necessary.

Non-channelled water, similar to pre-existing overland flow events, shall not be attenuated. Natural infiltration and sediment capture shall sufficiently disperse either over the cleared farmland or clumps of remnant vegetation while still contained within The Site.

The planning and use of hay bale sediment traps are an on-site day-to-day direction undertaken by The Site supervisor who is to be provided a copy of the Stormwater Management Plan. Their use shall also apply to rehabilitated areas with which localised scouring may reoccur.

3.4.3 SURFACE STABILISATION

Stabilisation of the surface is undertaken as part of the Dust Management Plan and primarily involves the application of water drawn from a soak and sprayed over the affected area. However, stabilisation is also necessary for protection of rehabilitated surfaces

Salvaged topsoil is respread over areas of extraction after completion of staged works. Loose topsoil contains endemic seeds which germinate to stabilise the topsoil within weeks and months (depending on the season). However, significant rainfall can cause abnormal scouring of loose soil, preventing effective rehabilitation and carrying topsoil downhill.

To mitigate the potential for topsoil scouring the following actions shall be undertaken during rehabilitation:

(1) Topsoil shall be lightly compacted with a roller or other suitable heavy equipment.

(2) Rehabilitation shall occur during seasonal periods where germination is anticipated (winter-spring).

(3) Rehabilitation shall include germination of seeds contained naturally in salvaged topsoil, plus the application of seeds by hydromulching or dry seeding if necessary to form a thicker grass and root mass.

(4) The Revegetation management plan shall include the following criteria:

- Planting to occur winter through mid spring to improve percentage of new plant establishment.
- Planting to be native endemic species of a random and mixed variety. All species of vegetation shall be presented to Shire of Mundaring Environmental Officer for acceptance and compliance with current species list for the area where The Site resides.
- Planting to be in clumps of mixed species to represent pre-clearing and adjacent uncleared vegetation areas.
- Planting to be concentrated on the perimeter of works area to promote reintroduction of native fauna as well as the rehabilitation and stabilisation of batters formed by earthworks.
- Planting to be secondarily concentrated in clumps within the rehabilitation areas to avoid excessively large open and bare areas, or sparse, formal type revegetation layouts.
- Guidelines for planting tree farms adopt a 'valley to valley' approach rather than 'ridge to ridge'. Therefore, planting at the perimeter of the rehabilitation shall be in a 'valley-to-valley' method.
- Staging of extraction and rehabilitation will permit revegetation of completed areas as soon as practical to promote early regrowth while subsequent states are under operation.

The re-introduction of endemic vegetation to areas historically cleared for agricultural uses, will, by its nature, consume more water – particularly in the long term. The increase in vegetation complies with the regulatory authorities goal for rehabilitation of extractive industry, however that increase in vegetation at higher contours, shall consume stormwater previously destined to travel overland and underground to Red Swamp Brook and the soak in the southwest corner of The Site. Nonetheless, it is expected that the pre-farm clearing densities of vegetation is a preferable outcome for the rehabilitation

3.4.4 REHABILITATION CONTOURING

Planning rehabilitation of completed stages of extractive industry shall include the on-site direction for contouring affected surfaces to maintain general directional fall and eliminate areas where water can pond or concentrate flow. Earth working machines employed on site for extractive industry can be used to form gentle slopes and remove abrupt deviations in the surface before replacement of topsoil.

In preparing subsequent stages of extractive industry, soil not suitable for extraction (termed 'overburden') can be transplanted to areas being rehabilitated and needing localised filing and shaping to achieve this outcome.

3.4.5 MONITORING

Ongoing monitoring of The Site is paramount to ensuring both the success of rehabilitation and controlling water movement on current and completed stages. Rehabilitation is directly related to the success in controlling stormwater overland flow and preventing scouring.

Therefore, on site management shall:

(1) Undertake regular inspections of the extractive industry works area to identify potential points of water concentration and scouring; and implement measures as necessary;

(2) Undertake seasonal inspection of rehabilitated areas to determine the success of surface stabilisation and if further water control measures need to be implemented. These inspections apply during and immediately after significant rainfall events.

4 REHABILITATION & VEGETATION MANAGEMENT PLAN

4.1 BACKGROUND

Proposed Extractive Industry activities are of an earthworks nature, which is recognised as a ground-disturbing operation that impacts the in-situ soil and vegetation. Therefore, an appropriate management plan for the rehabilitation and revegetation of The Site is necessary to minimise the long-term environmental impact of the proposed activity.

The existing nature of The Site is thoroughly addressed in the proponents Extractive Industry application, however a synopsis of pre-existing conditions that are relevant to this Revegetation Management Plan are:

- The majority of The Site has been historically cleared for general farm use. Some large clusters of natural vegetation, in the form of mature trees and shrubs, are found in various locations. Other isolated trees are located sporadically elsewhere. The location of the proposed extractive industry is defined to deliberately avoid nearby remnant clumps of dense vegetation and area of environmental significance (refer to Site Plan found at Appendix 3A).

- The topography is generally gentle with relativity flat to moderate grades which elevate the land from approximately RL 265 AHD to RL 338 AHD. The land form rises in the south, west and east and is divided by Red Swamp Brook running southeast to northwest through the northern central portion of the property. The Site is not considered at risk of flooding. Red Swamp Brook is recognised as a constrained area and this feature is therefore protected by the prescriptions of the development application. The areas of proposed extractive industry are no closer than 700m from Red Swamp Brook and are unlikely to be of any impact.

- The Site has been soil mapped and is generally described as being in the Wundowie Soil System which is recognized in the Avon Sub Regional Strategy as having a low capability for agricultural use. Specific locations of gravel extraction undertaken with the granting of an Extractive Industry Licence are restricted to those areas of cleared land comprising of suitable gravel soils.

4.2 PURPOSE

The proponent's application for an Extractive Industry Licence has investigated The Site conditions and constraints, the staged nature of the works and needs for site revegetation. Including:

- Existing vegetation and land use;
- Topography;
- Topsoil, both as salvage and reuse;
- Contouring;
- Revegetation;
- Staged rehabilitation;

This Revegetation Management Plan discussed those aspects and documents implementation plans to be adhered to.

4.3 AUTHORITY REQUIREMENTS (*Visual Landscape Planning in Western Australia* manual)

The Shire of Mundaring Planning Officer has request the Revegetation Management Plan to reference the authority of *Visual Landscape Planning in Western Australia* manual.

That manual briefly refers to the scope of works found within this application under its *Part 3 Rural Uses, w*hich states:

> *"The term 'rural' is used in the guideline to refer to non-urban landscapes that have been substantially modified, generally by clearing."*

The Site has been historically cleared and perpetually used for agricultural use (cropping and grazing). Pockets of remnant vegetation are present. The proposed area for extractive industry are primarily cleared with either a small pocket or isolated trees to be felled to complete an area.

It continues:

> *"The rural land uses addressed in this guideline were chosen on the basis that their landscape impacts are currently of concern to the community. For this reason, some important rural uses, such as grain crops or grazing, are not discussed. Discussion focuses broadly on generic principles that address protection of rural character, remnant vegetation and /or clearing, revegetation and rural roads. In more detail this guideline addresses rural residential issues and plantations."*

The proposed development is therefore not specifically covered in the guideline. This is because:

a) important rural uses have pre-developed The Site, including mass clearing of vegetation;

b) the rural character is only temporarily affected and predominantly blocked from view of dwellings and nearby roads;

c) very little clearing is required while significant pockets of remnant vegetation and the majority of The Site are left undisturbed;

d) internal roadways are already constructed and used for current rural pursuits;

e) the revegetation plan *increases* the quantum of native vegetation by planting endemic species where there were none pre-development;

The Planning document also states:

> *"Visual impact assessments should be undertaken for proposals with potential to affect rural landscapes such as:*
> - *rural residential subdivisions;*
> - *remnant vegetation clearing, revegetation, and farm forestry, including plantations;*
> - *major tourism developments*
> - *new roads or major changes to character of existing roads with scenic value, and*
> - *windfarms and other utilities"*

None of the above criteria are applicable while proposed clearing is of a very minor amount of vegetation.

As detailed in the rehabilitation and revegetation points of this management plan, post-development rehabilitation will markedly increase the quantum and area of native vegetation than exists pre-development; which is almost none.

4.4 STAGED EXTRACTIVE INDUSTRY AND PROGRESSIVE REHABILITATION

The proposed extractive industry is undertaken in a 'staged' methodology. That being, progressive portions of the gravel pit are worked with commissioning, activity and subsequent rehabilitation limited to smaller parcels of land. In this way a number of important criteria are achieved, including:

- Limit the footprint of the extraction operation to mitigate any nuisance, environmental, safety or amenity impact;
- Maintain general site appearance;
- Reduce the demands for dust-control, safety, or other site management factors which increase proportionally with the size of the works area;
- Progressively rehabilitate land as soon as possible to promote reintroduction of fauna and flora;

4.4.1 PROGRESSIVE PROCESSES

A summary of the on-site processes detailed in the proponents extractive industry application are as follows. These steps apply to every stage as the extractive industry commence and closes on each progressive stage:

(1) Identification – survey undertaken to identify the limit of works, boundaries, reference levels and vegetation to be protected.

(2) Clearing – Vegetation to be removed is felled and stockpiled for removal.

(3) Stripping Topsoil – topsoil of varying thickness, but an average of less than 50mm, is collected from the surface and stockpiled nearby to an average height of 1-1.5m and in a manner that permits efficient dust control.

(4) Gravel extraction – selective excavation, processing and stockpiling of gravel resource.

(5) Rehabilitation and Topsoil replacement – contouring final levels to suit revegetation needs and spreading of topsoil over extractive footprint.

(6) Revegetation – Seeding and planting of native grasses, trees and shrubs.

4.4.2 STAGING AREAS

The proposed extractive industry is located in two areas most suited for gravel. Area 1 is located on the hilltop towards the south of The Site. Area 2 is located on the hilltop on The Sites west side. Each has an approximate area of 20 hectares.

Each area is proposed to be mined in 3 stages. The stages movement is to allow for rehabilitation of previous stages to better conceal works from Toodyay Road and semi-rural residences north of the property (approx 1 to 1.5 kilometres away).

Stage 1A is approximately 8 hectares, needs the removal of 6 mature trees and will yield approximately 3,000 cubic metres of topsoil. Refer to Staging plans found at Appendix 3A for diagrammatic images.

4.5 REHABILITATION AND REVEGETATION

4.5.1 OBJECTIVE

Post extractive industry rehabilitation is important to the proponent who houses a 'better-than-found' philosophy for their projects - whether in primary production, organic farming or land development. Through commitment to a rehabilitation program and responsible environmental management, The Site is preserved after below-ground resources are extracted so that the future development potential of The Site is not compromised.

Recognised as an existing natural resource and an agricultural resource, The Site needs to continue to compliment both when rehabilitation occurs to areas disturbed by extractive operation. This primarily applies to the surface of The Site (landform and topsoil) and vegetation thereon.

Rehabilitation and revegetation is beneficial. Its goal is to create as close to a pre-existing state as possible with an effort to *improve* environmental causes, including:

- Encouraging the expansion of native fauna and flora to rehabilitated areas;
- Establishing greater vegetation replacement to benefit environmental concerns, aesthetic views, soil improvement, erosion protection, salinity control, and many other such benefits;

The rehabilitation methodology demonstrates that these goals are practical and likely to be achieved.

The intensity of rehabilitation and revegetation is a product of how The Site exists pre-development. Site descriptions above identify the works area as having undulating topography and being already historically cleared. Therefore, the demands on rehabilitation and revegetation are not onerous.

A summary of Rehabilitation and Revegetation processes is provided at Appendix 3Cwhich details activity versus time. That *Rehabilitation Planner* also identifies the *Species List* of suitable and approved trees and shrubs.

4.5.2 REHABILITATION METHODOLOGY

As detailed above, rehabilitation shall be undertaken in a progressive manner. This shall minimise the physical works area at any one time. A reduction of working area will mitigate visual impact, environmental impact, dust lift-off, stormwater runoff and sediment stripping, use of watercarts and other whole-of-site management. Further, staged rehabilitation introduces fauna and flora faster, allowing establishment to take place sooner.

Gravel extraction will start at the northern part of Area 1 and move south at a depth determined by the suitability of gravel encountered. To permit staging of works and as-soon-as-possible rehabilitation, economical-sized areas are defined for staged activity. Area 2 will be mined only after completion of Area 1.

4.5.3 REHABILITATION AND REVEGETATION PROCESSES

In a step-by-step process, the following shall be implemented to perform the objectives of the Revegetation Management Plan:

4.5.3.1 Batters and Landform

The Site will be rehabilitated as gravel excavation progresses through each phase. As gravel has been extracted from The Site, the landscape will be on a lower level than it was previously. Raw gravel extraction may create steep slopes which can be both unsafe and unsuitable to effectively rehabilitate.

The perimeter of completed extractive operations areas will be battered to best match the surrounding natural landform. Grading and flattening batters to blend natural and artificial levels will be undertaken site specific - considering the impact of expanding ground disturbing activity outside of the gravel pit footprint. A 1:4 batter is sought as a rule-of-thumb, but existing vegetation and undulating contours will determine final grades.

Topsoil and vegetation can establish easier on flatter surfaces. Steeper grades can be both unsafe and prone to stormwater scouring, particularly when rehabilitated with loose topsoil. Scouring then carries away or destroys seeds and seedlings. Therefore, as reasonable as possible, and without increasing the environmental impact, grades shall be blended as shallowly as possible prior to respreading topsoil or revegetation. Assisting the regrowth of flora in this way will, in turn, stabilise banks and batters more efficiently.

Refer to Revegetation Cross-Section Plans found at Appendix 3B for diagrammatic representation of the above.

4.5.3.2 Topsoil

As discussed above in the works methodology, topsoil shall be conserved. Prior to excavation of staged extractive industry areas, topsoil is scraped off the surface to a depth which can be identified as soil suitable for rehabilitation. That thickness varies but is non-existent where rock is on the surface and elsewhere is nominally less then 100mm thick. Topsoil is stockpiled adjacent the works area where any seeds are kept in the soil and grasses are able to naturally break down and increase the soil health.

Topsoil bunds are not to exceed 1.5m in height which will mitigate the potential of wind-borne dust lift off. They shall also be shaped to allow for trafficking by watercarts to apply water should manual dust control methods be necessary.

After gravel extraction and reforming The Site to blend into the surrounding area, topsoil is evenly respread over the surface and lightly compacted. Seasonally adjusted, water is applied to assist in crusting the surface to prevent wind-borne dust lift-off.

Revegetation shall occur as soon as possible after topsoil respreading to encourage stabilisation of topsoil. Direct seeding will be undertaken over-and-above revegetation to stabilise topsoil quickly, particularity on batters subject to erosion.

As works are progressive, The Site is easier to manage for rehabilitation success. Topsoil affected by scouring can be restored with other operations occurring on site as they are encountered.

4.5.3.3 Revegetation

Revegetation of each stage will take place when it is most practical and will enhance the chances of success of plant re-colonisation. Landform rehabilitation will occur before revegetation commences. This includes placing topsoil over disturbed areas to generate a suitable medium for plant regrowth. Only plant species endemic to the area will be planted.

Grasses and Seeding

Where insufficient natural grasses regrowth is expected from respread topsoil, select grass species suitable for low ground cover shall be seeded. Applied by direct seeding (preferred) or hydromulching, seed shall be sown in winter-early spring to permit germination and root development with natural seasonal rainfall.

All species of vegetation shall be presented to Shire of Mundaring Environmental Officer for acceptance and compliance with current species list for the area where The Site resides.

Trees and Shrubs

Guidelines for tree and shrub revegetation shall apply to recreate an environment better suited to native flora and to encourage re-introduction of native fauna. Those 'criteria' include:

a) Planting to occur winter through mid spring to improve percentage of new plant establishment.

b) Planting to be native endemic species of a random and mixed variety. All species of vegetation shall be presented to Shire of Mundaring Environmental Officer for acceptance and compliance with current species list for the area where The Site resides.

c) Planting to be in clumps of mixed species to represent pre-clearing and adjacent uncleared vegetation areas.

d) Planting to be concentrated on the perimeter of works area to promote reintroduction of native fauna as well as the rehabilitation and stabilisation of batters formed by earthworks.

e) Planting to be secondarily concentrated in clumps within the rehabilitation areas to avoid excessively large open and bare areas, or sparse, formal type revegetation layouts.

f) Guidelines for planting tree farms adopt a 'valley to valley' approach rather than 'ridge to ridge'. Therefore, planting at the perimeter of the rehabilitation shall be in a 'valley-to-valley' method.

g) Staging of extraction and rehabilitation will permit revegetation of completed areas as soon as practical to promote early regrowth while subsequent states are under operation.

Diagrammatic cross-sections illustrating the above criteria are found at Appendix 3B.

As the pre-existing vegetation quantities are almost non-existent, the quantity of planted trees and shrubs will be vastly greater than what is removed. Even applying a 10 to 1 replacement, plus 20% for possible fall-over, the number of trees is few. For example, Stage 1A would see less than 100 trees to replace the 6 trees removed.

Alternatively, the above-mentioned revegetation guidelines lead to quantities based on identifying favourable locations for clumps of trees each planted with dozens of trees and shrubs. The illustrative example for Stage 1A found at Appendix 3A identifies 3 large, informal clumps to be planted, each spread over approximately 1 hectare and containing up to 1000 trees (a rule-of-thumb for density being one plant per five square meters).

Ripping and mounding is not required because the surface shall already be loosed from the contouring and topsoil earth working of the area.

Where possible, planting shall occur in the first autumn/winter season following landform, rehabilitation to increase the survival success rate. It is important not to delay seeding and replanting for longer than one year after topsoil has been added as the soil can become compacted which makes it harder for seeds and plants to survive. It is also important to start seeding and replanting after the first rains of winter season to allow the soil to become moist. This places less stress on plants and ultimately leads to greater survival rate and greater revegetation success.

Preferably, seeding and planting will occur progressively as each stage of The Site is rehabilitated after gravel excavation. However, due to the nature of mining activities, there might be some deviation from this timeline. As the next stage of mining will occur very close to rehabilitation and revegetated area, this might cause some disturbance and hinder the success of plant regrowth. Therefore, some degree of discretion will be required when determining when to commence revegetation in order to help increase survival rates.

Weeds (plant species that are not endemic to the area) can have a significant impact on revegetation of endemic species if inappropriately managed. The presence of weeds should be identified through monitoring efforts and will be controlled through selective herbicides such as Roundup or controlled manually if possible. It is also important to ensure that the plants and soil bought into The Site are not infected with *Phytophthora cinnamomi,* commonly called 'jarrah dieback'.

4.5.3.4 Monitoring and Maintenance

The purpose of monitoring is to assist the success of rehabilitation and revegetation efforts and to determine whether certain objectives have been achieved. It can also indicate whether the revegetation plan requires modification to help reach this goal more efficiently. In this case, the ultimate goal of rehabilitation and revegetation is to return the vegetation of The Site to a self sustaining, pre-mining state (i.e. to a similar species composition and greater density). It is important to note that this state differs from the pre-clearing or pre-farming state. Monitoring the species composition and density of the vegetation on The Site will help indicate whether this goal has been reached.

In general, monitoring involves measures specific quantities and qualities of vegetation. In this case, the species composition and density will be monitored. Monitoring will be conducted at regular intervals (approximately every six months) over three years in order to obtain appropriate amounts of information. This will help detect any negative changes or issues, which can be attended to and rectified as soon as possible.

Weed monitoring involves assessing the amount of exotic species present in an area. Depending on the results found, eradication measures will be employed in order to remove as many weeds as possible to increase the success of native vegetation regrowth. Weed monitoring is more important when the ultimate goal of revegetation is to return The Site to a natural state. Therefore, it is impractical to attempt to destroy all weeds on site. However, due to the extremely destructive nature of certain weeds and their tendency to spread fast and efficiently, it is important to monitor whether potent weeds are present and spreading so appropriate action can take place to hinder their growth. In this situation, native and exotic species will be monitored simultaneously to improve efficiency.

A simple monitoring exercise will be performed to determine the species composition and density. This involves setting up approximately ten 'quadrants' measuring 5m by 5m in randomly selected locations around The Site. The different species in each quadrant will be identified and the number of plants of each species should be recorded. The density of each species can be analysed over time in order to determine the growth or death rate. Relevant actions such as replanting or weed eradication will be undertaken if the information obtained is unfavourable. Monitoring will take place approximately every six months to obtain information for comparison.

It can take a few years for native species to re-establish in an area after rehabilitation has commenced. Therefore, monitoring will be conducted for three years following the rehabilitation and revegetation of each stage. This should be sufficient time to indicate whether the rehabilitation goals have been met.

The results of the revegetation monitoring shall be made available to the local authority Environmental Officer as part of a project close-out report.

5 NOISE & AMENITY MANAGEMENT PLAN

5.1 BACKGROUND

Proposed Extractive Industry activities are of an earthworks nature and require the use of heavy civil machinery and trucks that increases the risk of creating noise nuisance.

The proponent's application for an Extractive Industry Licence has investigated the risks, potential nuisance, mitigating factors and likely impact of the operation on the surrounding environment, including that of noise. In brief, the proposed area of activity is:

- isolated and far from dwellings, the nearest being approximately one kilometre away [Buffer Distance];
- hidden from adjacent land holdings', dwellings' and thoroughfares' line-of-site by undulating land topography and existing vegetation [Visual Impairment];
- moderately screened from prevailing winds by existing dense clumps of natural (and tall) vegetation, which are to be protected [Natural Protection];

Noise pollution is produced by the operation of extractive industry equipment. Trucks, earthmoving plant and crushing/screening plant all are power motorised items which create noise which can escape off The Site. DEC guidelines prescribe permissible noise pollution which is to be managed in accordance with this Noise Management Plan.

5.2 PURPOSE

The purpose of this Noise Management Plan is to identify potential noise nuisance and prescribe measures to mitigate the impact of that nuisance on noise-sensitive premises.

Noise producing activities are limited to the operation of vehicle and machine engines. Blasting and drilling, which are significant noise activities, are not proposed.

5.3 AUTHORITY REQUIREMENTS

Environmental Protection (Noise) Regulations 1997 prescribe the general rules to control noise and what is and is not permitted. Investigation of The Site and the proposed activity are to demonstrate compliance, or if not, how impact will be mitigated.

Further, *Environmental Protection Agency Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses* more specifically address noise nuisance from extractive industry for which the proponents have applied.

Section 5.4.5 below reviews these authority requirements and how compliance shall be met.

5.4 NOISE MANAGEMENT

5.4.1 NOISE SOURCES

Extractive Industry can cause noise pollution from the following processes:

- Engine noise from plant and equipment;
- Processing noise from crushing;
- Engine noise from soil transport vehicles removing material off The Site;
- Explosive noise from blasting;
- Vibratory noise and sensation from tracking and compacting;

Noise (and vibration) must be managed to prevent influence off The Site, particularly to any adjacent dwellings or places of business.

5.4.2 NATURAL NOISE BARRIERS

Noise impact is prejudiced by distance and line-of-sight.

The proximity to dwellings has been examined to determine line-of-site and any possible adverse noise impact. Topography and existing vegetation in the form of large, dense clumps naturally create significant screening from noise, dust and visual pollution between the areas of proposed extractive industry and dwellings nearby.

Landform topography prevents line-of-site from the proposed gravel pit Area 1 to any dwellings near The Site, which are all greater than one kilometre away. Some roof-tops are visible two kilometres north of the Area 1, but are nestled in dense tree-scapes. Area 2 is also located on a hill-top and has some line-of-site view to dwellings northwest approximately one and a half kilometres away. Refer to Viewscape Plans and on-site photography images found at Appendix 4A which demonstrate the natural physical screening.

Distance, obscured land form and dense vegetation (primarily large trees) at various intermissions over more than one kilometre conclude that noises impact would be minimal if at all detectable. Buffer distances and recommendations for acoustic impact studies are discussed in greater detail in Section 5.4.5 below; of which the EPA guidelines are satisfied simply from the physical distance from the proposed activity to noise sensitive premises.

Wind can be a cause for carrying noise greater distances than expected, or conversely able to disperse noise away. With noise sensitive premises located north of the proposed Extractive Industry and analysis of Wind Rose data has yielded the following conclusions:

- During wetter months wind direction in a northerly direction is encountered much less frequently than any other direction and any other time.

- During drier months, wind is encountered more regularly and at a greater speed than wetter months, however the wind direction is predominantly south, southwest and west in the morning and across the southern part of the dial in the afternoon.

Therefore, a *Wind-Rose* analysis demonstrates that impact to dust sensitive premises is low and often reduced by the prevailing winds. See Wind Rose Data found at Appendix 1D

Although not a natural noise barrier, the existing traffic on Toodyay Road created an ambient background noise which pre-exists and already impacts on noise-sensitive premises near The Site. Being a heavy haulage truck route with over 3,000 vpd, affected residences live with a reasonably high traffic noise; creating a background noise far surpassing potential noise from the proposed extractive industry, and also desensitising its effect.

The following traffic study is excerpted from the proponents' Extractive Industry application:

> "Trucks accessing The Site and carting material off The Site shall travel via Toodyay Road. This is a recognised heavy haulage route which is already under significant truck traffic loads. MRWA published data for Toodyay Road adjacent The Site has an average traffic count of 2,930 vpd (2004/2005). The traffic count of Toodyay Road increases to 6,110 vpd through Stoneville and 19,220 vpd through Jane Brook - which is the vehicle route for trucks carting extracted material to the Perth metropolitan region. The representation of increase to traffic count on Toodyay Road, which is already recognised as a dedicated heavy haulage road, is approximately 1.5% and considered an insignificant increase. Haulage vehicles, as they enter more populated areas south of Jane Brook, increases that respective vehicle count by only 0.25%. Therefore, although there are additional trucks, the nett increase in noise is not significant above existing impact to those dwellings near Toodyay Road."

No adverse noise impact on nearby dwellings is anticipated.

5.4.3 NOISE MITIGATION AND MANAGEMENT

The Site is already well protected from creating noise pollution from natural features. However, operational processes and management of the extractive industry can further reduce any adverse noise impact.

Gravel processing will be undertaken in designated areas with the greatest natural protection from winds (concealed at lower contours and nestled near dense vegetation) which simultaneously minimise wind-borne dust pollution and dissipate noise pollution. They shall also be located as close as possible to the area of extraction to minimise haulage distance – lessening truck use and therefore noise.

Gravel extraction occurs at and below natural ground level. Excavation walls will act as a noise insulator for operations in those pits, reducing the potential for noise escape from The Site.

Vehicles, plant and equipment such as generators shall only be permitted on site with appropriate sound dampening apparatus. This includes the proper use of mufflers for trucks and earthmoving plant, as well as generators and fixed plant having motors in enclosed housings - both of which are *standard* practise.

No extra physical protection requirements are necessary for noise management.

Noise levels shall comply with the *Environmental Protection (Noise) Regulations 1997*. Procedures involved in adhering to the management techniques are as follows:

(a) Adhering to the hours of normal operation, with work conducted in the hours identified in the application;

(b) All plant equipment and vehicles being fitted with appropriate noise suppression equipment to reduce noise levels so far as is practicable, with machines the quietest reasonable available;

(c) All non–conformances and noise and vibration related complaints immediately reported to the project manager;

(d) Following complaints, the source of any excessive noise or vibration will be identified and work practices will be modified or re-scheduled to reduce or eliminate the risk of future events;

The potential for noise impact on the surrounding area is also related to the level of site activity and wind direction. If wind conditions are such that they may enhance noise movement towards adjoining areas, the magnitude of extraction activities may be scaled down until such conditions change.

5.4.4 VIBRATION AND BLASTING MANAGEMENT

Large track-mounted plant, such as bulldozers, can cause nearby vibrations. Compacting equipment used for pavement construction and earthworks are also often attributed to creating vibration problems up to a few hundred meters away.

The Site has no proposed land filling needs and therefore no compacting equipment is anticipated. Heavy track-mounted earthmoving plant shall be operated, although physical distance from residences being greater than one kilometre means that vibration is extremely unlikely to be carried off The Site.

Blasting is used for some types of extractive industry when hard rock is encountered and/or mined. Laterite rock, gravel and associated soil are able to be mined without the need for blasting. No blasting is proposed. However, should blasting be a necessary change to the extractive industry activity, all necessary permits shall be sought and notifications made.

5.4.5 ACOUSTIC (BUFFER) ANALYSIS

Noise impact is referred to in *EPA Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses* which recommends a buffer distance of 'case by case' for the proposed form of Extractive Industry. Buffer distances for *Sand and Limestone* type of extraction are recommended between 300m and 500m; while distances for the most intense rock mining which requires regular blasting for all extractions, termed *hard rock Darling Scarp*, is 1,000m. The proposed activity is considered similar to limestone extraction as it uses similar type of plant and equipment.

"Sensitive" land use includes dwellings. Therefore the prescribed buffer distances have been applied to determine if noise impact is acceptable.

A recommended buffer of 500m reasonably considers the nature of the proposed works, and the topography and vegetation barriers which already exist.

A site plan which identified the 300m and 500m buffer distances is found at Appendix 4B. There are no sensitive land uses within the buffer distance up to 1,500m from Extraction Area 1 and 800m from Extraction Area 2. Therefore, the environmental impacts of the proposed Extractive Industry are considered to be adequately far away from existing sensitive land uses.

Considering the EPA guidelines, there is no reasonable requirement to undertake theoretical acoustic noise modelling.

6 WATER MONITORING MANAGEMENT PLAN

6.1 BACKGROUND

The proponent's application for an Extractive Industry DA and License has investigated the risks and perceived concerns regarding the impact on Red Swamp Brook to determine protection measures and testing regime.

Those risks, mitigation thereof and prescribed water quality test are discussed herewith.

6.2 AUTHORITY REQUIREMENTS

Department of Indigenous Affairs has acknowledged the proponents application and advised that Red Swamp Brook (a 20 metre wide strip of land containing the waterway) is a Swan River tributary and therefore a Registrar entry that requires any development over this area to seek approval from DIA.

Department of Water has acknowledged the proponents application and has not required any conditions relating to taking of water or protection measures.

Department of Environment have inherent guidelines and policies governing water bodies and contamination prevention requirements.

Shire of Mundaring Environmental Department has acknowledged that water shall not be taken by the proponent for use in the extractive industry. However, assurances of "no impact" to Red Swamp Brook have been requested to satisfy concerns of landowners downstream.

6.3 IMPACT ON RED SWAMP BROOK

The following statements of fact refer to the proposed activity and impact on Red Swamp Brook:

- The proponents' application documentation has thoroughly investigated The Site and its potential environmental impacts; including prescribing management plans as necessary. Proximity and proposed activity is found to be of no impact to Red Swamp Brook, either by traffic, dust, clearing, taking of water or by stormwater overland and subsoil flow from the proposed works area.

- Consumption of water for the works (specifically, for dust control) has been investigated. An adequate source has been identified from a local dam/soak

located within the property and supplied by a localised surficial aquifer catchment. Hydrological investigation has determined that suitable quantity is available and impact in taking that water is negligible.

- The nature of the proposed works is extraction and non-chemical processing of in-situ soil and rock. No materials, processors or other such activity is anticipated to impact on water quality for any aquifer or water feature on or near The Site.

6.4 WATER QUALITY TESTING

As specifically requested by Shire of Mundaring, water quality of Red Swamp Brook is to be habitually tested by the proponents to identify possible impact from the proposed extractive industry. Water testing results shall be provided to Shire of Mundaring Environmental Department.

6.4.1 Testing Regime

Testing regime shall be formed from the following:

- A 'control' sample taken prior to commencing ground disturbing activities.
- Tests undertaken annually (during July when water is sufficiently flowing).
- Two samples taken from Red Swamp Brook for quality comparison of water entering and leaving The Site (Refer site plan found at Appendix 5A)

6.4.2 Qualitative Criteria

Water quality shall be determined by the following parameters:

- Acidity (pH);
- Electrical Conductivity (EC);
- Nutrients (Ammonia and Nitrate levels, Total Phosphorous, Total nitrogen);
- Suite of Metals (Aluminium, Iron, Copper, Cadmium, Chromium, Nickel and Lead);

6.4.3 Comparative Analysis and Triggering Event

An analysis of water tests results shall be made as follows:

- Comparison between water sample entering and leaving site.
- Comparison with control sample.
- Comparison with historical records
- Comparison to DEC water contamination guidelines

Rainfall over surface catchments and concentrations into water bodies such as creeks can markedly impact the validity of water analysis and comparison. The inflow of stormwater can significantly increase freshness and reduce concentrations of contaminants. Therefore

two criteria shall be adopted for triggering an event where water analysis shall be considered significant enough to requiring further investigation and/or action:

(a) A change of 25% in qualitative criteria (as recommended by *Department of Agriculture* as a triggering event).

(b) Contamination levels above DEC guidelines.

6.4.4 Contamination Action Plan

Should water quality tests trigger a contamination event, the proponents shall engage a suitably qualified water consultant to investigate The Site, the activity and all potential impacts on Red Swamp Brook so that a contamination action plan can be implemented.

The consultant shall be required to advise the proponents, and the proponent shall undertake thereof appropriate action. That shall include where applicable:

- immediate measures to contain any contamination;
- immediate measure to prevent further contamination;
- remediation measures;
- ongoing changes or action to site activity to prevent re-occurrence;
- monthly investigation to ensure contamination causes by extractive industry have been eradicated;

Water resting and Action Plan are summarised in the table found at Appendix 5B.

7 COMPLAINTS PROCEDURE

Complaints from approved extractive industry generally apply to the escape of noise and dust pollution. Odour pollution is not a product of mining gravel.

Complaints made to the operator/licencee will be documented and dealt with expeditiously.

Complaints received either directly from the complainant or via the Shire of Mundaring will be reviewed by the operator and interested parties to assess:

- the legitimacy of the complaint;
- the aspects of the operation that triggered the complaint;
- management actions required to address the issues raised to bring operations into line with conditions imposed under the Extractive Industries Licence;

Actions deemed necessary to comply with relevant legislation, regulation and licence conditions will be undertaken immediately. If necessary, works will be suspended until appropriate rectification has occurred.

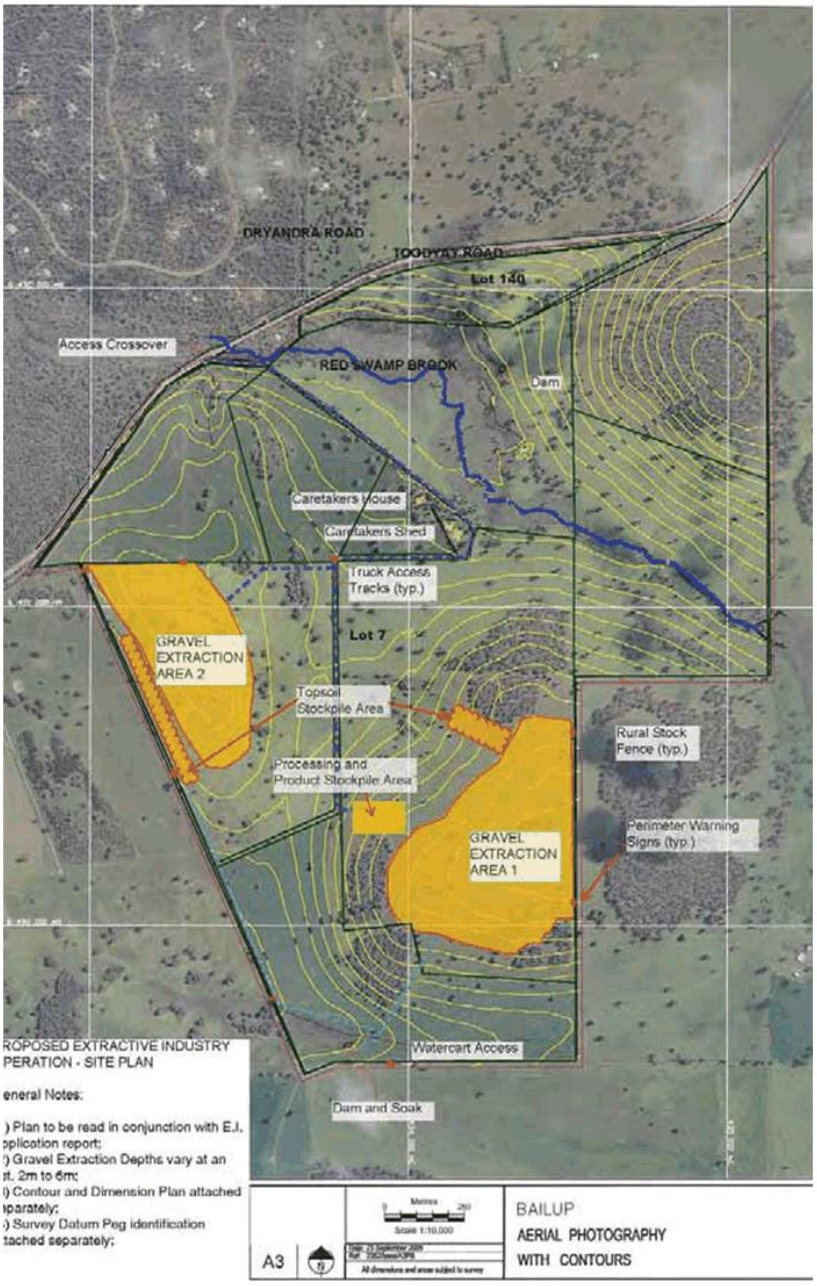
Summaries of complaints and action taken to address each specific issue will be recorded in a Complaint Report. The Complaint Report shall document the following:

a) Details of site, location, licensee and operator;
b) Time and date of complaint;
c) Details of complainant (including how complaint was made);
d) Details of complaint;
e) Licence condition(s) allegedly breached;
f) Resolution:
    - Name of person investigating on behalf of operator/licencee;
    - Details of weather conditions at time of complaint;
    - Details of site activity at time of complaint;
    - Comment as to complaint and cause;
    - Time and nature of Immediate action taken;
    - Time and nature of Follow-up action taken (if any);
    - Date and time complaint was resolved;
    - Recommended changes to operating procedures to prevent complaint recurrence;

Complainants and the Shire of Mundaring will be advised of complaint handling and resolution process, including receipt of copy of Complaint Report.

APPENDIX 1A

Location Plan including water source location and proposed water cart access routes.



APPENDIX 1B

Hydrologist's Report on Water Source Suitability.

Waterdirect Pty Ltd

25 August 2010
Project No. 00244
Ref: AB

Elswick Developments Pty Ltd
945 Abernethy Road
Oakford WA 6121

Attention: Mr Ren Lexander

Subject: Lot 7 Toodyay Road, Bailup

Dear Sir,

This letter is being written to support the sustainability for a soak/dam being used for dust suppression purposes during extractive operations at Lot 7 Toodyay Road, Bailup. The soak/dam has not been pump tested to determine inflow rates.

1. Requirements

The water requirement for the dust suppression has been estimated at 45 kilolitres (kL) per day. The water will mainly be required in the hotter months and it is anticipated that the use will be for approximately 100 days per year. The total annual water requirement for dust suppression would be in the order of 4,500kL per annum.

2. Source

The source of the dust suppression water supply is a small soak/dam located in the south-western corner of the property. The location of the soak/dam is 433820E 6489610N. The soak/dam has been constructed to enable stock to get to water without getting stuck in waterlogged ground and is approximately 20 metres long and 12 metres wide and is located on the southern side of a spring-fed water logged area. Assuming

Water Direct Pty Ltd
PO Box 3135, Perth Adelaide Terrace WA 6832
Phone: 08 9325 3966, Facsimile: 08 9325 3988
Email: rianmoore@wdl.com.au

an average depth of 1m the soak/dam would have a capacity of approximately 240kL or several days requirement

3. Topography

The property is located on the Darling Plateau which represents an ancient erosion surface that has been dissected by streams and rivers. The highest portions of the Darling Plateau consist of pisolitic laterite gravels that form flat topped hills. The two highest hills on Lot 7 consist of up to a 15m thickness of lateritic gravels with the highest having an elevation of nearly 340m AHD. The lowest portions of the property are to the north on Red Swamp Brook where the elevation drops to approximately 260m AHD.

4. Rainfall

The nearest reliable weather station is the Noble Falls (9252) that has a reliable rainfall record from 2001 to present. The average annual rainfall over this period has been approximately 745mm.

5. Geology

The tops of the hills on Lot 7 are pisolitic lateritic gravels. These are very freely draining sands and gravels and drainages are generally absent on the tops of the hills. Immediately below the lateritic gravels is a weathering lithology that is composed of clays that are nearly impervious. Underlying the laterite and clays are granitic and migmatitic rocks of Archaean age.

6. Hydrogeology

The groundwater found on the Darling Plateau is generally very shallow and referred to as surficial water. The surficial aquifers are generally small and yield limited supplies of fresh to brackish water. The aquifers consist of thin generally sub-horizontal layers of

laterite and sands or sands. At Lot 7 the aquifer supplying the soak/dam is composed of thin sands below a lateritic capping.

The groundwater that is contained in the water-logged area originally started as rainfall. A portion of the rainfall that reaches the ground may in the correct circumstances percolate into the laterite or sands and become groundwater. The rain water will travel vertically downwards through the lateritic gravels until it reaches the underlying clays which as described earlier are nearly impervious. When the groundwater reaches the underlying clays the movement changes from vertical to horizontal and the water moves towards the edges of the lateritic capping and the waterlogged area. In the vicinity of the waterlogged area the groundwater appears to reach the surface at an elevation of approximately 280m AHD. From the edges of the laterite to the soak/dam the water moves through a thin layer of sands and residual gravels that have resulted from the weathering of the lateritic cap.

If this water is not utilised it continues moving westwards down the valley and at the western end of the waterlogged area is absorbed back into the ground. There does not appear to be any significant groundwater dependent ecosystems relying on the groundwater to the west of the water logged area.

7. Source Sustainability

The amount of rainfall entering the lateritic gravels depends on the physical area of the laterite. To the east of the water logged area on Lot 7, the area that could act as the recharge area is approximately 30 hectares. If the rainfall recharge is conservatively estimated at 10% of annual average rainfall or 0.0745m then the possible recharge from Lot 7 alone would be in the order of 22,305kL per annum. The lateritic hill to the immediate south of Lot 7 would have a similar annual contribution of groundwater to the water logged area. The resultant out-flow from the base of the laterite capping would be in the order of 45,000kL per annum or ten times the water required for the dust suppression.

The clearing of the original forest from the laterite areas has resulted in an increase in the amount of rainfall recharging the aquifer. The increase has resulted in an increase in water logging in areas were groundwater reaches the surface and in some cases has

resulted in rising salinity problems. At Lot 7 it is most likely that the rainfall recharge is significantly higher than 10% which would result in a significantly higher amount of groundwater being available.

8. Contingency

Should the supply of groundwater to the soak/dam be temporarily depleted then the Extractive Industry Dust Management Plan shall prescribe alternative dust control measures until more water becomes available.

9. Conclusions

- The proposed extractive industry operation at Lot 7 Toodyay Road, Bailup, has a dust suppression water requirement estimated at 45kL per day for approximately 100 days per year or 4,500kL per annum.
- The soak/dam in the southern portion of the property has been identified as the likely source of the dust suppression water.
- The groundwater contained in the water logged area around the soak/dam is originally sourced from rainfall that falls on the lateritic gravels that form the hill tops in the Bailup area and then moves under the influence of gravity through the gravels until it reaches the underlying clays and then to the edges of the laterite cap.
- Recharge from rainfall is conservatively estimated at 10% of total rainfall. The area above the water logged area to the north, east and south has an approximate area of 60 hectares. The rainfall at the nearest rainfall recording station at Noble Falls indicates that the average rainfall is 745mm per annum. Therefore the potential recharge to the aquifer from rainfall is conservatively estimated at 45,000kL per annum.
- Should the supply of groundwater to the soak/dam be temporarily depleted then the Extractive Industry Dust Management Plan shall prescribe alternative dust control measures until more water becomes available.

10. Recommendations

The groundwater causing the waterlogged area around the soak/dam should be capable of supplying 4,500kL per annum based on the rainfall recharge calculation. However, the rate at which the soak/dam will recharge has not been tested. A shallow drain running north of the dam across the waterlogged area and connected to the soak/dam would assist in catching more of the groundwater.

We trust this information is sufficient for your immediate purposes. Please do not hesitate to call should you have any queries or require additional information.

Yours faithfully

Water Direct Pty Ltd

RIAN MOORE
Hydrogeological Project Manager

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APPENDIX 1C

Dust Suppression Matrix
Events vs. Action → Outcome table for day-to-day site management to mitigate dust

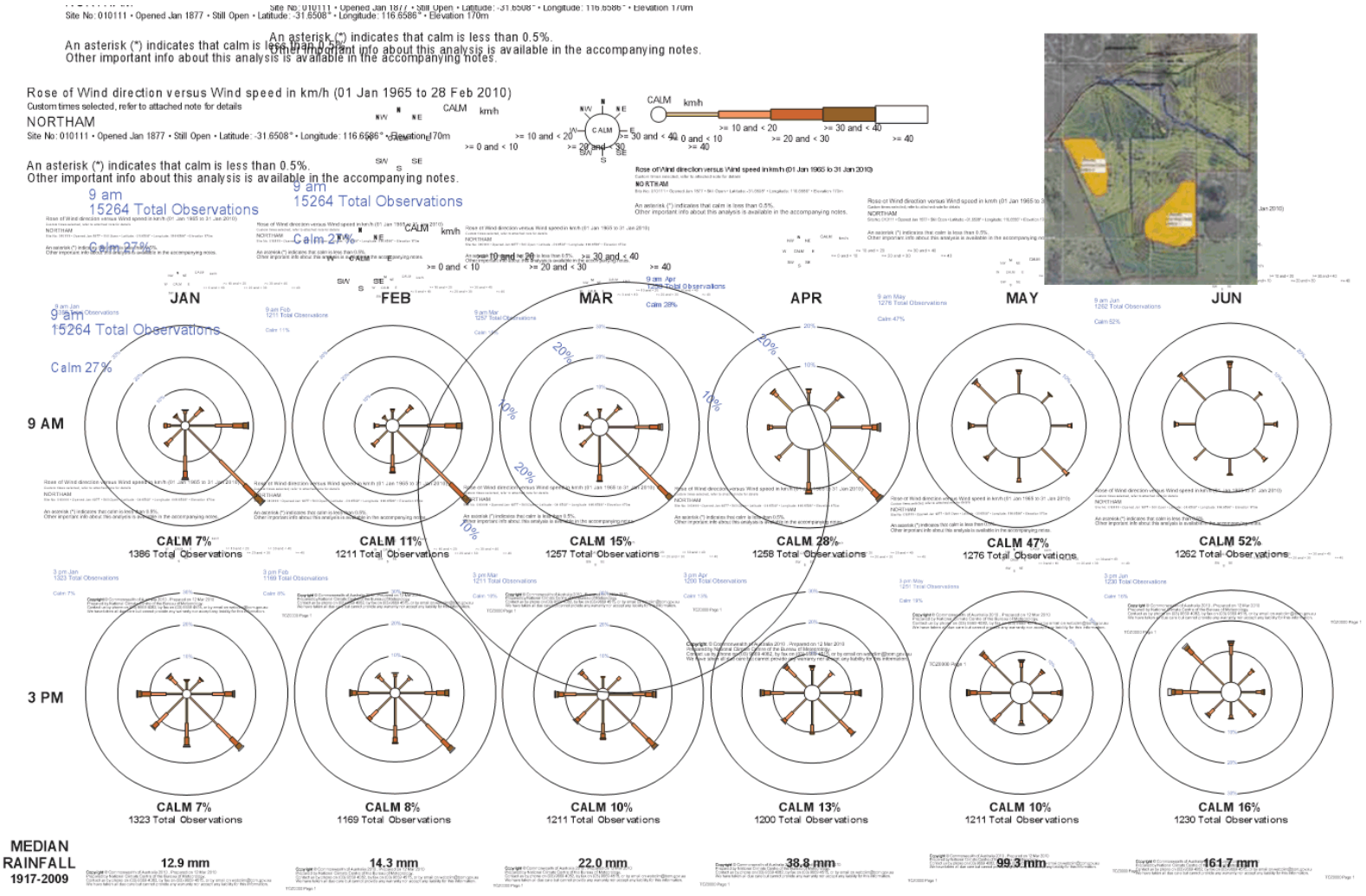
Table below details day-to-day site activities/events and required action to mitigate dust nuisance.

Site Event	Action	Outcome
(A1) Continuous – during all operation activities	▪ Daily monitoring of weather conditions, including (wind speed, wind direction, surface moisture and rain events)	Determine and prepare needs for dust suppression.
(A2) Continuous – during all operation activities	▪ On-going monitoring of gravel tracks, access to Toodyay Road, stockpiles and activity areas for dust lift-off	Determine and prepare needs for dust suppression.
(B1) Topsoil – stripping and respreading	▪ Topsoil stockpiles not to exceed 1.5m in height and located where prescribed ▪ Application of water (use of watercart)	Reduce wind impact and suppress dry surfaces
(B2) Topsoil – stockpiles	▪ Application of water to encourage germination ▪ Hydromulch surface if self-germination not effective	Topsoil to be stabilised long-term
(C1) Extractive industry – ripping and pushing up gravel	▪ Application of water to works area (use of watercart)	Stabilise exposed surfaces
(C2) Extractive industry – materials handing (hauling and stockpiling)	▪ Application of water over material being handled (use of watercart)	Wet loose gravel to reduce wind lift-off
(C3) Extractive industry – processing and crushing	▪ Application of water (use of watercart)	Wet loose gravel to reduce wind lift-off
(C4) Extractive industry – location of processing plant and stockpiles	▪ Location of plant and gravel processing to be near extraction, downhill and adjacent remnant vegetation.	Distance to haul gravel to be minimised.

		Processing to use natural protection
(D1) Transport – crossover and tracks	▪ Crossover to Toodyay Road to be upgraded and sealed for 70 meters ▪ Application of water (use of watercart) ▪ Occasional use of water additives/coagulates	Prevent dust carried off site onto Toodyay Road
(D2) Transport – trucks	▪ Trucks bodies to be covered with suitable tarpaulins	Prevent dust lift off during transport of gravel
(E1) Special – complaint regarding dust	▪ Immediate investigation and follow-up as prescribed in the Complaint Procedure	Identify cause of dust nuisance and eliminate.
(E2) Special – insufficient water volumes available at nominated soak	▪ Application made to Shire for alteration to the existing soak/dam ▪ And/or, application made to Department of Water to install a bore	Sufficient water available for dust suppression
(E3) Special – adverse weather condition where dust control measures are ineffective (very strong northerly winds, hot and dry surfaces)	▪ Temporary suspension of works	Eliminate dry, exposed surface from being disturbed and allowing dust to be carried off the site

APPENDIX 1D

BOM Data
Rose of Wind Direction versus Wind Speed and Median Rainfall Data



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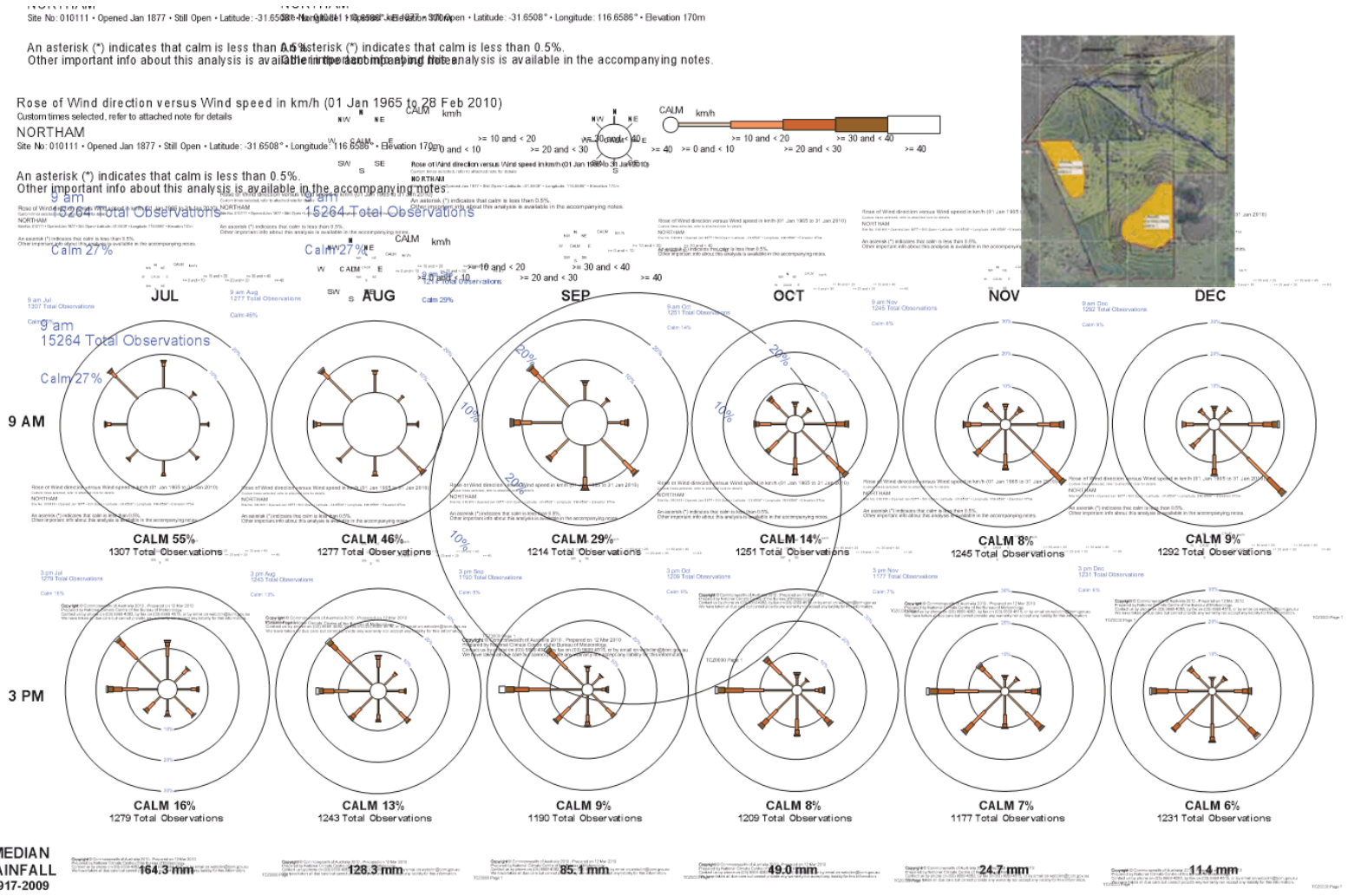

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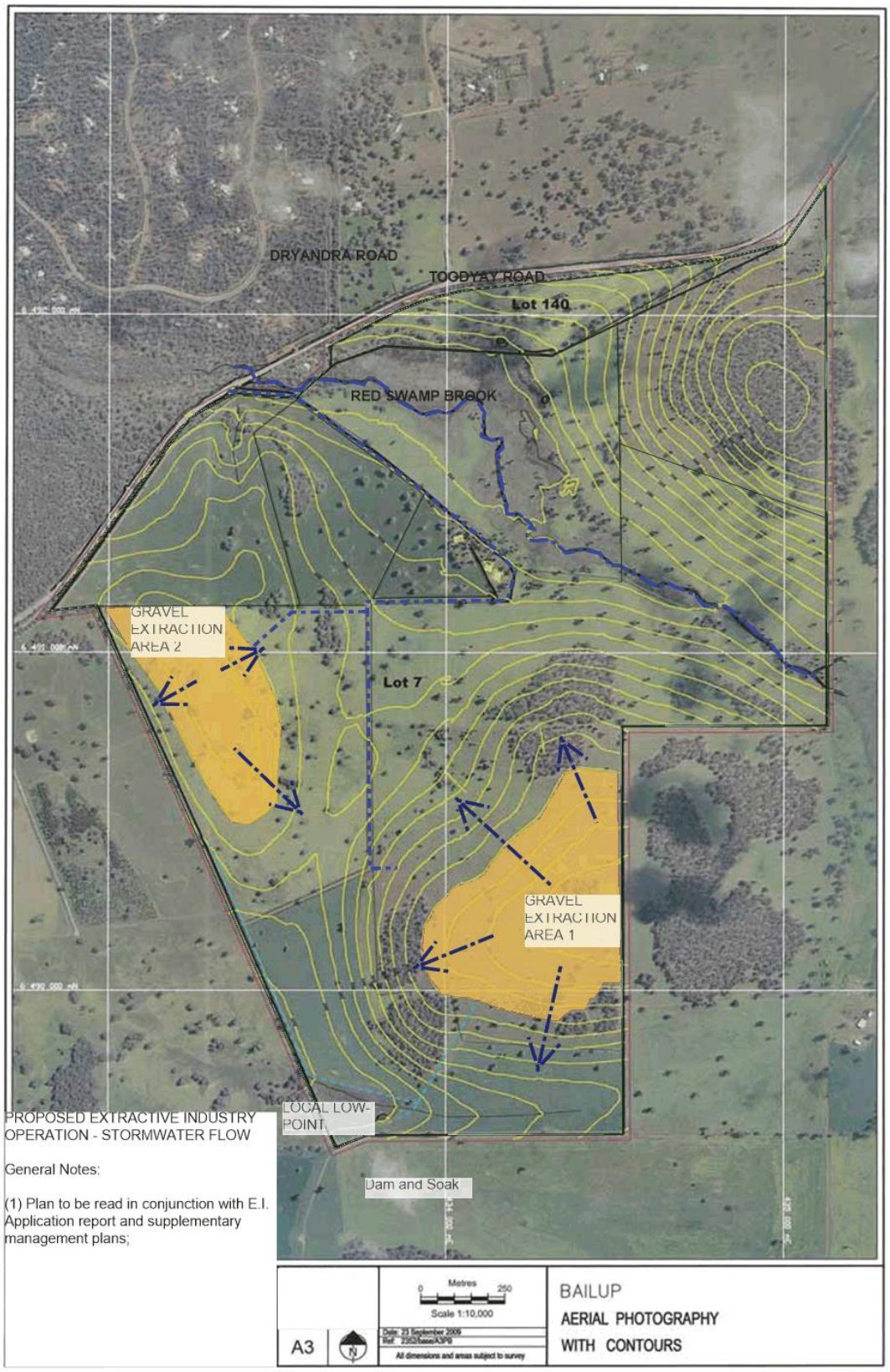
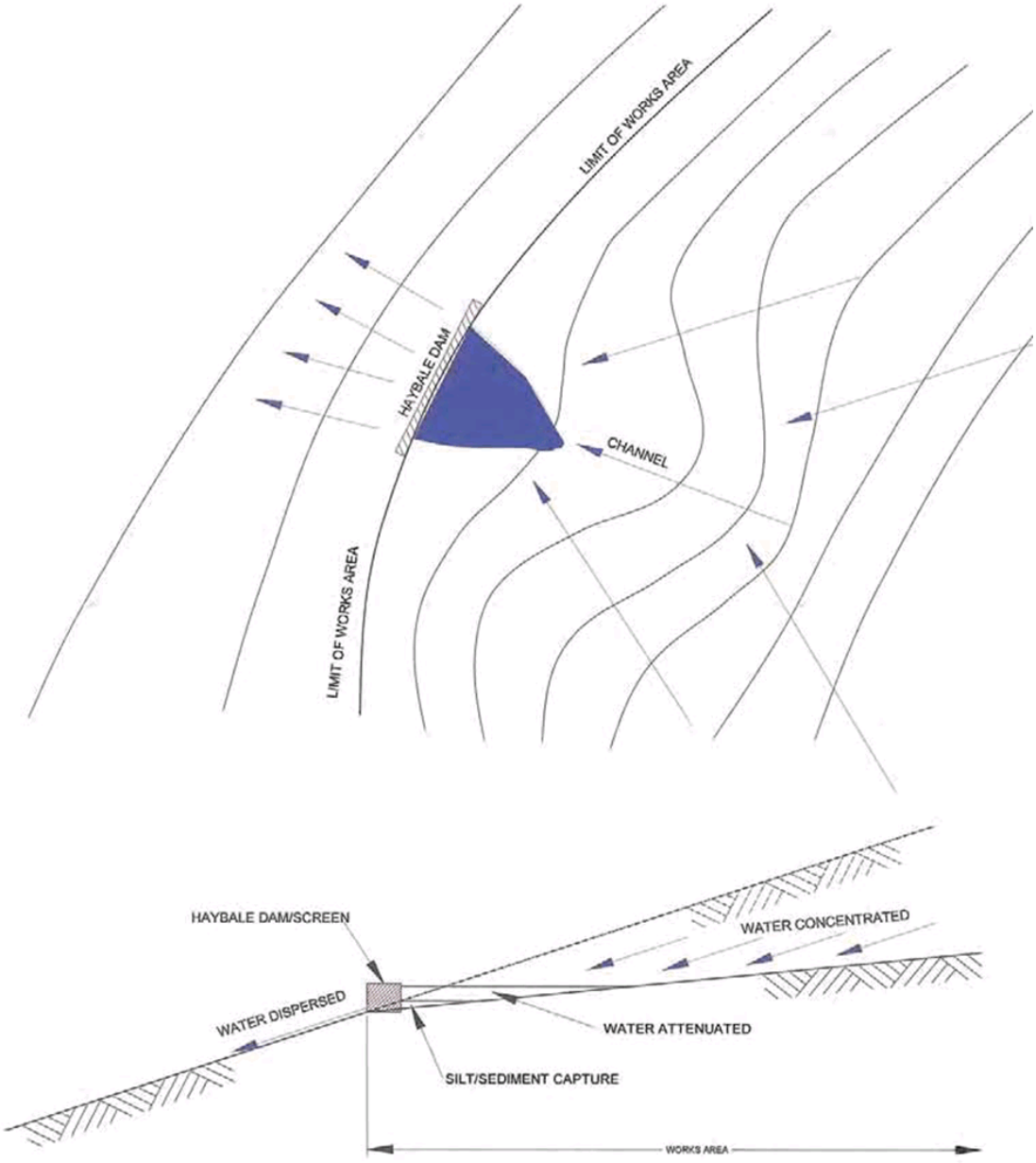
APPENDIX 2A

Stormwater Overland Flow Diagram


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
GRAVEL EXTRACTION AREA 2
Lot 7
GRAVEL EXTRACTION AREA 1
LOCAL LOW-POINT
Dam and Soak
PROPOSED EXTRACTIVE INDUSTRY OPERATION - STORMWATER FLOW
General Notes:
(1) Plan to be read in conjunction with E.I. Application report and supplementary management plans;
Metres
0
250
Scale 1:10,000
A3
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS

APPENDIX 2B

Hay Bale Sediment Trap

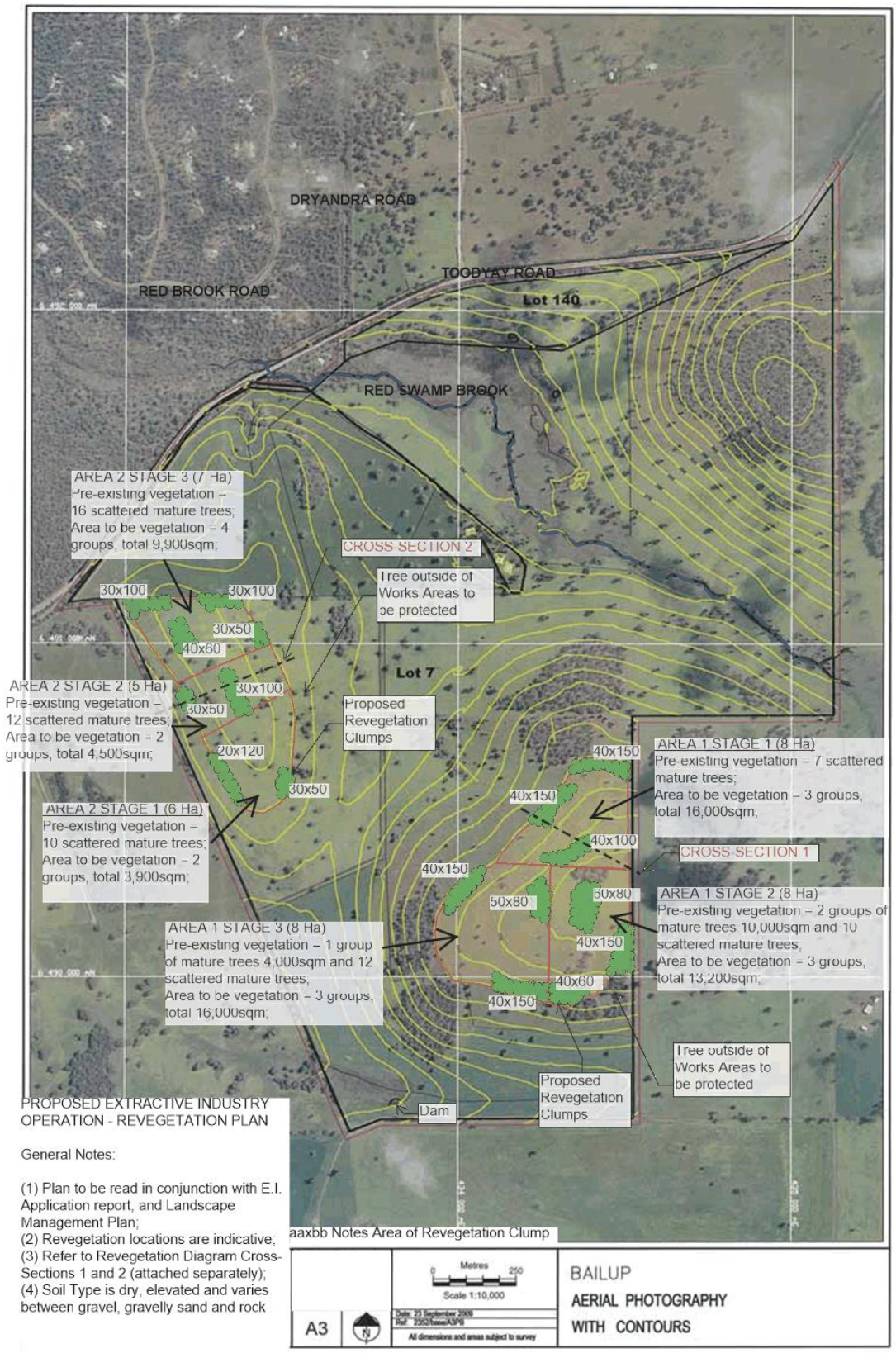


LOT 7 TOODYAY ROAD BAILUP
PROPOSED EXRTACTIVE INDUSTRY
STORMWATER MANAGEMENT PLAN

DIAGRAMMIC OF HAYBALE DAM
WATER ATTENUCATION AND
SEDIMENT TRAP

APPENDIX 3A

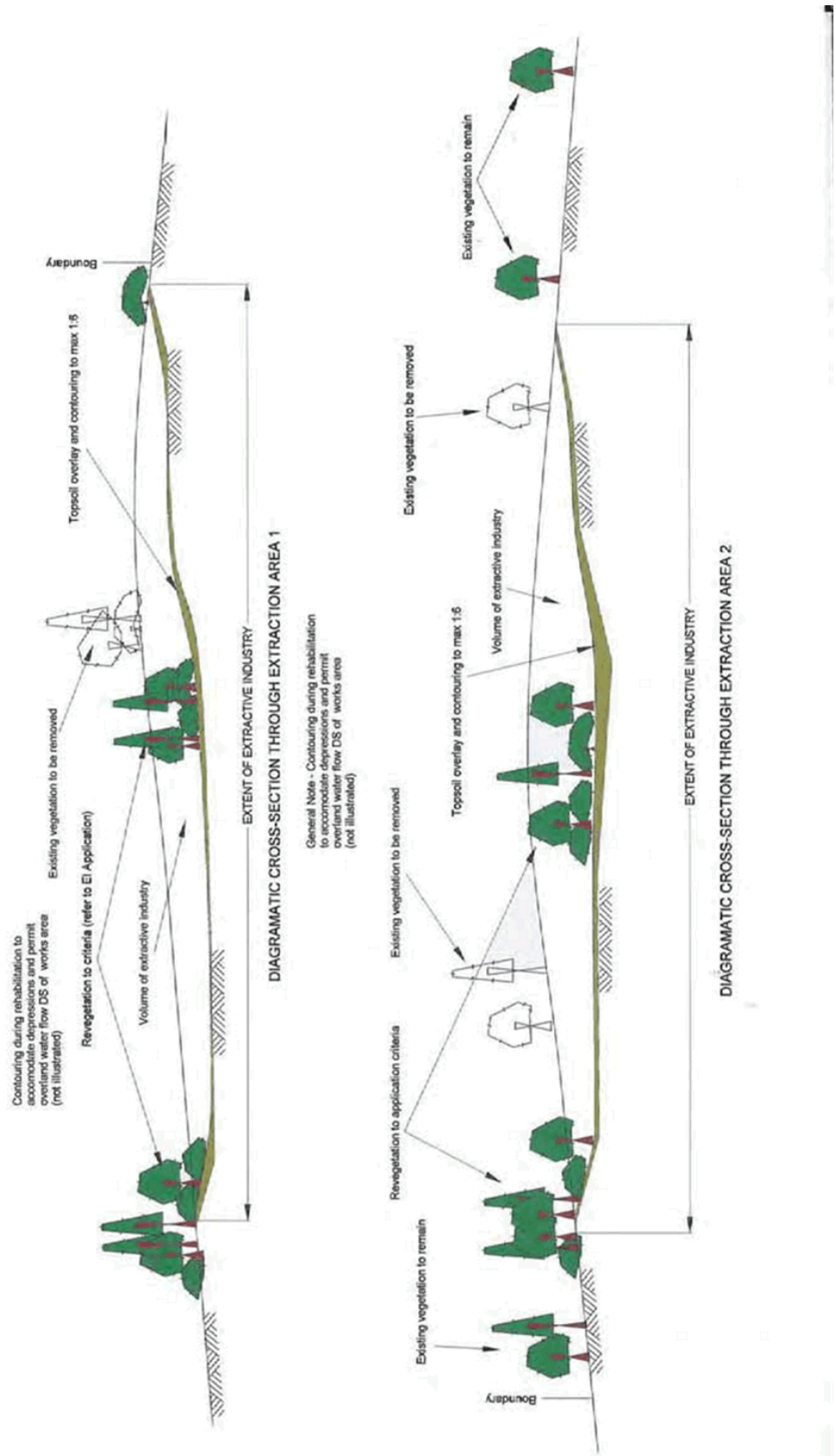
Revegetation Staging Plan


DRYANDRA ROAD
TOODYAY ROAD
RED BROOK ROAD
Lot 140
RED SWAMP BROOK
Lot 7
AREA 2 STAGE 3 (7 Ha)
Pre-existing vegetation – 16 scattered mature trees;
Area to be vegetation – 4 groups, total 9,900sqm;
CROSS-SECTION 2
Tree outside of Works Areas to be protected
30x100
30x100
30x50
40x60
AREA 2 STAGE 2 (5 Ha)
Pre-existing vegetation – 12 scattered mature trees;
Area to be vegetation – 2 groups, total 4,500sqm;
30x100
30x50
20x120
30x50
Proposed Revegetation Clumps
AREA 2 STAGE 1 (6 Ha)
Pre-existing vegetation – 10 scattered mature trees;
Area to be vegetation – 2 groups, total 3,900sqm;
AREA 1 STAGE 3 (8 Ha)
Pre-existing vegetation – 1 group of mature trees 4,000sqm and 12 scattered mature trees;
Area to be vegetation – 3 groups, total 16,000sqm;
AREA 1 STAGE 1 (8 Ha)
Pre-existing vegetation – 7 scattered mature trees;
Area to be vegetation – 3 groups, total 16,000sqm;
40x150
40x150
40x100
CROSS-SECTION 1
40x150
50x80
50x80
AREA 1 STAGE 2 (8 Ha)
Pre-existing vegetation – 2 groups of mature trees 10,000sqm and 10 scattered mature trees;
Area to be vegetation – 3 groups, total 13,200sqm;
40x150
40x60
40x150
Tree outside of Works Areas to be protected
Proposed Revegetation Clumps
Dam
PROPOSED EXTRACTIVE INDUSTRY OPERATION - REVEGETATION PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report, and Landscape Management Plan;
(2) Revegetation locations are indicative;
(3) Refer to Revegetation Diagram Cross-Sections 1 and 2 (attached separately);
(4) Soil Type is dry, elevated and varies between gravel, gravelly sand and rock
aaxbb Notes Area of Revegetation Clump
Metres
0
250
Scale 1:10,000
A3
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS

APPENDIX 3B

Diagrammatic Revegetation Cross-Sections

BAILUP PROPOSED EXTRACTIVE INDUSTRY - REVEGETATION DIAGRAM 1 & 2



APPENDIX 3C

Revegetation Planner and Species List

REVEGETATION PLANNER Rehabilitation and Revegetation Management Plan for Extractive Industry Lot 7 Toodyay Road, Bailup

A. Staging, Reforestation and Rehabilitation Activity summary

Stage	Area	Post Extraction Works	Description	Timing
1A, 1B, 1C Constructed sequentially	8Ha each	Re-contouring and earthworks	Grade base of excavation to blend into existing surface to max 1:4 and avoid area water collection/concentration	Upon completion of extractive industry
		Respread topsoil	Respread salvaged topsoil evenly over extraction area	Immediately after re-contouring
		Preparation for Revegetation	Identify group planting locations; Ripping where hard surfaces encountered	Mar-Apr
		Revegetation	Planting of seedlings	May-July
		Area and Qty of Revegetation	Stage 1A Area 16,000sqm Qty approx 1 per 10sqm = 1,600 plants	
			Stage 1B Area 13,200sqm Qty approx 1 per 10sqm = 1,320 plants	
			Stage 1C Area 16,000sqm Qty approx 1 per 10sqm = 1,600 plants	
		Revegetation Species	Random Mix selected from *Species Mix* with ¼ Tall Trees, Small Trees, Shrubs and Low Shrubs. Density as prescribed in *Density Criteria*	
		Protection	Maintain stock fencing;	
		Post care stage #1	Spraying for weeds	Sep-Oct
		Post care stage #2	Replacement of seedlings greater then 20% fall over	May-July following year
			Spraying for weeds	Sep-Oct following year
2A, 2B, 2C Constructed sequentially	6Ha each	Re-contouring and earthworks	Grade base of excavation to blend into existing surface to max 1:4 and avoid area water collection/concentration	Upon completion of extractive industry
		Respread topsoil	Respread salvaged topsoil evenly over extraction area	Immediately after re-contouring
		Preparation for Revegetation	Identify group planting locations; Ripping where hard surfaces encountered	Mar-Apr
		Revegetation	Planting of seedlings with fertiliser tablet	May-July
		Area and Qty of Revegetation	Stage 2A Area 3,900sqm Qty approx 1 per 10sqm = 390 plants	
			Stage 2B Area 4,500sqm Qty approx 1 per 10sqm = 450 plants	
			Stage 2C Area 9,900sqm Qty approx 1 per 10sqm = 990 plants	
		Revegetation Species	Random Mix selected from *Species Mix* with ¼ Tall Trees, Small Trees, Shrubs and Low Shrubs. Density as prescribed in *Density Criteria*	
		Protection	Maintain stock fencing;	
		Post care stage #1	Spraying for weeds	Sep-Oct
		Post care stage #2	Replacement of seedlings greater then 20% fall over	May-July following year
			Spraying for weeds	Sep-Oct following year

B. Species List

The following species shall be used for revegetation (adopted from *Shire of Mundaring Guidelines for Revegetation and Landscaping* approved species list)

Botanical Name	Common Name	Soils				Height (m)	Flower	Flowering time	Comments
		Dry	Avg	Dmp	Wet				
Tall Trees									
Eucalyptus calophylla	Marri	✓	✓	✓	×	30-40	cream	Late Feb – early Mar	valuable habitat for many native fauna
Eucalyptus wandoo	White Gum	✓	✓	✓	×	15-30	cream	Dec – May	heavy clay soils & granite; shade & shelter
Small to Medium Trees									
Acacia acuminata	Raspberry Jam	✓	✓	✓	×	5 +	yellow	Jul -Oct	loamy, sandy & gravelly soils
Acacia saligna	Orange Wattle	✓	✓	✓	×	5	yellow	Jul - Nov	dense, often weeping; variety of soils
Allocasuarina fraseriana	Jarrah Forrest Sheoak	✓	✓	×	×	10-15	red/rust	May - Oct	sandy/gravelly soils; windbreaks
Shrubs									
Acacia celastrifolia	Glowing Wattle	✓	✓	×	×	2	yellow	Apr - Aug	tough; attractive; good screen
Calothamnus rupestris	Mouse Ears	✓	✓	×	×	2-4	red	Jul - Dec	granite; horses won't eat
Hakea undulata	Wavy-leaved Hakea	✓	✓	×	×	2	cream	Jul - Oc	drought and frost resistant
Melaleuca incana	Grey Honey Myrtle	✓	✓	×	×	2	yellow	Jul - Nov	weeping understorey

Melaleuca radula	Graceful Honeymyrtle	✓	✓	✓	×	1-2	mauve	Jul - Nov	very versatile
Low Shrubs									
Acacia pulchella	Golden Stardust	✓	✓	✓	×	1	yellow	May - Dec	good understorey for dieback
Anigozanthos manglesii	Kangaroo Paw	✓	✓	×	×	0.5	red/green	Aug - Nov	perennial
Calothamnus hirsutus	Hairy Calothamnus	✓	✓	×	×	1	red	Sep - Feb	understorey; likes sun
Hypocalymma angustifolium	White Myrtle	✓	✓	✓	✓	1.5	white/pink	Jun - Oct	ornamental: versatile soil types
Melaleuca scabra	Rough Honeymyrtle	✓	✓	×	×	0.75	brightpink	Jan/Apr/Aug /Dec	road verges, understorey

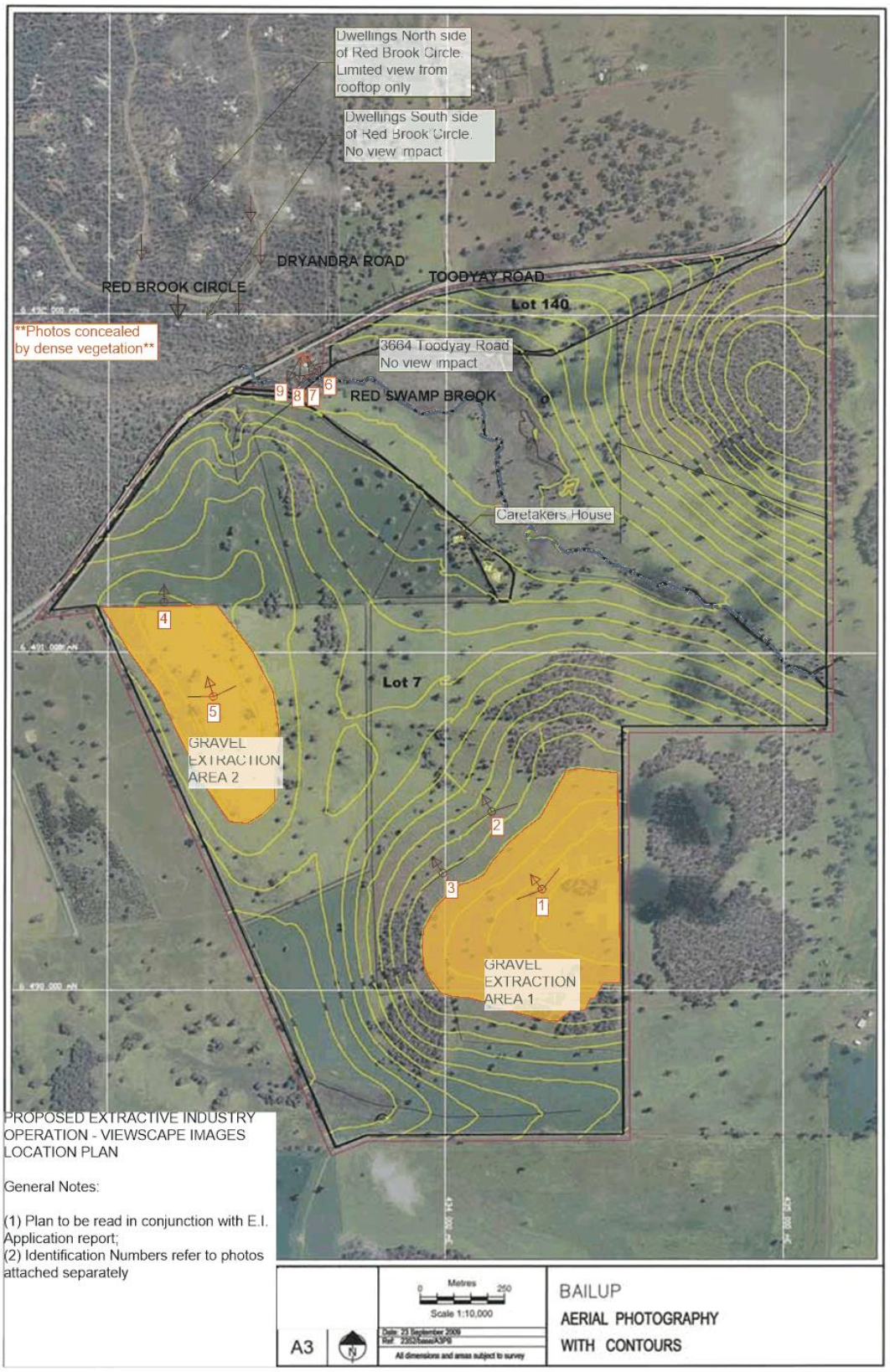
C. Density Criteria

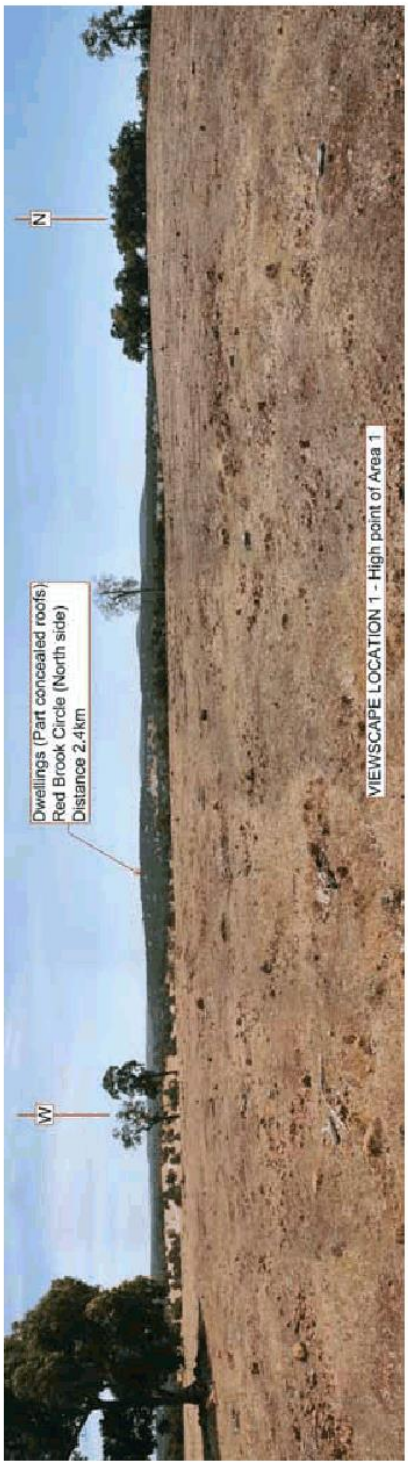
Revegetation shall be planted in accordance with the following criteria (adopted from *Shire of Mundaring Guidelines for Revegetation and Landscaping*):

Lifeform		Density
Category	**Height**	
Tall Trees	>15 metres	1 per 15m^2
Small to Medium Trees	5 -15 metres	1 per 10m^2
Shrubs	1 – 5 metres	1 per 8 m^2
Low Shrubs	<1.5 metres	1 per 5 m^2
Groundcovers and Scramblers	<0.5 metres	1 per 2 m^2
Grasses and Rushes	1 – 2 metres	1 per 1m^2

APPENDIX 4A

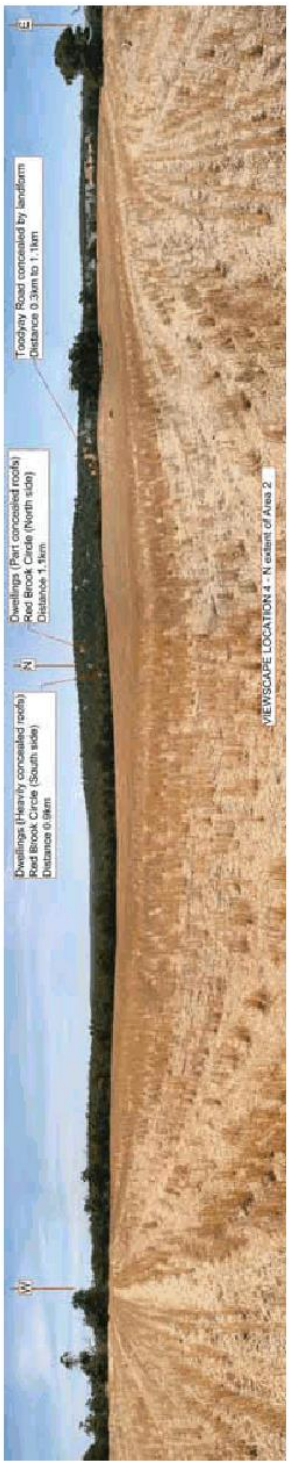
Viewscape Plan and Photographs Demonstrating Visual Impact


Dwellings North side of Red Brook Circle. Limited view from rooftop only
Dwellings South side of Red Brook Circle. No view impact
DRYANDRA ROAD
TOODYAY ROAD
RED BROOK CIRCLE
Lot 140
Photos concealed by dense vegetation
3664 Toodyay Road No view impact
RED SWAMP BROOK
Caretakers House
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PROPOSED EXTRACTIVE INDUSTRY OPERATION - VIEWSCAPE IMAGES LOCATION PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Identification Numbers refer to photos attached separately
A3
Metres
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 2.4km
VIEWSCAPE LOCATION 1 - High point of Area 1
N
W


Dwellings (Part concealed roofs)
Red Brook Circle (North and South side)
Distance 1.8km
Dwelling (Proponent's
Caretakers Cottage)
VIEWSCAPE LOCATION 2 - NNW extent of Area 1
N
W


Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 2.2km
N
W
VIEWSCAPE LOCATION 3 - W extent of Area 1


Toodyay Road concealed by landform
Distance 0.3km to 1.1km
Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 1.5km
Dwellings (Heavily concealed roofs)
Red Brook Circle (South side)
Distance 0.6km
N
W
VIEWSCAPE LOCATION 4 - N extent of Area 2


Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 1.1km
N
W
VIEWSCAPE LOCATION 5 - High Point of Area 2

Viewscape Photo 8

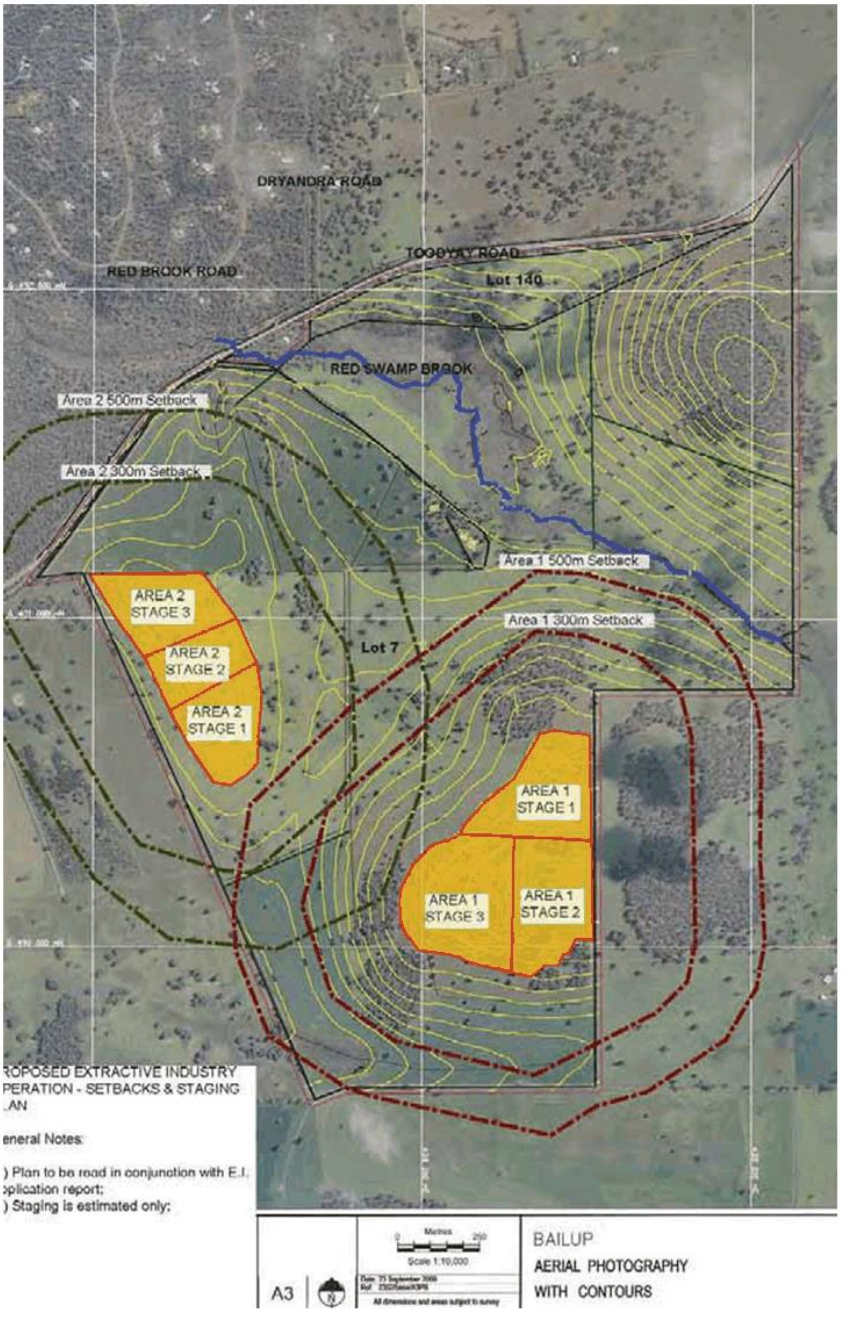
Viewscape Photo 9

Viewscape Photo 6

Viewscape Photo 7

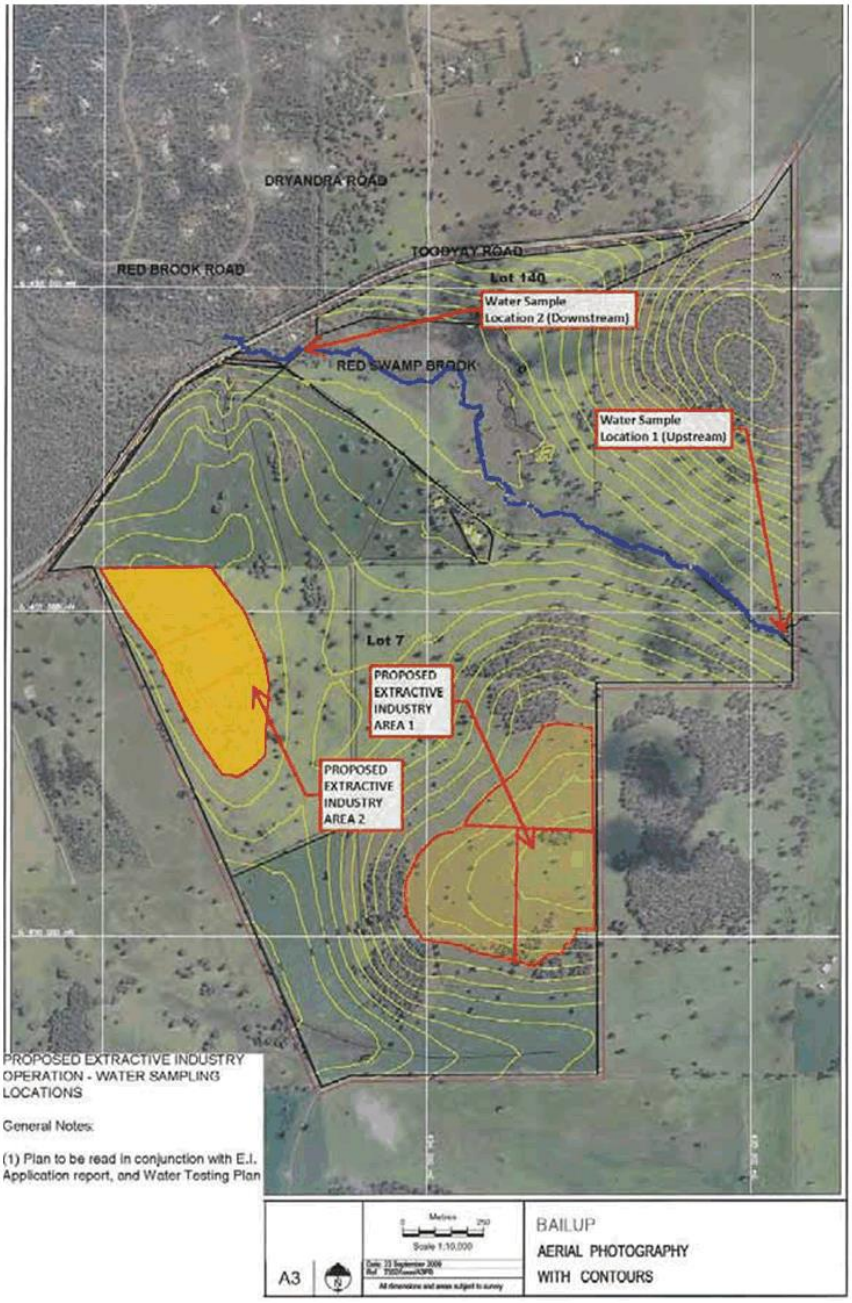
APPENDIX 4B

Site Plan and Buffer Distances



APPENDIX 5A

Site Plan, locating Water Sample Locations



Appendix 5B

Schedule of Water Quality Testing Action

Water Quality Test Action	**Description/Detail**
Water sample location	Water taken from flowing Red Swamp Brook at point entering The Site (south) and at point leaving The Site north)
Frequency	July every year
Qualitative Criteria	▪ Acidity (pH) ▪ Electrical Conductivity (EC) ▪ Nutrients (Ammonia and Nitrate levels, Total Phosphorous, Total nitrogen) ▪ Suite of Metals (Aluminium, Iron, Copper, Cadmium, Chromium, Nickel and Lead)
Comparative Analysis	▪ Comparison between water sample entering and leaving site. ▪ Comparison with control sample. ▪ Comparison with historical records
Triggering Event	A change of 25% in qualitative criteria , or, Comparative Analysis exceeding DEC contamination guidelines,
Reporting	Copy of Tests results and comparative analysis to – Shire of Mundaring Environmental Officer

Extractive Industry Application

Annexure 1

for

GREENWAVE NOMINEES

at

Lot 7 Toodyay Road, Bailup

3 March 2010

Prepared by:
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ANNEXURE 1 Executive Summary

This Annexure 1 is submitted to Shire of Mundaring as a supplementary document to the proponents' application to develop Extractive Industry ('EI') on Lot 7 Toodyay Road, Bailup ('The Site') dated 20-Oct-09.

After response from advertising and local government department assessment of the Extractive Industry application, the outcomes of a meeting held 22-Feb-10 warranted this Annexure 1 to allow for further assessment before endorsing to Mundaring Council.

At that meeting, those issues which the proponents needed to clarify, address further or provide additional investigation and documentation for were documented. That list of issues was circulated 2-Mar-10.

The contents of this Annexure 1 for the Extractive Industry Application for Lot 7 Toodyay Road, Bailup methodically addresses each of those specific issues.

Table of Contents

1. **Department of Indigenous Affairs**
   Comment from Advertising

   Comment:
   "A search of the Register of Aboriginal Sites...reveals that there is one site under the *Aboriginal Heritage Act* ...within the Proposal area: Dia 3536 (Swan River)"

DIA have been contacted and an enquiry search was made to better understand this site identification and its implication. To this regard, the following advice was made by DIA:

- Red Swamp Brook is considered by DIA as a Swan River tributary and therefore falls under the Registrar Site ID 3536 "Swan River", "mythological" type.

- The Aboriginal Heritage Inquiry System [found in Appendix A] refines the exact nature of the Registrar entry. Located on and over Red Swamp Brook is an approximately 20m wide strip of land which follows the watercourse through The Site from the mid-east boundary to the mid-north boundary.

- Any development over this identified area must seek consultation, approval and conditions from DIA.

In addressing the environmental impact and constraints of The Site, the EIL Application 20-Oct-09 identified Red Swamp Brook as an area of significance, requiring special control and protection. It also specifically advises that no works are proposed on or over Red Swamp Brook. This includes areas identified for extractive industry, vehicular access, and access to water for dust control purposes.

Therefore, the DIA advertising response is satisfied subject to activities adhering to the exclusion zone of Red Swamp Brook as stated in the EI Application.

Comment:
"It is recommended ... to conduct ethnographic and archaeological survey of the area."

DIA have been contacted to better understand this recommendation. To this regard, the following advice was made by DIA:

- DIA rely on landowners and developers volunteering of information which may be considered culturally significant by DIA.

- The recommendation of DIA is not a requirement unless the developers or other stakeholders are actually aware of any 'site' that may be affected by the proposal.

As detailed in the EI Application 20-Oct-09, the works area and surrounding land has historically been cleared for farming and agricultural pursuits – thereby mitigating the likelihood of locating an ethnographic or archaeological artefact.

Therefore, with point 1 above satisfied and the unlikelihood of a successful site-specific search, no ethnographic or archaeological survey shall be undertaken.

However, prior to commencement of any ground disturbing activities, subcontractors, employee and other personnel who will be attending The Site shall be advised of the DIA issues addressed here and concerns regarding disturbing 'sites' which may be identified or uncovered during activity on site.

2. Main Roads Department of WA
Comment from Advertising

MRWA advertising response has accepted the proposed development with conditions. Those conditions refer to the access onto Toodyay Road and include upgrading the crossover and widening Toodyay Road to accommodate turning truck traffic.

The proponent shall liaise with MRWA to confirm any works necessary and meet the MRWA conditions prior to commencing heavy haulage use on/off Toodyay Road. Engineering road construction designs shall be undertaken by the proponent for MRWA approval. Construction shall be supervised by MRWA.

Sight distance shall be demonstrated with photographic evidence to determine if trees need to be removed or pruned (adopting AS 1742 140m sight distance at 1.05m height 3m offset from road). Further, the design and construction of the intersection will reflect the proposed traffic needs.

3. Department of Water
Comment from Advertising

Comment:
"...there may be a requirement to obtain a license of the use of surface water."

Seeking further information, DOW Avon Valley Region was contacted to ascertain if water may be taken from the proposed dam. The following advice was made by DOW:

- 4 dams are identified on the property, including proposed use dam in south-west corner.
- The dam in the south-west corner is not of impact to Red Swamp Brook.

- The dam in the south-west corner is not part of a watercourse or fed from a creek, rather, is fed from shallow, superficial groundwater only.

- Because of the nature of the dam, its location and shallow groundwater filling no licence is required to be issued from DOW.

Therefore, DOW advertising response is satisfied and water may be taken from the dam without obtaining a license.

4. Department of Environment and Conservation
Comment from Advertising

DEC advertising response has accepted the proposed development with conditions. Those conditions refer to dust and noise management adhering to EPA and DEC guidelines. It also requests that revegetation, if not pastoral, should use flora species endemic to The Site.

Revegetation shall be undertaken in stages as areas of completed extraction are rehabilitated (piece-meal fashion). The selection of vegetation species shall be from those endemic to the area. The Shire of Mundaring Environmental Officer shall be advised of proposed species to seek acceptance prior to planting.

With regard to noise in amenity impact, the *EPA Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses* recommends a buffer distance of 'case by case' for the proposed form of Extractive Industry. However, *Sand and Limestone* extraction which closely reflects the proposed works has a recommended buffer distances between 300m - 500m. The most intensive form of rock extraction requiring regular blasting has been termed *hard rock Darling Scarp* and is given a recommended setback of 1000m.

"Sensitive" land use includes dwellings. Buffer distances in the *EPA Guidance Statement No. 3* refer to Gas, Noise, Odour, Dust and Risk.

A prescribed setback of 500m would be reasonable with consideration of the topography and vegetation concealing all dwellings and sensitive land uses for many kilometres (refer further information found in to Sections 5.5 and 5.6).

A Site plan which identified the 300m and 500m buffer distances is found at Appendix B. There are no sensitive land uses within the buffer distance, nor up to 1500m from Extraction Area 1 and 800m from Extraction Area 2. Therefore, the environmental impacts of the proposed Extractive Industry are considered to adequately far away from existing sensitive land uses.

DEC also confirms that:

"The subject site contains no records of threatened flora, fauna or communities and no threatened species of communities were found within a close proximity to the development that may be considered at risk from industrial disturbance."

5. Shire of Mundaring – Planning and Environmental Departments
5.1 Dieback Management

The Shire of Mundaring Environmental Officer has inspected The Site and requested supporting information as to the presence of *Phytophthora cinnamomi* ('dieback'), and provision of a Dieback Management Plan. It was acknowledged by Shire of Mundaring that the existing clumps of remnants of vegetation adjacent the proposed extraction areas are healthy with varying canopies and appear to be dieback free.

The surrounding region containing dense vegetation, farmland and varying topography, is not branded as a "dieback infested" area.

No soil is proposed to be imported to The Site for the purposes of the Extractive Industry.

Therefore, The Site is of *low* dieback risk. However, acting on the comments from the Shire of Mundaring Environmental Officers soil testing for presence of dieback was investigated.

Agwest Plant Laboratories were consulted regarding dieback testing of soil on The Site at the proposed gravel extraction areas. Their advice was as follows:

- Dieback testing is considered ineffective when sampling in-situ soils which have been dry for a reasonable period of time, such as during and after the summer season;
- Dieback testing in similar cases is only carried out after significant rains have impacted the soil for a reasonable time to activate any present dieback;
- Dieback is either in senescence or inactive when soils have little or no moisture, thus making them very difficult to culture in a laboratory to identify their presence as an active, live fungus;
- For the above reasons Agwest, as a policy. do not offer dieback soil testing from sites of a similar nature for at least the period of summer and part autumn as a policy;

It is prudent to mention that testing the site for dieback is not an assurance of its presence. Testing involves taking a few soil samples and considering them to be a representative of the whole.

Further, the requirement to undergo specific soils tests for dieback, including withholding any and all applications for Extractive Industry for the annual periods from November through May

(or as rainfall and soil moisture dictates) is not a requirement under the *Shire of Mundaring Extractive Industry Local Law* and is unreasonable to impose when the site has been determined to be of low risk without undertaking soils tests.

With The Site reasonably determined to be dieback free and external soils not to be imported onto The Site, the proposed development is not subject to any *Phytophthora cinnamomi* risk of introduction or spreading of contamination. Therefore, it is not deemed necessary to provide or implement a Dieback Management Plan.

5. Shire of Mundaring – Planning and Environmental Departments
5.2 Water Management

The Shire of Mundaring Environmental Officer has inspected The Site and requested further investigation regarding the taking of water for the purpose of dust control. Specifically, "taking of water from south-west dam may impact the localised wet area."

Water for dust suppression is proposed to be taken from a dam located in the south-west corner of The Site as detailed in the EIL Application 20-Oct-09. This is recognised as the safest and least impacting source.

The existing dam is located on the eastern side of an isolated low-lying area where approximately 2.5 hectares is either waterlogged or has water ponding on the surface (often termed a 'soak'). There are several trees located on the boundary of The Site in this area and further west is a small group of native trees. The surrounding land is used for cropping and grazing. There are no near-by areas of significant vegetation or bushland susceptible to significant fluctuations in surface water. This wet area is completely separate from Red Swamp Brook. It is not and does not form any type of creek or river system. Department of Water agree with this conclusion.

An estimate volume of water required to be taken from the dam for dust suppression is as follows:

Dry/summer	up to 9 loads per day (1 load per hour estimated)
Wet/winter	down to nil loads per day
Volume of watercart is	10 kilolitres
Estimated days of operation	100 days per year
Estimated average daily use	45 kilolitres
Estimate annual use	4,500 kilolitres

Department of Water has been consulted regarding taking of water and have confirmed that the proponent "does not require a licence [to regulate consumption] as water is being taken from an existing dam/soak which is not creek or bore fed."

The impact of taking water from this dam on the surrounding area can only be loosely estimated. However, some circumstantial information can be considered to ascertain if the water required to be taken would be considered a 'significant volume' or a 'significant impact'. That being:

- The shallow water table (or localised shallow spring) penetrates the surface in this area and ponds on the surface. Water appears to enter the dam from the underlying surface and localised ponding.

- An area of approximately 2.5 hectares is waterlogged and inaccessible by vehicle and it is unclear if water penetrates up or down at specific locations. Some water travels overland west but quickly re-enters the ground as there is no clear depression or identifiable creek-line.

- Surface water is localised and affected by a shallow, superficial water table. Water table volumes are estimated in the millions of kilo-litres and are affected by a multitude of variables. They are also affected seasonally such as the winter increase in the water table expands the size of the waterlogged surface.

- There is no water course, creek, wetland or other special environmental concern nearby. Water which penetrates the surface and ponds in this area is confined to the area. There is no evidence of a spring fed creek-line.

As the low area is likely to be a point with which the superficial water table protrudes the surface it is not feasible to measure the volume of water which may be encountered. Superficial water tables are simply not measured this way. Suffice to say, water tables can be affected by subsoil drains, earth working land forms and performing dewatering or other temporary water taking activities. The sorts of activities which are temporary in nature and not considered to be large volumes, such as 4,500 kL per annum, would do little to affect the localised ground water impact.

Ground water mapping and other exhaustive water monitoring would need to be undertaken for multiple seasons to obtain an estimate of maximum and minimum levels and would not demonstrate volumes to a degree of accuracy which would identify drawing 4,5000kL over the whole of the year. Being shallow/superficial, any data collected would not be suitable for relevance over subsequent years.

Shallow aquifer groundwater is, by nature, encountered in large volumes. Water extraction from the surface would bear little to no impact as the existing dam would simply recharge with the ground water from the immediate area. The rate of recovery would vary by the soil type, topography and head-pressure of underground water.

This Annexure confirms the EI Application 20-Oct-09 advised that:

- Water is required for the purpose of dust control over the works area and internal access roads as identified on the plans provided.

- Water shall be drawn with surface pumps into a tractor-drawn water tanker. The tank size is approximately 10,000 litres and each load takes approximately 1 hour to load, travel and unload.

- Water shall be taken from the existing dam located in the south-west corner of The Site.

- Water shall not be taken from Red Swamp Brook.

It is reiterated that the taking of water, access over and impact such as overland stormwater flow to Red Swamp Brook is not proposed in any part of the EI application. Therefore, no water management plans are applicable.

5. Shire of Mundaring – Planning and Environmental Departments
5.3 Acid Sulphate Soils

Acid Sulphate Soils (ASS) are considered of environmental significance in their affect on waterways when exposed to open-air through such activities as civil construction works. The Western Australian Planning Commission *Bulletin No. 64* documents the hazards of ASS and maps land areas considered to be of ASS potential.

WAPC mapping with layering of ASS data (Landgate's *WA Maps*) has no information regarding ASS on The Site.

A more detailed analysis by the Australian Soil Resource Information System (ASRIS) was investigated for ASS on The Site. The results were as follows:

- The low-lying area in the central-north part of The Site which covers part of Red Swamp Brook and the surrounding wetlands is considered to be type *A4 High Probability / Very Low Confidence*.

- The whole of the rest of The Site (affecting the areas of proposed EI) is determined to be type *C4 Extremely Low Probability / Very Low Confidence* (the lowest category for potential ASS).

The EIL Application 20-Oct-09 identifies Red Swamp Brook as an exclusion area and is not impacted by the proposed works. This exclusion also applies to the wetlands which surround Red Swamp Brook in the central north part of The Site.

As no excavation is proposed in this area, the probability of encountering ASS is "extremely low". Further, soil mapping which recognises the elevated and permanently dry rock/clay

nature of the proposed areas of excavation affirm that soils with acid sulphate potential are unlikely.

5. Shire of Mundaring – Planning and Environmental Departments
5.4 Carnaby's Black-Cockatoo

Investigation to the alleged sighting of an endangered species has been undertaken. According to the Australia Government Department of the Environment, Water, Heritage and the Arts,

> *"Carnaby's Black-Cockatoo is endemic to, and widespread in, the south-west of Western Australia. It occurs mostly in the wheatbelt, in areas that receive between 300 and 750 mm of rainfall annually, but is also found in wetter regions in the extreme south-west (including the Swan Coastal Plain, and the southern coast). Its range extends from Cape Arid to Kalbarri, and inland to Hatter Hill, Gibb Rock, Narembeen, Noongar, Wongan Hills, Nugadong, near Perenjori, Wilroy and Nabawa"*

Therefore, the Department of Environment and Conservation records have been consulted in the advertising response provided by DEC. They state:

> *"The subject site contains no records of threatened flora, fauna or communities and no threatened species of communities were found within a close proximity to the development that may be considered at risk from industrial disturbance."*

DEC have been contacted to confirm that their records include the Carnaby's Black-Cockatoo and to seek direction as to investigating the impact the proposed development may have on this endangered species of bird. Their advice was:

- The Carnaby's Black-Cockatoo is listed for protection on a state and federal level.
- Federal Government EPA typically accepts the State Government DEC comment/direction on endangered flora and fauna issues such as the Carnaby's Black-Cockatoo.
- Although widely spread in thin numbers, developments which require no clearing of native vegetation are not considered to be of impact. However, clearing of trees which can be identified as nesting would need to be further investigated and possibly subject to exclusion areas.
- A site specific Fauna or 'habitat' study which adheres to the *EPA Guide 51* is recommended. That survey would identify if those selective trees or small clumps of vegetation which are proposed to be removed do in fact have large nesting hollows or have evidence of feeding grounds suited to or visited by the Carnaby's Black-Cockatoo (including other similar species).

A botanist/zoologist has been consulted to investigate The Site with specific attention given to the areas of proposed gravel extraction and nearby remnant vegetation. His conclusion states,

> *"Two trees within the study area (both in Area 1) were observed to contain hollows that, from ground level, appeared to have entrances of a size possibly suitable for black cockatoos to use for nesting purposes. No evidence of any hollow actually being in use or previously used by black cockatoos was seen."*
>
> *"Evidence of past use as a roosting site (significant concentrations of feathers and droppings) was searched for during the day time field survey. No evidence of previous roosting on site was observed. It is the Authors opinion that the site is probably not ideal as a roosting location due to the fact that most of the trees present are isolated single trees and/or are relatively small in size."*
>
> *"Overall the potential impact of the proposal on black cockatoos can be considered to be extremely low given the area of potential habitat to be cleared is small and there are only two potentially inhabitable trees. This can easily be more than offset through implementation of the revegetation program. Similar and better quality habitats are common and widespread in the general area (e.g. areas of State Forest). Existing black cockatoo populations using the general area (either on a permanent basis or as seasonal visitors) will not be significantly affected by the loss of this small area of habitat."*

The report in full is found at Appendix E.

5. Shire of Mundaring – Planning and Environmental Departments
5.5 Acoustic Impact

The Shire of Mundaring Planning Officer has requested further investigation as to the acoustic ('noise') impact of the proposed development.

The EI Application 20-Oct-09 section 2.14 and its Appendix C *Dust and Noise Management Plan* addresses the potential for noise pollution and describes how The Site meets noise impact assessment guidelines through:

- Physical barriers (topography and vegetation);
- Physical distance (buffers);
- Time (operating during normal working hours);
- Pre-existing impact (existing Toodyay Road heavy traffic load);

Noise impact is referred in *EPA Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses* which recommends a buffer distance of 'case by case' for the proposed form of Extractive Industry. Buffer distances for *Sand and Limestone* type of extraction are recommended between 300m - 500m; while distances for the most intense rock

mining which required blasting for all extraction activity, termed *hard rock Darling Scarp*, is 1000m. The proposed activity is considered similar to limestone extraction as it uses similar type of plant and equipment.

"Sensitive" land use includes dwellings. Therefore the prescribed buffer distances have been applied to determine if noise impact is acceptable.

A recommended buffer of 500m reasonable considers the nature of the proposed works, and the topography and vegetation barriers which already exist.

A site plan which identified the 300m and 500m buffer distances is found at Appendix B. There are no sensitive land uses within the buffer distance up to 1500m from Extraction Area 1 and 800m from Extraction Area 2. Therefore, the environmental impacts of the proposed Extractive Industry are considered to be adequately far away from existing sensitive land uses. There is no reasonable requirement to undertake theoretical acoustic noise modelling.

5. Shire of Mundaring – Planning and Environmental Departments
5.6 Visual Impact

The Shire of Mundaring Planning Officer has request further investigation as to the visual amenity impact of the proposed development – specifically regarding the existing dwelling to the north of The Site.

Visual impact is not clearly defined in local, state or federal policies or guidelines, however it has been addressed in the EI Application 20-Oct-09 section 2.17. It advises that the same forms of assessment for acoustic influence on sensitive land uses can be applied to visual impact. They are directly proportional in this instance.

The following visual barriers have been demonstrated to either already exist or will be implemented by the proponent:

- Landform topography. Where low-lying dwellings have no line of site to the works area;
- Vegetation barriers along Toodyay Road which substantially conceals sight;
- Dense vegetation remnants on the north side of the propose extraction Area 1 which conceal much of the activity from sight from the north;
- Dense vegetation surrounding dwellings located to the north of The Site. Both the single house on the south side of Toodyay Road and all the dwellings in the semi-rural development on the north side of Toodyay Road have been constructed amongst small cleared building pads within dense vegetation;

- Physical distance. Where current and pre-existing agricultural activities that use trucks, earthmoving equipment, large engine machines for planting, fertilising and harvesting have been used over the whole of The Site. The proposed activity would utilise items of plant and equipment of a similar nature (size, power, noise, engine, etc) – although concentrated at the greater distance on a smaller area. Therefore, the visual and acoustic impacts would be an increase to a pre-existing circumstance;

- Staged extraction and revegation will mitigate impact by not exposing large areas to EI at a single time;

- Staged rehabilitation and revegetation will promote the early addition of vegetation screening which will aid in concealing subsequent stages from line-of-sight. Refer to Appendix B for staging plan;

Photographic evidence has been taken on site to demonstrate the above and that the existing dwellings are heavily concealed from visual impact of the proposed extractive industry. [Refer to Appendix C for photographic evidence].

Landscape photography has been taken from proposed Extraction Areas 1 and 2 and found that the only dwellings which can be seen from The Site are between 1.1km and 1.8km to the north - far further than the recommended setbacks for the proposed form of development.

Of those dwellings, only part of their rooftops can be seen [Refer to Appendix C]. In an attempt to take photographic evidence from the north, adjacent those dwellings, back over towards The Site vegetation and topography in almost all places completely conceal the proposed development.

Specific attention was given to 3664 Toodyay Road (the closest dwellings to The Site). Photos clearly demonstrate that the dwelling and its surrounds are completely shielded from view of the proposed activity [Refer to Appendix C].

There is no visual impact of any significance.

5. Shire of Mundaring – Planning and Environmental Departments
5.7 Rehabilitation

The Shire of Mundaring Planning Officer has request further information regarding the rehabilitation and remediation works with reference to the *Visual Landscape Planning in Western Australia* manual.

That manual briefly refers to the scope of works found within this application under *Part 3 Rural Uses.* It states:

> *"The term 'rural' is used in the guideline to refer to non-urban landscapes that have been substantially modified, generally by clearing."*

The Site has been historically cleared and perpetually used for agricultural use (cropping and grazing). Pockets of remnant vegetation are present. The proposed area for EI are primarily cleared with either a small pocket or isolated trees to be felled to complete an area.

It continues:

> *"The rural land uses addressed in this guideline were chosen on the basis that their landscape impacts are currently of concern to the community. For this reason, some important rural uses, such as grain crops or grazing, are not discussed. Discussion focuses broadly on generic principles that address protection of rural character, remnant vegetation and /or clearing, revegetation and rural roads. In more detail this guideline addresses rural residential issues and plantations."*

The proposed development is therefore not specifically covered in the guideline. This is because:

a) important rural uses have pre-developed the site, including mass clearing of vegetation;

b) the rural character is only temporarily affected and predominantly blocked from view of dwellings and nearby roads;

c) very little clearing is required while significant pockets of remnant vegetation and the majority of the site are left undisturbed;

d) internal roadways are already constructed and used for current rural pursuits;

e) the revegetation plan *increases* the quantum of native vegetation by planting endemic species where there were none pre-development;

The Planning document also states:

> *"Visual impact assessments should be undertaken for proposals with potential to affect rural landscapes such as:*
> - *rural residential subdivisions;*
> - *remnant vegetation clearing, revegetation, and farm forestry, including plantations;*
> - *major tourism developments*
> - *new roads or major changes to character of existing roads with scenic value, and*
> - *windfarms and other utilities"*

None of the above criteria are applicable while proposed clearing is of a very minor amount of trees.

As already explained in the EI Application 20-Oct-09 and within this Annexure 1, the post-development rehabilitation will markedly increase the quantum and area of native vegetation than exists pre-development.

Diagrammatic revegetation plans are found in Appendix D and illustrate how revegetation shall be undertaken on and near the proposed areas of extraction during rehabilitation stage by stage.

Guidelines for revegetation shall apply to recreate an environment better suited to native flora and to encourage re-introduction of native fauna. Those 'criteria' include:

a. Planting to occur mid-winter through mid spring to improve percentage of new plant establishment.

b. Planting to be native endemic species of a random and mixed variety.

c. Planting to be in clumps of mixed species to represent pre-clearing and adjacent uncleared vegetation areas.

d. Planting to be concentrated on the perimeter of works area to promote reintroduction of native fauna as well as the rehabilitation and stabilisation of batters formed by earthworks.

e. Planting to be secondarily concentrated in clumps within the rehabilitation areas to avoid excessively large open and bare areas, or sparse, formal type revegetation layouts.

f. Guidelines for planting tree farms adopt a 'valley to valley' approach rather than 'ridge to ridge'. Therefore, planting at the perimeter of the rehabilitation shall be in a 'valley-to-valley' method.

g. Staging of extraction and rehabilitation will permit revegetation of completed areas as soon as practical to promote early regrowth while subsequent states are under operation.

Diagrammatic cross-sections illustrate the above criteria are found at Appendix D.

5. Shire of Mundaring – Planning and Environmental Departments
5.8 General Information & Clarification

The proposed gravel extraction occupies the areas as detailed on the plans included with the EI Application 20-Oct-09. However, within each of those two areas, gravel extraction shall be staged.

Staging of the works is for the purpose of:

- Minimise the total area of disturbed soil at any one time;
- Minimise the need for dust control;
- Minimise the visual impact;
- Staging rehabilitation to allow for early revegetation of completed areas of extraction without waiting for all works to be completed;

Refer to Appendix B for staging plan.

Proposed operating hours for the EI are 7am to 5pm Monday through Saturday. No Sunday activity.

The need for blasting of rock is not fully determined even though Geotech testing has been undertaken. The density of resource can only be estimated and is likely to vary as gravel is encountered The proposed activity will use earthmoving equipment (such as ripping rock with bulldozers) to its capacity before undertaken blasting. If and when blasting is required, the application, approvals, notices and procedures shall consult and be undertaken in accordance with the local and state authority requirements for blasting.

A request for a Geotechnical report will not be satisfied in the EI Application as that information is not required under the *Local Law for Extractive Industry*, and does not impact any planning uses such as ground water controls, building foundations or roadworks designs – all of which are not part of the proposed Extractive Industry.

6. Other Information & Corrections to EIL Application 20-Oct-09

We affirm that the EI application submitted to Council dated 20-Oct-09 is for a "development approval *and* extractive industry licence" and that the requirements of the Shire of Mundaring extractive industry local law has been addressed. This is for the expressed purpose of seeking a licence for Extractive Industry on this Site.

The EI application dated 20-Oct-09 incorrectly refers to the proponents as Corio Sand Pty Ltd in the Executive Summary and Section 1.1. The proponents are Greenwave Nominees as correctly named on the application cover page and the Shire of Mundaring TPS No. 3 Form 1 document.

APPENDIX A

Aboriginal Heritage Inquiry System search results

Government of **Western Australia**
Department of **Indigenous Affairs**

Aboriginal Heritage Inquiry System

Register of Aboriginal Sites

Search Criteria

1 sites in street address '3650 Toodyay Rd Ballup'.

Disclaimer

Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.

Copyright

Legend

Restriction		Access	
N	No restriction	C	Closed
M	Male access only	O	Open
F	Female access	V	Vulnerable

Coordinate Accuracy

Accuracy is shown as a code in brackets following the site coordinates.

[Reliable]	The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
[Unreliable	The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

Status

L	Lodged	IR	Insufficient Information (as assessed by Site Assessment Group)
I	Insufficient Information	PR	Permanent register (as assessed by Site Assessment Group)
P	Permanent register	SR	Stored data (as assessed by Site Assessment Group)
S	Stored data		

Site Assessment Group (SAG)

Sites lodged with the Department are assessed under the direction of the Registrar of Aboriginal Sites. These are not to be considered the final assessment.

Final assessment will be determined by the Aboriginal Cultural Material Committee (ACMC).

Spatial Accuracy

Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:Z50' means Easting=5000000, Zone=50.

Government of Western Australia
Department of Indigenous Affairs

Aboriginal Heritage Inquiry System

Register of Aboriginal Sites

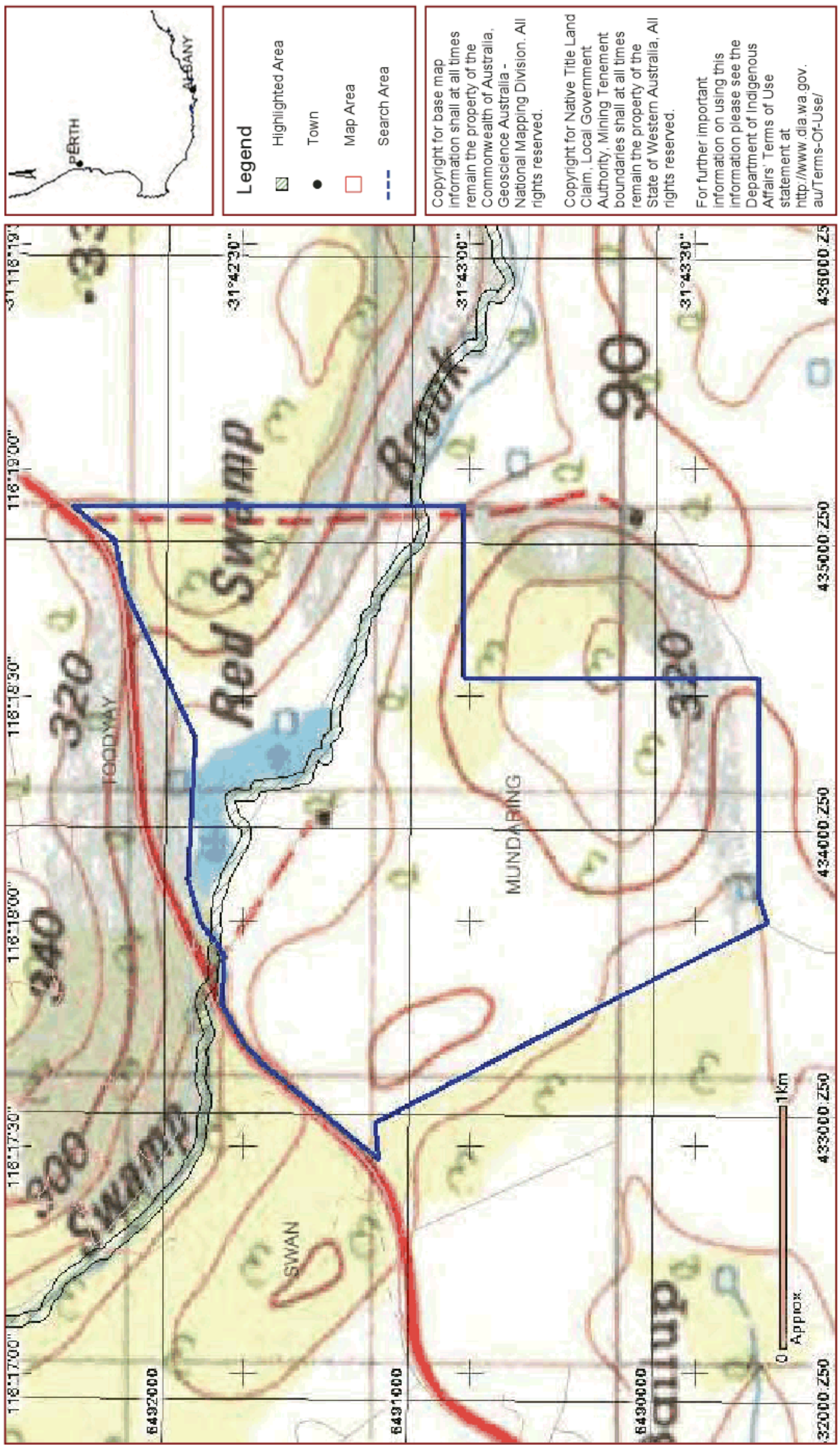
Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
3536	P	O	N	Swan River	Mythological		*Registered Informant names available from DIA.	443400mE 6461957mN Zone 50 [Reliable]	S02548

Report created 23 Feb 2010 13:50:14. Identifier: 653330.

Government of Western Australia
Department of Indigenous Affairs

Aboriginal Heritage Inquiry System

Register of Aboriginal Sites

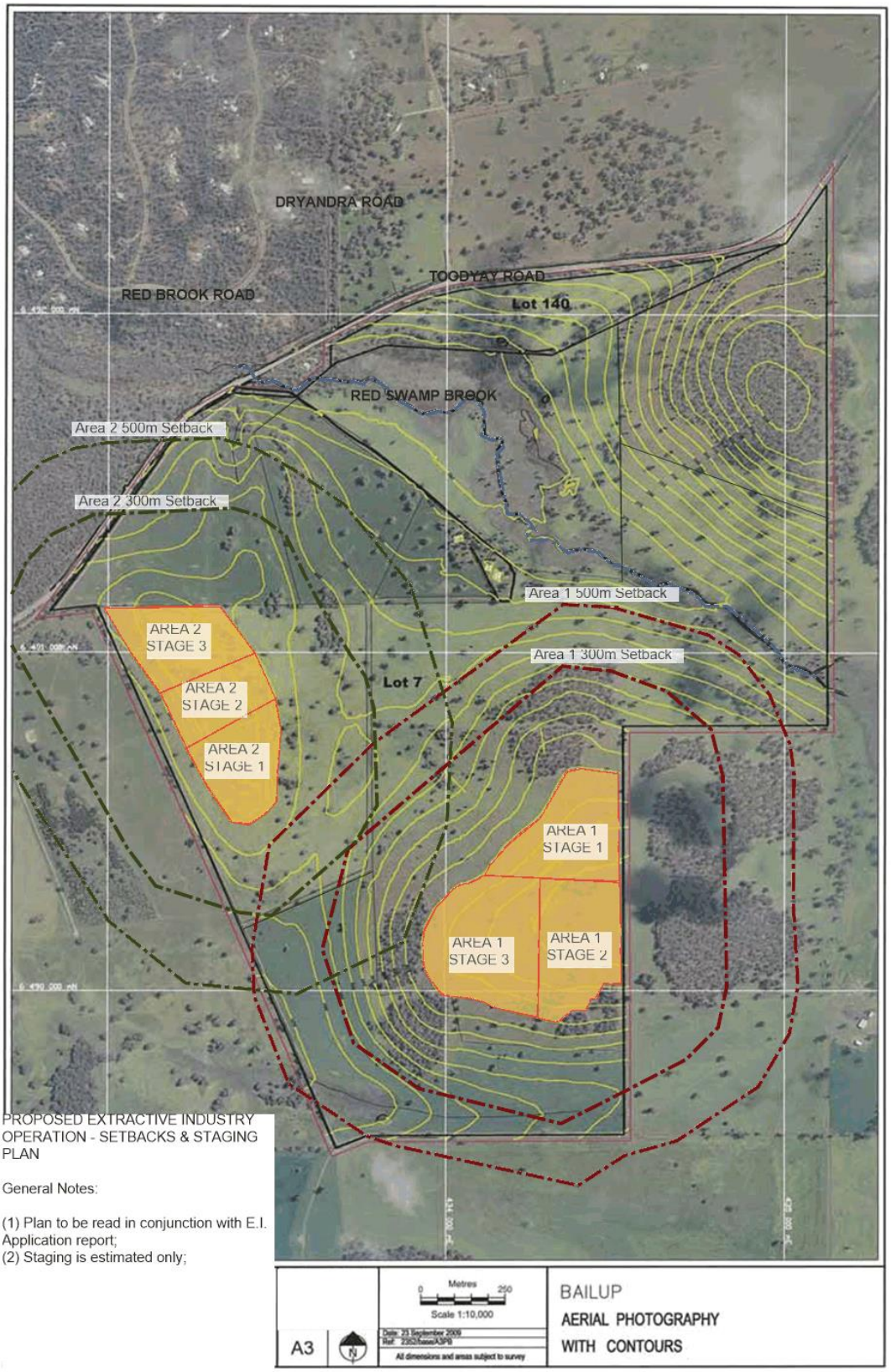


For further important information on using this information please see the Department of Indigenous Affairs' Terms of Use statement at http://www.dia.wa.gov.au/Terms-Of-Use/

Report created 23 Feb 2010 13:50:14. Identifier: 653330.

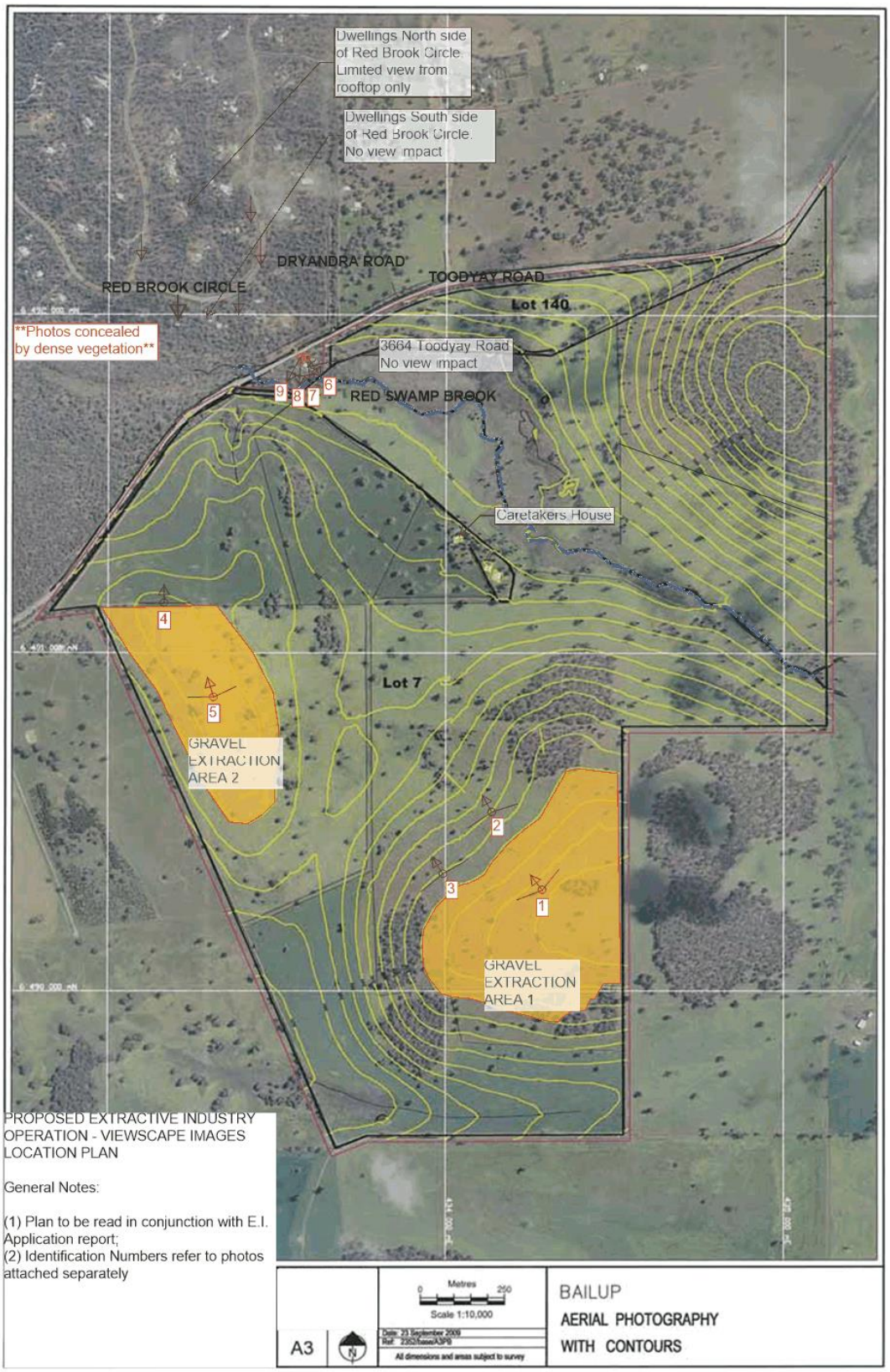
APPENDIX B

Site plan identifying buffer distances and staging plan


DRYANDRA ROAD
TOODYAY ROAD
RED BROOK ROAD
Lot 140
RED SWAMP BROOK
Area 2 500m Setback
Area 2 300m Setback
Area 1 500m Setback
Area 1 300m Setback
AREA 2 STAGE 3
AREA 2 STAGE 2
AREA 2 STAGE 1
Lot 7
AREA 1 STAGE 1
AREA 1 STAGE 3
AREA 1 STAGE 2
PROPOSED EXTRACTIVE INDUSTRY OPERATION - SETBACKS & STAGING PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Staging is estimated only;
Metres
0
250
Scale 1:10,000
A3
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS

APPENDIX C

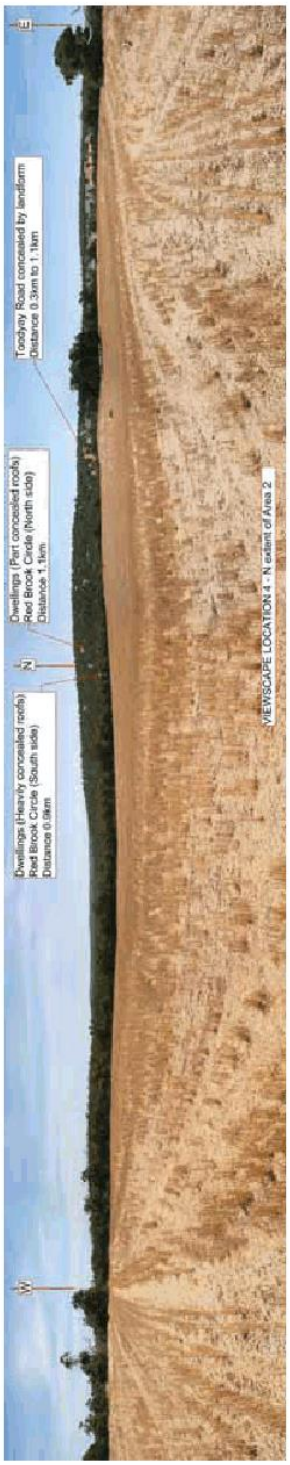
Viewscapes Plan and Photographs Demonstrating Visual Impact


Dwellings North side of Red Brook Circle. Limited view from rooftop only
Dwellings South side of Red Brook Circle. No view impact
DRYANDRA ROAD
TOODYAY ROAD
RED BROOK CIRCLE
Lot 140
Photos concealed by dense vegetation
3664 Toodyay Road No view impact
RED SWAMP BROOK
Caretakers House
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PROPOSED EXTRACTIVE INDUSTRY OPERATION - VIEWSCAPE IMAGES LOCATION PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Identification Numbers refer to photos attached separately
Metres
Scale 1:10,000
A3
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 2.4km
VIEWSCAPE LOCATION 1 - High point of Area 1
N
W


Dwellings (Part concealed roofs)
Red Brook Circle (North and South side)
Distance 1.8km
Dwelling (Proponent's
Caretakers Cottage)
VIEWSCAPE LOCATION 2 - NNW extent of Area 1
N
W


Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 2.2km
VIEWSCAPE LOCATION 3 - W extent of Area 1


Tondyay Road concealed by landform
Distance 0.3km to 1.1km
Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 1.5km
Dwellings (Heavily concealed roofs)
Red Brook Circle (South side)
Distance 0.6km
VIEWSCAPE LOCATION 4 - N extent of Area 2


Dwellings (Part concealed roofs)
Red Brook Circle (North side)
Distance 1.3km

Viewscape Photo 8

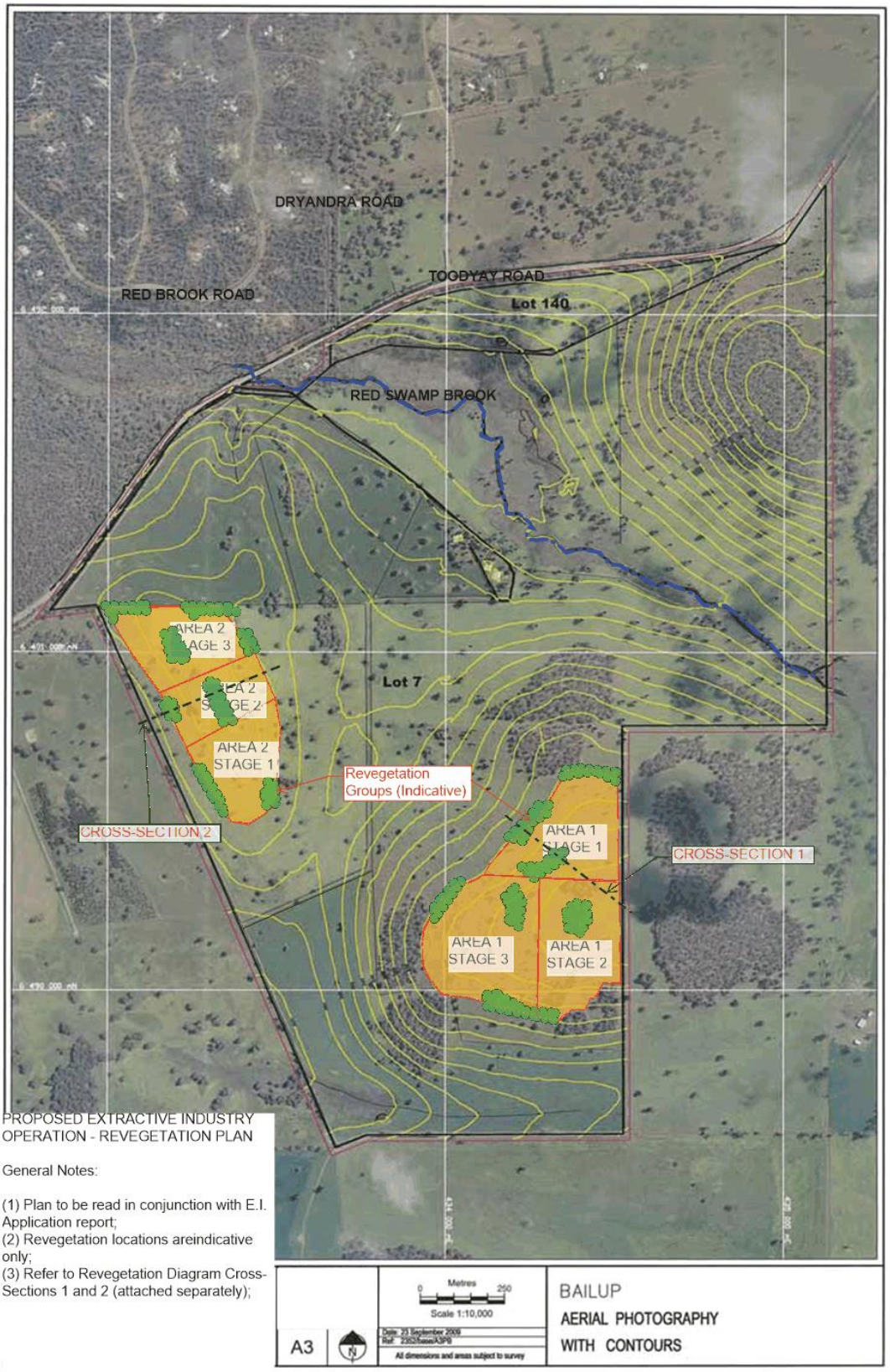
Viewscape Photo 9

Viewscape Photo 6

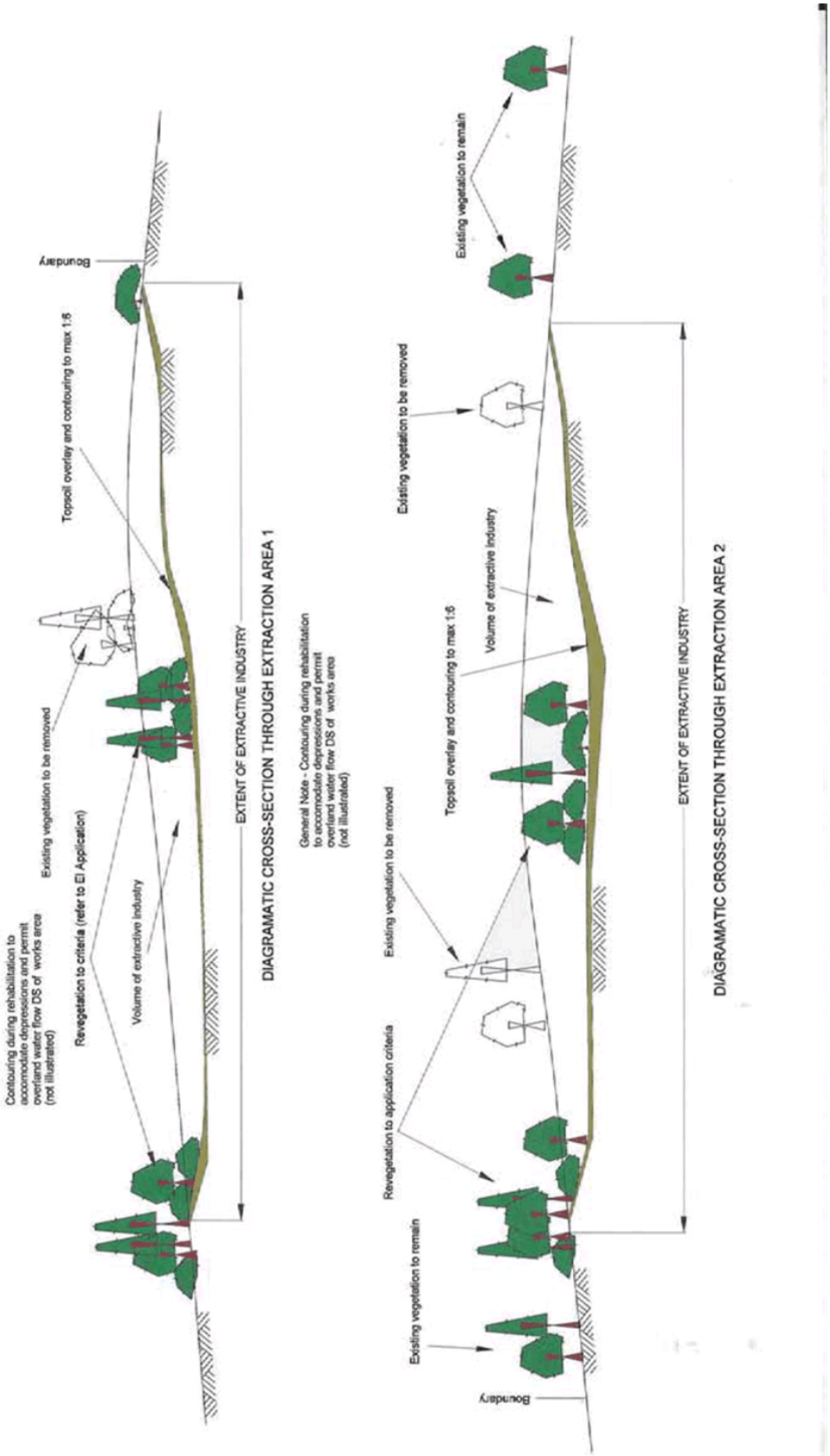
Viewscape Photo 7

APPENDIX D

Revegetation Plan and Cross-sections


DRYANDRA ROAD
TOODYAY ROAD
RED BROOK ROAD
Lot 140
RED SWAMP BROOK
Lot 7
AREA 2 STAGE 3
AREA 2 STAGE 2
AREA 2 STAGE 1
Revegetation Groups (Indicative)
CROSS-SECTION 2
AREA 1 STAGE 1
CROSS-SECTION 1
AREA 1 STAGE 3
AREA 1 STAGE 2
PROPOSED EXTRACTIVE INDUSTRY OPERATION - REVEGETATION PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Revegetation locations areindicative only;
(3) Refer to Revegetation Diagram Cross-Sections 1 and 2 (attached separately);
Metres
0
250
Scale 1:10,000
A3
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS

BAILUP PROPOSED EXTRACTIVE INDUSTRY - REVEGETATION DIAGRAM 1 & 2



APPENDIX E

Botanist report for Carnaby's Black-Cockatoo

BLACK COCKATOO

HABITAT ASSESSMENT

Proposed Gravel Extraction Area

Lot 7

Toodyay Road

Bailup

April 2010
Version 2

On behalf of:
Greenwave Nominees
945 Abernathy Road
OAKFORD WA 6121

Prepared by:
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FIGURES

1. INTRODUCTION

This following report details an assessment of potential black cockatoo habitat (foraging, roosting and nesting habitat) located within a proposed gravel extraction area at Lot 7 Toodyay Road, Bailup (the study area). The gravel extraction areas total about 47 ha and are, with the exception of widely scattered trees and some groves of trees largely cleared of native vegetation (Figure 1).

Note: For the purposes of this proposal 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*).

2. SCOPE OF WORKS

To comply with a request from the Mundaring Shire's Environmental Officer a black cockatoo habitat assessment was required to determine the sites importance to these species. The assessment will allow a management plan to be formulated (if required). To comply with these requirement the scope of works was defined as:

1. Habitat Tree Survey (including potential black cockatoo nest hollows) and black cockatoo foraging habitat assessment; and

2. Report summarising results with management recommendations.

3. METHODOLOGY

Potential Nest Hollow and Foraging Habitat Survey

All trees within the proposed clearing areas were assessed for the potential to contain suitable hollows for black cockatoos. Characteristics of each tree recorded will include tree species, number, type and size of hollows observed.

For the purposes of this study a potential nest hollow was defined as:

Generally any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) that had an entrance greater than about 12cm in diameter and would allow the entry of a cockatoo (white tailed or red-tailed) will be recorded as a "potential nest hollow".

It should be noted that the assessment of hollows from ground level using this method is likely to result in an over estimation of the number of hollows that would be suitable for use by black cockatoos as the full characteristic of the

hollow cannot be made. The method will however provide an idea of the relative abundance of hollows.

In addition any direct observations of black cockatoo individuals or evidence of foraging/roosting will be recorded to species level if possible.

Vegetation units will be examined during the field survey work and their value as cockatoo foraging habitat will be noted along with any actual evidence of foraging

Report

- Preparation of a draft report for review summarising all results with discussion of implications of any proposed development and potential management measures;

- Preparation of a final report.

Field survey work was carried out by Greg Harewood on the 7th April 2010.

4. BLACK COCKATOO - SPECIES PROFILES

All three Black Cockatoo species are listed as specially protected (Schedule 1 - Fauna that is rare or is likely to become extinct) under the Western Australian Wildlife Conservation Act (*WC Act 1950*). Under the federal Environment Protection and Biodiversity Conservation Act (*EPBC Act 1999*) the Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo are listed as Vulnerable, while Carnaby's are listed as Endangered.

Carnaby's Black- Cockatoo *Calyptorhynchus latirostris*

Status and Distribution: Carnaby's Black Cockatoo is listed as Scheduled 1 under the *WC Act (1950)* and as Endangered under the *EPBC Act (1999)*. The species was once common, but is now in dramatic decline (Shah 2006). In the last 45 years the species has suffered a 50% reduction in its range and abundance, and is now locally extinct in some areas (Shah 2006). The total population of Carnaby's Cockatoo is currently estimated at 40 000 (Johnstone & Johnstone 2008).

The species is confined to the south-west of Western Australia, north to the lower Murchison River and east to Nabawa, Wilroy, Waddi Forest, Nugadong, Manmanning, Durokoppin, Noongar (Moorine Rock), Lake Cronin, Ravensthorpe Range, head of Oldfield River, 20 km ESE of Condingup and Cape Arid; also casual on Rottnest Island (Johnstone and Storr 1998). There are small resident populations on the southern Swan Coastal Plain near Mandurah, Lake Clifton and near Bunbury. At each of these sites the birds forage in remnant vegetation and adjacent pine plantations (Johnstone 2008).

Habitat: Inhabits forests, woodlands, heathlands, farms. Carnaby's Cockatoos feed on seeds, nuts and flowers of a variety of native proteaceous species including *Banksia, Hakea, Grevillea, Allocasuarina, Eucalyptus and Corymbia calophylla* nuts, and seeds from the cones of *Pinus* spp. (Shah 2006). Pine (Pinus spp.) plantations in the coastal zone are now important feeding areas in the non-breeding season (Cale 2003).

This species is a postnuptial nomad, tending to move west with its young after breeding, often to non-breeding areas. In the non-breeding season (late spring to mid-winter), it congregates in large flocks of up to 15, 000 birds (Johnstone & Johnstone 2008). In some areas these flocks forage within 50 km of their breeding areas, whilst in other areas the flocks move to the coast, where heath, Banksia woodland and pine plantations are concentrated (Cale 2003). For example, most birds breeding in Three Springs, Carnamah, Coorow, Badgingarra, Dandaragan and Moora regions tend to move west after breeding into higher rainfall areas, especially the near-coastal Banksia woodland at Wanagarren Nature Reserve, Nilgen Nature Reserve, the Yanchep area (especially Yanchep National Park), Pinjar, Tamala Park and Gnangara areas, then many of these move further south onto the Swan Coastal Plain, including the southern Perth metropolitan area around Baldivis, Lake Clifton and Myalup (Johnstone & Johnstone 2008).

In the midlands region of the Wheatbelt and on the northern Swan Coastal Plain, pairs begin to move back to their breeding sites in July-August, some as late as mid-November (Johnstone & Johnstone 2008).

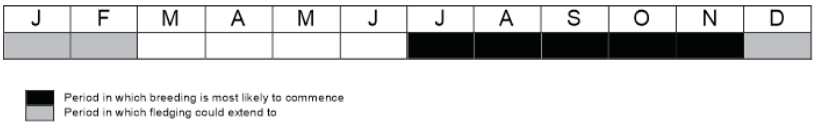
During February, March and April (and occasionally into May) large transit flocks of up to 7000 forage at major food sources, including Banksia or Kwongan heaths and Pinus plantations on the Swan Coastal Plain (Johnstone & Johnstone 2008).

Hollow Requirements: Carnaby's Cockatoo has specific nesting site requirements. Nests are mostly in smoothed-barked eucalypts with the nest hollows ranging from 2.5 to 12m above the ground, an entrance from 23-30cm diameter and a depth of 0.1 - 2.5m. On the Swan Coastal Plain, most nests are in Tuart (Johnstone & Storr 1998). Jarrah rarely produces hollows large enough for Black Cockatoos. From a database of 109 Black Cockatoo nest trees throughout the Jarrah forest only six are located in Jarrah (Kirkby 2009).

Breeding Season: Breeding occurs in winter/spring mainly in eastern forest and the wheatbelt where they can find mature hollow bearing trees to nest in (Morcombe, 2003). Judging from records in the Storr-Johnstone Bird Data Bank, this species is currently expanding its breeding range westward and south into the Jarrah – Marri forest of the Darling Scarp and into the Tuart forests of the Swan Coastal Plain including the region between Mandurah and Bunbury. There are small resident populations on the southern Swan Coastal Plain near

Mandurah, Lake Clifton and near Bunbury. At each of these sites the birds forage in remnant vegetation and adjacent pine plantations (Johnstone 2008).

Carnaby's Black-Cockatoo lays eggs from July or August to October or November, with most clutches being laid in August and September (Saunders 1986). Birds in inland regions may begin laying up to three weeks earlier than those in coastal areas (Saunders 1977). The female incubates the eggs over a period of 28-29 days. The young depart the nest 10–12 weeks after hatching (Saunders 1977; Smith & Saunders 1986).



Breeding birds generally feed within 6-10 km of the breeding site (Johnstone 2008) and no more than approximately 20 km (Saunders 1980), so having sufficient foraging resources close to the breeding area is critical to breeding success. Birds that foraged within one or two kilometres from nesting sites have the greater fledging success (Saunders 1980).

Likely presence in study area: The study area is within the current documented range of this species and it is probably a common, relatively frequent visitor to the general area.

Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*

Status and Distribution: Listed as Scheduled 1 under the *WC Act (1950)* and as Vulnerable under the *EPBC Act (1999)*. Found in the humid and subhumid south west, mainly hilly interior, north to Gingin and east to Mt Helena, Christmas Tree Well, North Bannister, Mt Saddleback, Rock Gully and the upper King River (Johnstone and Storr 1998).

Habitat: Eucalypt forests, feeds on Marri, Jarrah, Blackbutt, Karri, Sheoak and Snottygobble (Johnstone and Storr 1998).

Hollow Requirements: The Forest Red-tailed Black Cockatoo nests in the large hollows of Marri, Jarrah and Karri (Johnstone and Kirkby 1999). In Marri, the nest hollows of the Forest Red-tailed Black Cockatoo range from 8-14m above ground, the entrance is 12–41cm in diameter and the depth is one to five metres (Johnstone and Storr 1998)

Breeding Season: Breeding commences in winter/spring. There are few records of breeding in the Forest Red-tailed Black Cockatoo (Johnstone and Storr 1998), but eggs are laid in October and November (Johnstone 1997; Johnstone and

Storr 1998). Incubation period 29 – 31 days. Young fledge at 8 to 9 weeks (Simpson and Day 2004).

J	F	M	A	M	J	J	A	S	O	N	D

Period in which breeding is most likely to commence
Period in which fledging could extend to

Likely presence in study area: The study area is within the current documented range of this species and it is probably a common and frequent visitor to the general area.

Baudin's Black- Cockatoo *Calyptorhynchus baudinii*

Status and Distribution: Listed as Scheduled 1 under the *WC Act (1950)* and as Vulnerable under the *EPBC Act (1999)*. Confined to the south-west of Western Australia, north to Gidgegannup, east to Mt Helena, Wandering, Quindanning, Kojonup, Frankland and King River and west to the eastern strip of the Swan Coastal Plain including West Midland, Byford, Nth Dandalup, Yarloop, Wokalup and Bunbury (Johnstone and Storr 1998).

Habitat: Mainly eucalypt forests where it feeds primarily on the Marri seeds, (Morcombe, 2003), banksia, hakeas and *Erodium* sp. Also strips bark from trees in search of beetle larvae (Johnstone and Storr 1998).

Hollow Requirements: The cockatoos nest in large tree hollows, 30–40 cm in diameter and more than 30 cm deep (Saunders 1974).

Breeding Season: Baudin's Black-Cockatoo breeds in late winter and spring, from August to November or December (Gould 1972; Johnstone 1997; Saunders 1974; Saunders *et al*. 1985). Eggs laid in October (Johnstone and Storr 1998). Incubation is 28 – 30 days. Young fledge at 8 to 9 weeks (Simpson and Day 2004).

J	F	M	A	M	J	J	A	S	O	N	D

Period in which breeding is most likely to commence
Period in which fledging could extend to

Likely presence in study area: The study area is near the northern limit of this species documented range. This species probably visits the general area in low numbers on a relatively infrequent basis.

5. RESULTS

The extraction of gravel is to be carried out in two areas (gravel extraction area 1 and gravel extraction area 2 – see Figure 1).

Area 1 is about 29 ha in size and was found to contain about 23 scattered Jarrah and Marri trees in addition to two groves of trees. The northern most grove has an area of about 0.4ha, the southernmost about 1.0 ha. The groves of trees are dominated by Jarrah and Marri but also contain some Banksia specimens (*Banksia grandis* and *Banksia sessilis*)

Area 2 is about 18 ha in size and contains about 35 scattered Jarrah and Marri trees.

5.1 POTENTIAL BLACK COCKATOO NEST HOLLOW ASSESSMENT

Two trees within the study area (both in Area 1) were observed to contain hollows that, from ground level, appeared to have entrances of a size possibly suitable for black cockatoos to use for nesting purposes. No evidence of any hollow actually being in use or previously used by black cockatoos was seen. The location of the trees is shown in Figure 2.

Most of the trees present within the study site that could develop hollows (Jarrah and Marri) are all relatively young or stunted and do not appear to contain hollows of any size.

5.2 FORAGING HABITAT

Evidence of foraging by Carnaby's Black Cockatoo was observed within Area 2 in the form of chewed Marri seeds. Irrespective of the amount of actual foraging evidence observed most of the vegetation on site can be considered potential black cockatoo foraging habitat i.e. any Jarrah, Marri or Banksia tree/shrub.

5.3 ROOSTING HABITAT

Evidence of past use as a roosting site (significant concentrations of feathers and droppings) was searched for during the day time field survey. No evidence of previous roosting on site was observed. It is the Authors opinion that the site is probably not ideal as a roosting location due to the fact that most of the trees present are isolated single trees and/or are relatively small in size.

No black cockatoos were observed in or near the site during the survey work.

6. MANAGEMENT RECOMMENDATIONS

The most likely impacts of the of the proposed clearing works are

- Loss of potential nest hollows and foraging habitat;
- Potential for fauna to be killed or injured during clearing and ongoing operations at the site.

Overall the potential impact of the proposal on black cockatoos can be considered to be extremely low given the area of potential habitat to be cleared is small and there are only two potentially inhabitable trees. This can easily be more than offset through implementation of the revegetation program. Similar and better quality habitats are common and widespread in the general area (e.g. areas of State Forest). Existing black cockatoo populations using the general area (either on a permanent basis or as seasonal visitors) will not be significantly affected by the loss of this small area of habitat. The following recommendations are provided to further minimise the potential impact of the proposal and should be implemented if considered reasonable and practicable. It is recommended that:

- A revegetation plan should be formulated that includes the planting of local tree species and cockatoo food plants to offset the loss of potential black cockatoo habitat. (It is understood that a comprehensive revegetation plan has already been made and complies with this recommendation).
- During site works areas/individual trees requiring clearing should be clearly marked to reduce the likelihood of vegetation being removed unnecessarily.
- While the probability that any of the black cockatoo species utilises any trees within in the clearing footprint for breeding is very low, the documented breeding and fledging times of the respective species (see section 4) suggests that the best time to carry out clearing at the site would be in April/May/June so as to avoid the peak breeding times for all species in question. It would also be possible to carry out observations of potential nest hollows to establish if they were in use if clearing needed to be undertaken at other times.
- All staff working on site should be made aware that native fauna is protected by law. If feasible any fauna encountered should be relocated to suitable retained habitat nearby.

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(not necessarily cited)

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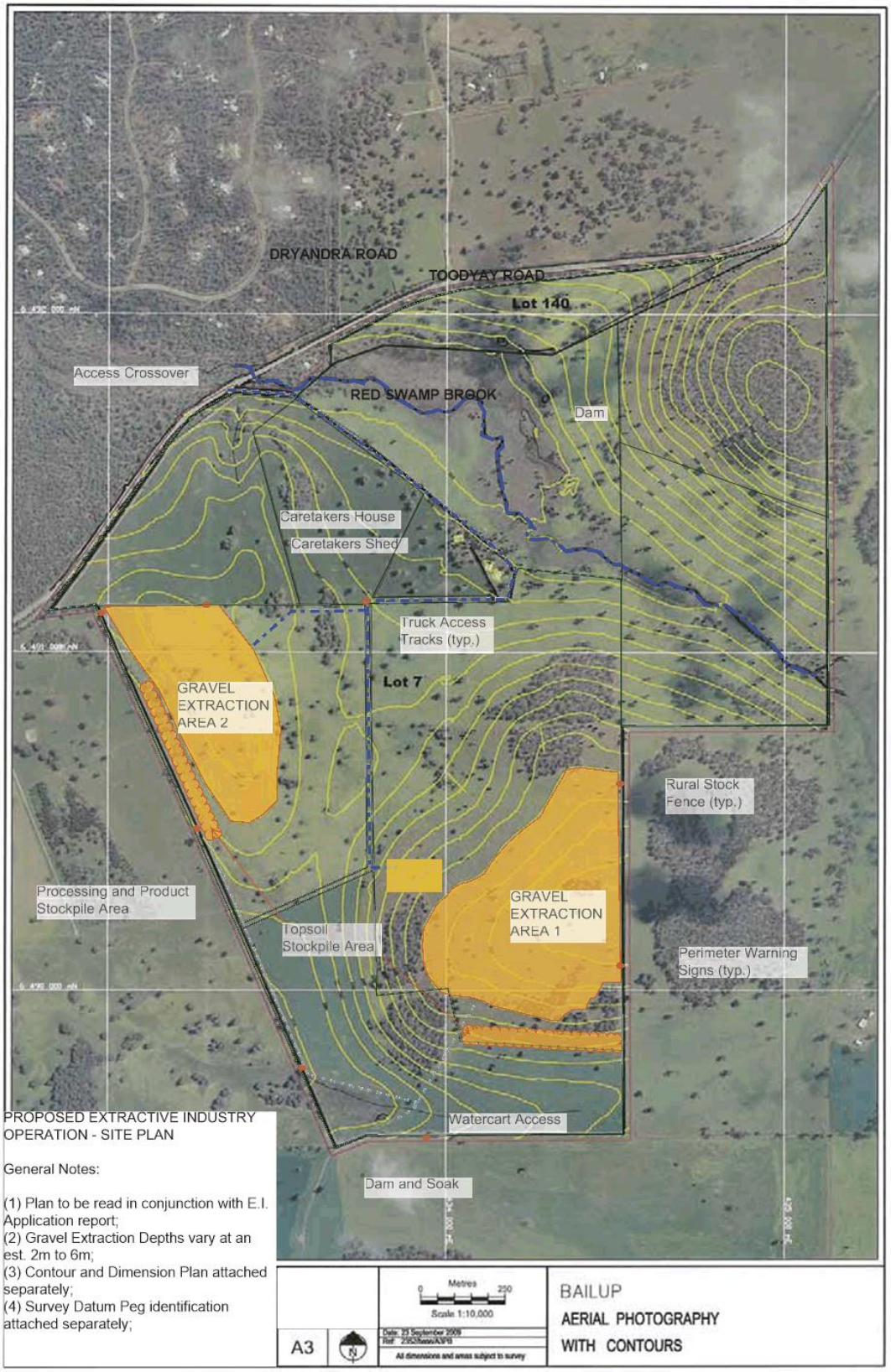
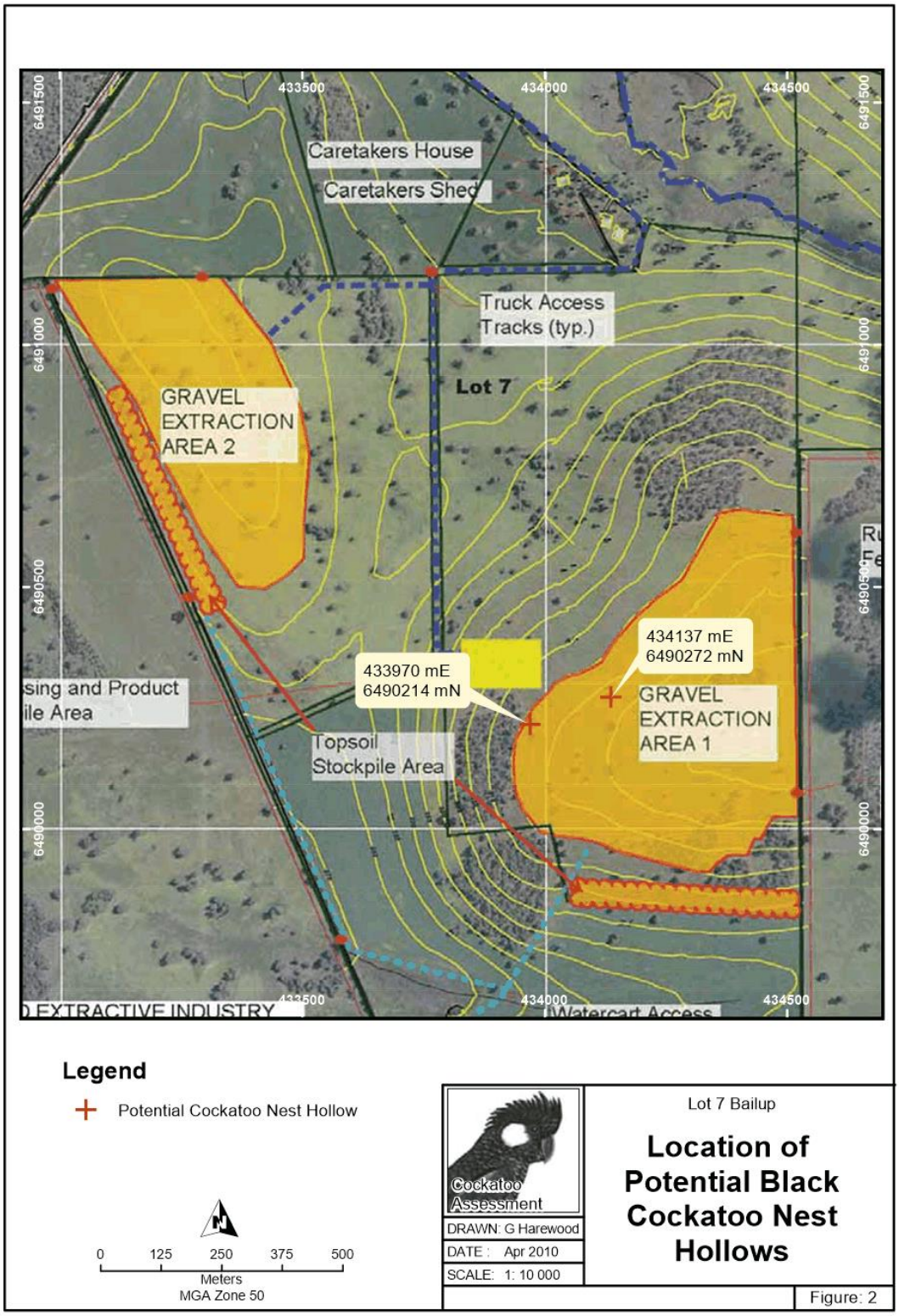
FIGURES


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
Access Crossover
RED SWAMP BROOK
Dam
Caretakers House
Caretakers Shed
Truck Access Tracks (typ.)
Lot 7
GRAVEL EXTRACTION AREA 2
Rural Stock Fence (typ.)
Processing and Product Stockpile Area
Topsoil Stockpile Area
GRAVEL EXTRACTION AREA 1
Perimeter Warning Signs (typ.)
Watercart Access
Dam and Soak
PROPOSED EXTRACTIVE INDUSTRY OPERATION - SITE PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Gravel Extraction Depths vary at an est. 2m to 6m;
(3) Contour and Dimension Plan attached separately;
(4) Survey Datum Peg identification attached separately;
Metres
0
250
Scale 1:10,000
A3
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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Caretakers House
Caretakers Shed
Truck Access Tracks (typ.)
Lot 7
GRAVEL EXTRACTION AREA 2
434137 mE
6490272 mN
433970 mE
6490214 mN
GRAVEL EXTRACTION AREA 1
Topsoil Stockpile Area
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ile Area
EXTRACTIVE INDUSTRY
Watercart Access
Legend
Potential Cockatoo Nest Hollow
0 125 250 375 500
Meters
MGA Zone 50
Cockatoo Assessment
Lot 7 Bailup
Location of Potential Black Cockatoo Nest Hollows
DRAWN: G Harewood
DATE : Apr 2010
SCALE: 1: 10 000
Figure: 2

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TRICO RESOURCES PTY LTD

GRAVEL EXTRACTION OPERATIONS

LOT 7 TOODYAY ROAD, BAILUP

CONSTRUCTION
NOISE MANAGEMENT PLAN

NOVEMBER 2016

REFERENCE: 20222-3-14245

DOCUMENT CONTROL PAGE

CONSTRUCTION NOISE MANAGEMENT PLAN

GRAVEL EXTRACTION OPERATIONS

Job No: 14245

Document Reference: 20222-3-14245

FOR

TRICO RESOURCES PTY LTD

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Author:	Paul Daly	**Checked By:**	Tim Reynolds
Date of Issue :	23 February 2016		

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1	Revision of time frames	03/10/2016	PLD	GW
2	Update of Construction Details	21/11/2016	PLD	GW

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CONTENTS

APPENDICIES

1. INTRODUCTION

Herring Storer Acoustics (HSA) was commissioned by Trico Resources Pty Ltd to prepare a Noise Management Plan (NMP), for the construction of a noise bund / access road for the proposed gravel extraction operations located at Lot 7 Toodyay Road, Bailup.

This report considers the potential impact and management of construction noise due to the construction of a 10 metre noise bund at the south west boundary of the site. The schedule for the construction works is 6 weeks from commencement. The commencement date is unknown at this time, although it is anticipated work will begin in August 2017.

Construction noise is regulated in Western Australia by the Environmental Protection Act 1986 and through it, the *Environmental Protection (Noise) Regulation 1997 (As Amended),* and hereafter called the Regulations. Specifically, Regulation 13 applies which refers to use of the Australian Standard AS2436-2010 "Guide to Noise and Vibration Control on Construction, Maintenance and Demolition Sites.

It is noted that at this stage it is anticipated that all the construction work would be carried out within the hours of 0700 and 1900 hours Monday to Saturday. However, if work is required to be carried out outside the above times, then a specific Out of Hours Noise Management Plan will be developed.

2. SUMMARY

There are no specific noise level criteria to be met for construction noise providing the work is carried out between 0700 and 1900 hours on any day which is not a Sunday or Public Holiday. It is a requirement that work be carried out in accordance with section 4 of AS2436-2010 and that equipment used is the quietest reasonably available.

Noise levels for the construction period have been calculated at the surrounding noise sensitive premises. Of the 7 premises considered, noise levels only exceed at one premises. The calculated noise level at this location has been determined to be 55 dB(A). Previous monitoring at the site has been conducted. This monitoring provided ambient noise levels, mainly attributable to the surrounding road network. Noise levels were recorded at an average daily L_{Aeq} of 53 dB(A).

The purpose of the construction works is to build a bund, which will form the necessary noise control for the above premise from noise associated with the proposed gravel extraction operations. Therefore, the construction works would be deemed necessary and the given the short duration of the works and existing ambient noise, would be considered the minimal impact possible.

Work can be undertaken outside the above hours, providing it is reasonably justified that the work is unavoidable. In such a case there is also a requirement for a management plan and that affected persons be advised and consulted in writing. For "out-of-hours" work a Noise Management Plan will be developed. For information, the basic requirements of a Noise Management Plan are outlined in Appendix B.

3. CONSTRUCTION PROCESS

3.1 Background

The purpose of the construction component for this project is to build an earthen bund, which provides the necessary noise attenuation for the proposed future gravel extraction operations. This bund is only necessary for the operations associated in Area 2, as operations in Area 1 comply with regulatory criteria without the requirement for noise attenuation. Figure 1 details the Areas of operations.

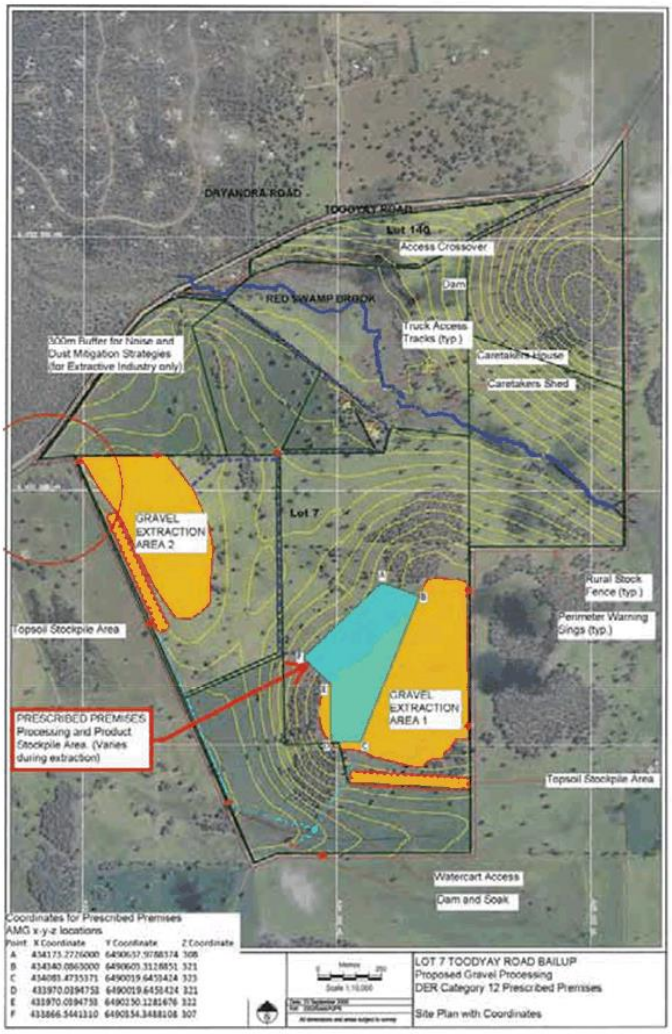


FIGURE 1 – AREAS OF PROPOSED GRAVEL EXTRACTION

3.2 Bund Requirements

As identified in the acoustic assessment for the gravel extraction operations (HSA *reference 18713-2-14245)* the bund is required to meet certain parameters in order for the noise levels for operations in Area 2 to comply at the neighbouring receiver. These parameters are outlined as follows with Figure 2 detailing the location:

- Height – 10m
- Length – 490m
- Volume – 58,800 m^3

Note: The above dimensions are based on an assumed 4m top width with a 2:1 side slope, hence a bund footprint of 20m.

FIGURE 2 – BUND LOCATION

3.3 Material / Construction Method

The undertaking by Trico for the bund construction is to limit the time the construction noise is present. This entails a campaign whereby the bund is constructed within a 6 week time period.

It is proposed that material for the bund is to be sought from the site. This is to be from two main areas within the premises, namely Area 1 overburden and any excess material from the development of the road and infrastructure for the site. Note, Area 2 will remain untouched until the bund is constructed.

The process for obtaining the required material will be to stockpile it in Area 1 over the course of operations within Area 1, until the required 58,800m^3 of soil is achieved. Once this volume is reached, the 6 week campaign will commence to shift the material into the required bund position. Noise levels for this 6 week period are outlined in Section 5.5 of this report.

Expectations are that the material will be transported from Area 1 to the bund location via the use of articulated dump trucks (CAT 740 or similar) with a dozer / loader (CAT D7 / CAT 988) used to push out the bund. Whilst this equipment has been assumed in the noise modelling, the contractor is yet to be appointed, hence a worst case (largest) equipment base has been used to allow for a conservative assessment.

4. NOISE LEVEL CRITERIA

4.1 Regulation 13 – Construction Sites

Noise assessment and impact in Western Australia are governed by the *Environmental Protection (Noise) Regulations 1997*. Within these, Regulation 13 addresses noise from construction sites. This Regulation does not provide specific noise levels which must be met but rather, provides management procedures to be followed as detailed below.

4.1.1 Normal Construction Hours

Where work is carried out between 0700 and 1900 hours on any day except Sundays and Public Holidays, then the assigned noise levels as determined under Regulation 7 do not apply and would be considered reasonable, provided:

- The construction work is carried out in accordance with Section 4 of AS2136-2010 Guide to Noise and Vibration Control on Construction, Maintenance and Demolition Sites.
- The equipment used is the quietest reasonably available.
- If a noise management plan was required to be prepared, then:
    1. The noise management plan (NMP) is prepared, given and approved by the Chief Executive Officer; and
    2. The construction work was carried out in accordance with the management plan.

Note :

1 Under sub-regulation (4), the Chief Executive Officer may require an occupier of a construction site on which it is proposed to carry out construction work to prepare a noise management plan in respect to the premises.

2 Councils have the delegated authority with regards to the *Environmental Protection (Noise) Regulations 1997* and for this project, the Chief Executive Officer referred to above is the Chief Executive Officer of the Mundaring Council.

4.1.2 NMP TO CONTAIN

Under sub-regulation (6), when a NMP is to be prepared in accordance with the Regulations of which, this report forms part of, and specifically this shall include but not to be limited to:

1. Details of, and reasons for, construction work on the construction site that is likely to be carried out other than between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday;
2. Details of, and the duration of, activities on the construction site likely to result in noise emissions that fail to comply with the standard prescribed under regulation 7 of the Environmental Protection (Noise) Regulations 1997 (provided in this report);
3. Predictions of noise emissions on the construction site (provided in this report);

4. Details of measures to be implemented to control noise emissions (provided in this report where necessary and/or practicable);

5. Procedures to be adopted for monitoring noise emissions (provided in this report); and

6. Complaint response procedures to be adopted.

4.2 Environmental Protection (Noise) Regulations 1997

The allowable noise levels at the surrounding premises are prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 & 8 stipulate maximum allowable external noise levels determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern.

TABLE 1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises within 15 metres of a dwelling	0700 - 1900 hours Monday to Saturday	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	35 + IF	45 + IF	55 + IF
Commercial	At All Times	60	70	80

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 2 below.

TABLE 2 - ADJUSTMENTS TO MEASURED LEVELS

Where **tonality** is present	Where **modulation** is present	Where **impulsiveness** is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

At the closest neighbouring noise sensitive premises, the Influencing Factor has been assessed as 0 dB, hence the assigned noise levels are as per Table 1.

5. NOISE MANAGEMENT PLAN

5.1 Normal Construction Hours

Where work is carried out between 0700 and 1900 hours on any day except Sundays and Public Holidays, then the assigned noise levels as determined under Regulation 7, do not apply and would be considered reasonable, provided:

5.2 Regulation 13(3)(A)

Australian Standard 2436-2010 "Guide to Noise and Vibration Control on Construction, Maintenance and Demolition Sites" Section 4 details generic methods for controlling noise emissions to surrounding areas and are detailed below:

5.2.1 Substitution (4.4.4)

The equipment which is to be used on this site would be the quietest reasonably available.

5.2.2 Modification of Existing Equipment (4.5.3)

Since the equipment is considered to be the quietest reasonably available and the majority of equipment are either hand tools or hired, any additional noise control (other than as already undertaken by the supplier) is not considered practicable or justified.

5.2.3 Maintenance of Equipment (4.5.5)

The equipment being used is subject to maintenance programs to ensure the machine is operating as designed. This includes making sure any noise control (such as mufflers etc) is correctly fitted and operating at its designed performance.

5.2.4 Controlling the Spread of Noise (4.6)

The location of construction work is limited by the constraints of the. No bunding or temporary fencing is considered practicable in this instance.

Therefore, it is considered that Regulation 13(2) is being satisfied.

5.3 Complaints Response Procedure

Even though the work will be performed during normal working hours, it is recommended that a complaints response procedure be adopted, which generally be as follows :

A log book will be kept of all complaints stating:

1 Where the complaint was from.

2 The source of complaint.

3 Where the equipment operating.

4 If a verbal response was given to the resident, what was it and was the resident satisfied with the response.

5 Did Trico personnel go to the property to discuss the complaint and what was resolved at this point.

After the complaint has been received and responded, noise emissions from the offending item(s) of equipment should be investigated. If noise level from offending item are found to the excessive, then the item will either be repaired, replaced with quieter item or noise control applied.

5.4 Out-of-Hours Construction

It is not anticipated that construction work will be required 'out-of-hours', however, if necessary a NMP will be developed. The requirements for a noise management plan are outlined in Appendix B.

5.5 Noise Levels

Calculations of noise levels from the construction activities have been based on predictive noise modelling using the proposed equipment's noise emissions. Receiver locations have been based on the closest noise sensitive premises in relation to the site.

Expectations are that the material will be transported from Area 1 to the bund location via the use of articulated dump trucks (CAT 740 or similar) with a dozer / loader (CAT D7 / CAT 988) used to push out the bund. Whilst this equipment has been assumed in the noise modelling, the contractor is yet to be appointed, hence a worst case (largest) equipment base has been used to allow for a conservative assessment.

Table 3 details the equipment sound power levels used, with Table 4 providing the resultant noise level at the neighbouring premises.

TABLE 3 – EQUIPMENT SOUND POWER LEVELS

Equipment Description	Sound Power Levels dB(A)
Quarry Truck (CAT 740) (2 off)	106
Front End Loader (CAT 988H) (1 off)	105
Dozer (CAT D7) (1 off)	109

Results of the calculated noise levels have been summarised in Table 4. Noise levels have been assumed to contain tonal characteristics.

TABLE 4 – ASSESSMENT OF NOISE LEVEL EMISSIONS L_{A10}

Receiver Location	Calculated Noise Level
A	36
B	55
C	34
D	32
E	27
F	27
G	16

Appendix B contains noise contour plot of the operating scenario.

Previous monitoring at the site has been conducted. This monitoring provided ambient noise levels, mainly attributable to the surrounding road network. Noise levels were recorded at an average daily L_{Aeq} of 53 dB(A).

5.6 Management Plan

For all equipment, general management practices are recommended as follows: -

- Ensure the quietest reasonably available equipment is used.
- Ensure all equipment is maintained in near new condition and in particular, any factory fitted noise controls are in place and in order i.e. exhaust silencer, enclosures etc.
- Unless absolutely necessary carry out work between 0700 and 1900 hours on any day which is not a Sunday or public holiday.
- The bund construction will be conducted in a 6 week campaign.
- Material will be stockpiled in Area 1 until the required amount is available to construct the bund.

Specific noise controls that have been incorporated by Trico to minimise noise emissions include:

- Location of equipment as far as practical away from the neighbouring residence.
- Working hours being between 0700 and 1900 hours Monday to Saturday.
- Minimised construction timeframe (6 weeks).

If activities are required outside the above times, then a NMP as outlined in Appendix B will be developed.

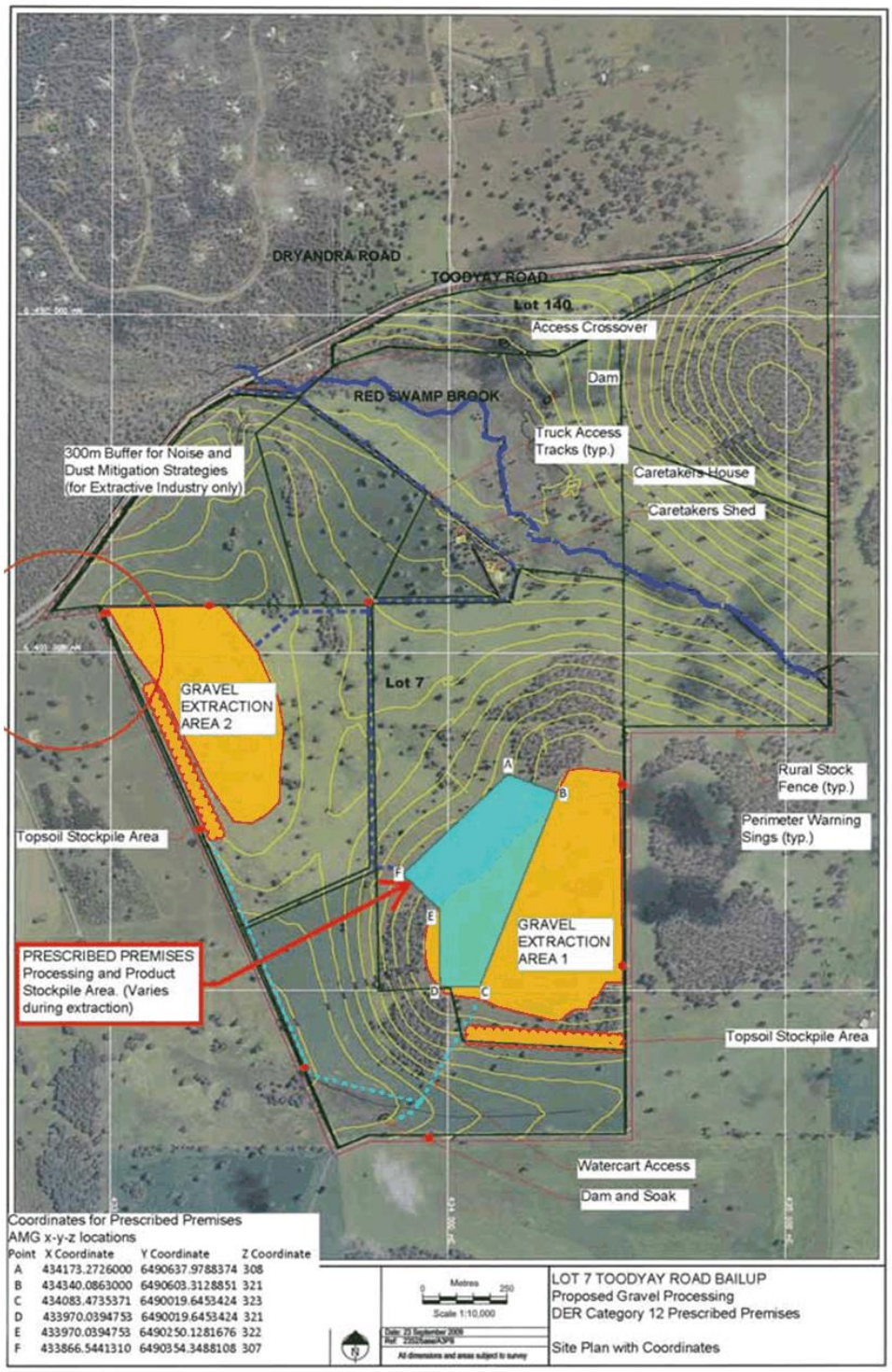
For this NMP during normal working hours, it is not recommended that monitoring be carried out.

6. CONCLUSION

The management procedures detailed in this report must be adhered to in order to comply with the Regulations. These procedures for day time construction are to carry out work in accordance with AS2136-2010 and to ensure the quietest reasonably available equipment be used.

APPENDIX A

LOCATION PLAN


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
Access Crossover
Dam
RED SWAMP BROOK
Truck Access Tracks (typ.)
300m Buffer for Noise and Dust Mitigation Strategies (for Extractive Industry only)
Caretakers House
Caretakers Shed
GRAVEL EXTRACTION AREA 2
Lot 7
Rural Stock Fence (typ.)
Perimeter Warning Sings (typ.)
Topsoil Stockpile Area
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
GRAVEL EXTRACTION AREA 1
Topsoil Stockpile Area
Watercart Access
Dam and Soak
Coordinates for Prescribed Premises
AMG x-y-z locations
Point X Coordinate Y Coordinate Z Coordinate
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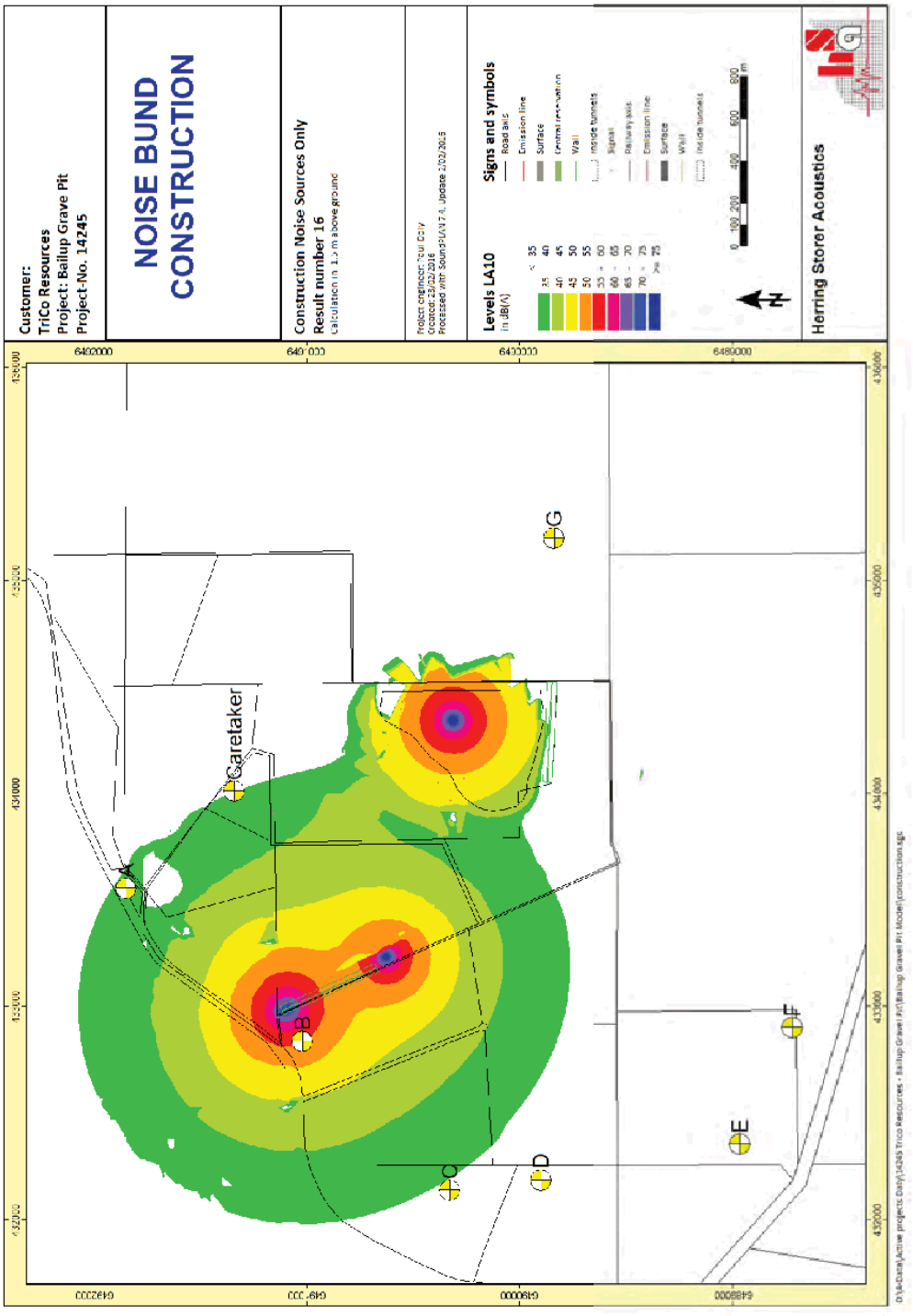
B 434340.0863000 6490603.3128851 321
C 434083.4735371 6490019.6453424 323
D 433970.0394753 6490019.6453424 321
E 433970.0394753 6490250.1281676 322
F 433866.5441310 6490354.3488108 307
Metres
0 250
Scale 1:10,000
LOT 7 TOODYAY ROAD BAILUP
Proposed Gravel Processing
DER Category 12 Prescribed Premises
Site Plan with Coordinates

APPENDIX B

CONSTRUCTION NOISE RESULTS

CONSTRUCTION ACTIVITIES – NOISE CONTOUR PLOT



Herring Storer Acoustics
Our Ref: 20222-3-14245

DUST MANAGEMENT PLAN

for

TRICO RESOURCES PTY LTD

at

Lot 7 Toodyay Road, Bailup

***Amended 10 August 2016**

Prepared by:
TriCo Resources Pty Ltd
PO Box 1008 Osborne Park WA 6916

EXECUTIVE SUMMARY

This *Dust Management Plan amended 10-Aug-16* is prepared on behalf of TriCo Resources for the proposed development at Lot 7 Toodyay Road, Bailup ("the Site"). It forms part of the Department of Environmental Regulation (DER) Works Approval W5917/2015/1 for a Category 12 *prescribed premises.*

The proponents have sought and obtained Planning Approval and LGA Extractive Industry license from WAPC and the Shire of Mundaring respectively. Through the application process, a revised set of *Management Plans* were developed and approved to govern protection measures during proposed activity. This included a Dust Management Plan.

In consultation with DER, application was made for A Category 12 *prescribed premises* under Part V of the Environmental Protection Act. A works approval has been granted by DER (W5917/2015/1) and includes an improvement requirement IR2 for the *Dust Management Plan dated 10 Sep-2014* which was approved by WAPS and LGA. IR2 required that the Works Approval Holder submit a *revised* Dust Management Plan to include additional information on complaints handling and a dust monitoring program.

This *Dust Management Plan amended 10-Aug-2016* addresses the improvements required by DER.

Table of Contents

DUST MANAGEMENT PLAN

1 BACKGROUND & SITE DESCRIPTION

TriCo Resources ("the proponent") have sought a Works Approval from the Department of Environmental Protection ("DER") for a Category 12 Prescribed Premises *Screening etc. of material: premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated"* at Lot 7 Toodyay Road, Bailup ("The Site"). A Draft Works Approval has been issued by DER (#W5917/2015/1).

The site has already been granted WAPC planning approval and an LGA Extractive Industry license for the proposed works.

The site comprises of Lot 7, which is approximately 375.79 hectares of *rural* zoned land.

The majority of the site has been historically cleared and used for many decades for cropping and grazing. Some large clusters of natural vegetation, in the form of trees and shrubs, are found in various locations. Other isolated trees are located sporadically elsewhere.

The topography is generally gentle with relativity flat to moderate grades which elevate the land from approximately RL 265 AHD to RL 338 AHD. The land form rises in the south, west and east and is divided by Red Swamp Brook running southeast to northwest through the northern central portion of the property. The site is not considered at risk of flooding. Red Swamp Brook is recognised as a constrained area and this feature is therefore protected from the proposed development.

The site is boarded to the north by Toodyay Road for approximately 2.8 kilometres. Toodyay Road is the primary road access for the site. Lot 140, which borders most of the northern boundary is also owned by the same entity as Lot 7.

A dwelling is located central north in the valley where Red Swamp Brook runs north under Toodyay Road. The other neighbouring land holdings are large, undeveloped, rural landholdings to its west, east and south which have been predominantly cleared for rural use. Further north are semi-rural residential properties nested amongst dense native vegetation.

There are two dwellings which DER have deemed to be at risk from emissions. They are:
- 445 Squarcini Close (0.2 km West of the site) ["dwelling B"]; and,
- 3650 Toodyay Road (0.84km East of the site) ["dwelling G"].

Extractive Industry is proposed at 2 locations which total approximately 42 hectares in size. Processing of material (crushing and screening) shall occur in a depression midpoint between the two extraction areas. Works shall be progressive with up to 8 hectares under operation at any one time, and for rehabilitation to be progressive during the life of the project.

2 PURPOSE OF THIS MANAGEMENT PLAN

Proposed Extractive Industry activities are of an earthworks nature, which is recognised as a ground-disturbing operation which can create emissions.

The recognition of potential adverse impacts from noise, dust, clearing and other elements requires the proponents to appropriately manage those things. This *Dust Management Plan* discusses these potential social and environmental risks arising from dust emission and prescribes on-site control and management processes accordingly.

Draft Works Approval W5917/2015/1 sets out the requirements of the proponent, including dust management to be in accordance with a Dust Management Plan dated 10-Sep-2010, which IR2 requires to be revised and issued to the CEO to including information on:

a) complaints management including recording of all complaints, investigation and remedial actions; and
b) a dust monitoring program including details on;
   - continuous dust monitoring at the boundary that has automatic feedback (SMS or equivalent) if a pre-set trigger value is reached;
   - meteorological monitoring to provide wind data to assist in determining the source of dust;
   - sampling locations at the Premises boundary between operations and residences B and G as depicted in Schedule 1;
   - trigger values to evoke actions to manage dust generation;
   - management actions and timeframes in the event of a trigger values being reached including consideration of wind speed and direction and whether the exceedance is attributable to 3650 Toodyay Road.

For clarity, "residences B and G" are those detailed in section 1.1 above.

In brief, the proposed areas of activity are:

- isolated from dwellings, other than residences B (0.2km) and G (0.84km) [Buffer Distance];
- hidden from adjacent land holdings', dwellings' and thoroughfares' line-of-site by undulating land topography and existing vegetation [Visual Impairment];
- moderately screened from prevailing winds by existing dense clumps of natural (and tall) vegetation, which are to be protected [Natural Protection];

Recognised and industry standard practises for dust control are well-established across Australia. Those methods are proposed to be utilised at the Site to suppress dust and reduce the risk of adverse wind-born dust lift-off.

Predicted activities creating *dust risk* are:

- exposing un-stabilised and non-vegetated soils to prevailing winds;
- carrying, loading and stockpiling soils;

- wheeled plant movements over un-stabilised surfaces, including cartage tucks travelling on gravel tracks to and from The Site.

Management of these activities are an effective way to prevent adverse effects of dust. The purpose of this Management Plan is to review the risks and control measures to appropriately manage dust and mitigate its impact. Site managers and personnel shall be instructed on Dust Management issues outlined in this document.

This *Dust Management Plan Amended Aug-2016* incorporated the required amendments and is issued to the CEO as required.

3 AUTHORITY REQUIREMENTS

As commented in the LGA Officers' Report, File Code To3.3650 11-May-10, "Dust is to be managed in accordance with the Health Act 1911 and the Shire's Health Local laws 2003."

The Health Act 1911 prescribes the need for industry to mitigate the impact of "offensive matter" which includes "dust". The potential impact of dust from extractive industry on sensitive premises needs to be investigated and appropriate management plans implemented.

The Shire of Mundaring Health Local Laws 2003 does not specifically address dust created from construction or activities similar to those proposed by extractive industry, over and above The Health Act 1911.

DER also require dust to be managed in complained with the Health Act.

This Dust Management Plan considers the potential impact, control mechanisms and action plans for day-to-day mitigation of dust and its impact on the surrounding environment.

4 DUST MANAGEMENT

Recognising the potential dust-creating activities, a number of key management practises and procedures are to be implemented. This Section describes those dust control measures in detail. However, the day-to-day implementation is a matter of on-site management considered daily events. Therefore, a matrix of events versus on-site action is found at Appendix 1D to prescribe when different dust control measures are to be used.

4.1 MONITORING OF WEATHER CONDITIONS

Dust created and/or carried by prevailing winds is the primary culprit of dust problems. Strong winds can create dust lift-off from exposed un-stabilised surfaces. Localised dust created from activities such as lifting and handling soils are also carried by winds. Vehicle traffic along unsealed roads causes dust lift-off, which is not a nuisance unless carried by prevailing winds.

Therefore, weather and wind conditions must be monitored. Generally, no wind means minor dust nuisance; high wind cause dust to travel off site. The direction and speed will vary that effect.

Wind influence is also related to rain events. Natural dust suppression shall be considered on a day-to-day basis. Rain events will wet unsealed surfaces and naturally prevent dust lift-off. This manages both the potential nuisance and negates the need for drawing of water from the allocated water source and employing watercarts for dust control.

Bureau of Meteorology and other weather forecast services are to be used by site supervisors to assist in issuing day-to-day instructions relating to dust control and if necessary temporarily suspend works. If strong winds are predicted, or are experienced, then appropriate and additional dust control measures are to be implemented to ensure that dust is not excessively carried off the works area.

Furthermore, onsite, real-time weather monitoring stations can provide assistance in identifying if dust complaints, or dust events captured on monitoring systems are attributable to the site.

4.1.1 Bureau of Meteorology Data

Rose of Wind direction versus Wind speed and *Median Rainfall data* is found at Appendix 1E. This data compiled over 45 years from the nearest weather monitoring station, provides the following relevant information is demonstrating potential dust impact from the site to dust sensitive premises:

- Wetter period (May through September):
  - This is the period of greatest rainfall which will create natural dust suppression in lieu of using a watercart
  - Morning wind speeds are recorded as calm for approximately half of all days and otherwise predominantly very low
  - Afternoon wind speeds are approximately 11% calm while otherwise are predominately low (0 to 10 kph).
  - Wind direction is even throughout the dial, although afternoon winds are recorded more regularly in a west-northwest direction.

- Drier period (October though April):
  - This is the drier period of the year with less regular rainfall and manual application of water would be necessary for dust suppression
  - Morning wind speeds are approximately 13% clam as calm and otherwise very from 0 to 20 kph and up to 30 kph
  - Afternoon wind speeds are approximately 8% calm while otherwise are predominately low to moderate low (0 to 30 kph and up to 40 kph).
  - Wind direction is generally southeast and east in the morning while recorded predominantly east through to southwest in the afternoon

Rose recording of wind direction provides the following conclusions:

- During wetter months rainfall will assist in daily dust suppression, reducing the needs for drawing water and applying with a watercart
- During wetter months wind speeds is often 'calm', or otherwise low.
- During wetter months wind direction in a northerly direction is encountered much less frequently.
- During drier months, low rainfall will create the need for regular use of a watercart to suppress dust on exposed, un-stabilised surfaces.
- During drier months, wind is encountered more regularly and at a greater speed than wetter months. Wind direction is predominantly south, southwest and west in the morning and across the southern part of the dial in the afternoon.

Therefore, a *Wind-Rose* analysis demonstrates that impact to dust sensitive premises is low and often reduced by the prevailing winds. Of the sensitive receptors, dwelling B and G are located within a distance where dust control will be most important. The monitoring and management of dust will need to specifically consider dwellings B and G.

Dust management shall always be a day-to-day operational consideration as rainfall, wind direction and wind speed vary daily.

4.2 MONITORING OF DUST

There are two dwellings which DER have deemed to be at risk from dust, being the closest to eh works area. They are:

- 445 Squarcini Close (0.2 km West of the site) ["dwelling B"]; and,
- 3650 Toodyay Road (0.84km East of the site) ["dwelling G"].

DER requires that real-time, continuous, remote dust sampling stations be located on the site boundaries between operational areas and residences B and G. Furthermore, an on-site weather station is be setup to provide meteorological monitoring to asset in determining the source of dust should a trigger-value event occur.

Section 2.4 of DER's "A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities" states:

> *"Particle size Human health effects of dust tend to be associated with particles with an aerodynamic diameter of 10 µm or less (≤ PM_{10}). These smaller particles tend to remain suspended in the air for longer periods and can penetrate into the lungs. "*

Based on the site characteristics and distance to receptors from the boundary *trigger-value* for a dust event is 0.5 mg/m^3.

Dust monitoring shall continuously sample air quality and provide notification if the trigger value is reached. Notification is to be made with SMS or other equivalent method, to the site foreman responsible for the implementation of dust control measures. Monitoring

devices must also produce data logs which can be interrogated in the event of a dust complaint.

Prior to the commencement of ground engaging activities associated with the proposed gavel extraction, the proponent shall ensure that:

(a) Continuous dust monitoring devices (*Dustrak II Aerosol Monitor* or equivalent) are located between Extraction Area 1 and dwelling G (Station 101); and between Extraction Area 2 and dwelling B (Station 201) as depicted in the Dust Monitoring Station Location Plan at Appendix 1F;
(b) At least one of the dust monitoring stations has a real-time weather station to monitor meteorological data – specifically wind speed and direction;
(c) Data to be logged for retrieval (remove download or internet connection);
(d) Dust monitoring stations to be equipped with SMS or equivalent automatic feedback to a duly authorised person should a trigger level dust event occurs. Monitoring of dust to be for particle size of 10 µm or less with a trigger-value concentration of 0.5 mg/m^3.

Should a trigger-level event occur, the authorised person (or site foreman) shall determine if dust is being generated from the site activities. This includes visual inspection of the works area (if on site during activity) and checking meteorological data. The use of meteorological data shall be considered as follows:

- If Station 101 reaches trigger value AND wind is west-northwest, then dust is likely caused from site activity. Action to be taken.
- If Station 201 reaches trigger value AND wind is east-southeast, then dust is likely caused from site activity. Action to be taken.

In either event, the site foreman (or other duly authorised person) shall that the appropriate action as detailed in section 4.3 and 6 and Appendix 1C and 1D of this DMP.

4.3 DUST SUPPRESSION & PREVENTION

Dust suppression is the management of activities and aspects on The Site which cause dust lift-off. Those aspects are detailed below and prescribe management processes to mitigate dust nuisance. However in all of these, seasonal influence will decrease or increase the case-by-case needs. For example, dry seasons will reduce the effectiveness of water suppression; windy periods will increase the distance of dust escape; wet seasons will generate natural dust suppression.

4.3.1 Exposed Surfaces and Traffic

Soil stockpiles, un-stabilised surfaces and areas under traffic (including internal roads used by trucks) will be suppressed with water applied by appropriate machinery kept on site full time ('watercarts'). Water is available from a localised soak and adjacent dam in the south-west corner of The Site. Volumes of water used will be dependent on the prevailing weather conditions, however, minimised to reduce waste, erosion and

machine use. Wind speed, direction, location and point of influence shall determine site specific decisions for where water shall be applied. Section 5 of this document describes the water source proposed and discusses its limitations.

More permanent stabilisation of surfaces (primarily those areas being rehabilitated) shall be employed in lieu of on-going application of water. These are discussed in Section 6 of this document.

4.3.2 Soil Transport Off Site

Material exported off The Site (gravel) will be carried in truck bodies of various size and configuration – generally open-top, tipping trailers. During transport, dust can be lifted out of these open trailers and cause nuisance and other problems along the travel route from The Site to delivery destination.

Two industry standards have been in effect which either/or shall be used for all loaded trucks leaving the Site:

- Gravel shall be wet after being loaded.
- Truck loads shall be covered with suitable tarpaulins.

4.3.3 Processing material

Crushing, screening and stockpiling gravel will be undertaken by fixed temporary plant and can cause dust pollution when soils are elevated and moved. Thoughtful location of the processing plant can greatly reduce wind-influence.

The processing plant shall be established at a location having the greatest wind protection within close proximity to the extraction area. Located at lower ground levels and concealed by nearby existing clumps of dense vegetation will screen gravel which is being processed from wind. Close proximity shall also reduce the time gravel is exposed to wind during transportation within The Site. Refer to Location Plan found at Appendix 1A.

Site supervision shall still have the authority and responsibility to suspend works should wind still adversely impact the processing plant.

4.3.4 Road Sealing

The crossover for The Site has been proposed at the existing access onto Toodyay Road. This location has been accepted by MRWA with condition for an intersection upgrade. In conjunction with the intersection upgrade, the adjacent portion of the internal gravel road shall be sealed with a bitumen and aggregate surface treatment. For a length of 70 meters, this portion of sealed road will encourage the removal of dust from vehicle wheels before traversing Toodyay Road. This shall mitigate dust moving off site and affecting Toodyay Road and its users.

5 WATER USAGE

Although dust control is managed by a number of key operation activities (described above), the primary mechanism for dust control is by the application of water over exposed surfaces. This requires a suitable water source.

5.1 WATER SOURCE

Water for dust suppression is proposed to be taken from a dam located in the south-west corner of The Site as detailed in the EIL Application 20-Oct-09, refer to location plan found at Appendix 1A. This is recognised as a suitable, safest, cheapest and least impacting source.

The existing dam is located on the eastern side of an isolated low-lying area where approximately 2.5 hectares is either waterlogged or has water ponding on the surface (often termed a 'soak'). Adjacent elevated landforms with dense surface and underlying soils direct stormwater to this low-point. There are several trees located on the boundary of The Site in this area and further west is a small group of trees. The surrounding land is used for cropping and grazing. There are no near-by areas of significant vegetation or bushland susceptible to significant fluctuations in surface water. This wet area is completely separate from Red Swamp Brook. It is not and does not form any type of creek or river system.

Department of Water has been consulted regarding taking of water and concur with the above conclusions. They have not placed any conditions on the development and have confirmed that the proponent "does not require a licence [to regulate consumption] as water is being taken from an existing dam/soak which is not creek or bore fed."

5.2 WATER VOLUMES REQUIRED

An estimate maximum volume of water required to be taken from the dam for dust suppression is as follows:

During Dry/summer:	up to 9 loads per day (1 load per hour)
During Wet/winter:	down to nil loads per day
Volume of watercart:	10 kilolitres
Estimated days of watercart operation:	100 days per year
Estimated average daily use:	45 kilolitres
Estimate annual use:	4,500 kilolitres

These volumes are an estimated maximum consumption, however other factors will reduce the requirement to take water and include:

- during days where The Site is not in operation such as public holidays;
- during periods where sales and depressed market factors required the temporary closure of The Site;
- the use of alternative forms of dust control as detailed in Section 2.6.

5.3 ASSESSMENT OF CAPABILITY AND ENVIRONMENTAL IMPACT

The impact of taking water from this dam on the surrounding area can only be estimated. However, some circumstantial information can be considered to ascertain if the water required to be taken would be considered a 'significant volume' or a 'significant impact'. That being:

- The shallow water table (or localised shallow spring) penetrates the surface in this area and ponds on the surface. Water appears to enter the dam from the underlying surface and localised ponding. Catchment from the surrounding hills direct stormwater overland and subsurface to this adjacent low-point where sufficient water volumes breach the surface.

- An area of approximately 2.5 hectares is waterlogged and inaccessible by vehicle. Some water travels overland west but quickly re-enters the ground as there is no clear depression or identifiable creek-line.

- Surface water is created by a localised catchment and affected by a shallow, superficial water table. Collection of overland and subsurface water flow from adjacent elevated land directs water to this location. Catchment water volumes are estimated in the millions of kilo-litres and are affected by a multitude of variables. They are also affected seasonally such as the winter increase in the water table which expands the size of the waterlogged surface. Refer to Hydrologist Report found at Appendix 1B for more detail.

- There is no water course, creek, wetland or other special environmental concern nearby. Water which penetrates the surface and ponds in this area is confined to the area. There is no evidence of a spring fed creek-line and it is not linked to Red Swamp Brook.

As the low area is likely to be a point with which the local water catchment protrudes the surface it is not feasible to measure the volume of water which may be encountered. Estimates of catchment has been made and found at Appendix 1B. Suffice to say, perched and local water tables can be affected by subsoil drains, earth working land forms and performing dewatering or other temporary water taking activities. The sorts of activities which are temporary in nature and not considered to be large volumes, such as 4,500 kL per annum, would do little to affect the localised ground water impact.

Ground water mapping and other exhaustive water monitoring would need to be undertaken for multiple seasons to obtain an estimate of maximum and minimum levels and would not demonstrate volumes to a degree of accuracy which would identify drawing 4,500kL over the whole of the year. *The volume proposed to be taken is simply not significant.* Being shallow/superficial, any data collected would not be suitable for relevance over subsequent years.

Shallow aquifer groundwater is, by nature, encountered in large volumes. Water extraction from the surface would bear little to no impact as the existing dam would simply recharge

with the ground water from the immediate area. The rate of recovery would vary by the soil type, topography and head-pressure of underground water.

A recent study undertaken by a Hydrogeological Consultant concurs with the above assessment of the water availability and concludes:

> *"The groundwater causing the waterlogged area around the soak/dam should be capable of supplying 4,500kL per annum based on the rainfall recharge calculation."*

A full copy of the Hydrogeological report is found at Appendix 1B

6 ALTERNATIVE DUST CONTROL MEASURES

Although the identified water source has sufficient capacity and capability, because exact available volumes are unknown during seasons where water is more often required to be drawn for dust control (summer), this management plan identifies provisions for alternative dust control measures which reduce the requirements for drawing water and are a back-up should water be temporarily unavailable from the proposed dam.

6.1 HYDROMULCHING AND SEEDING

The proposed extractive industry operation is staged. Sections of the pit are mined in stages up to 8 hectares at a time and then rehabilitated in a manner befitting efficient operation, but minimising the nett area of disturbed surface. Dust control includes the need to mitigate dust lift-off from areas which are rehabilitated but not yet revegetated sufficiently to naturally stop dust nuisance.

The application of a paper-water mixture to bare soil surfaces is used to create a temporary crust and prevent wind-borne dust lift-off. The addition of grass seeds within hydromulch can increase the population of native vegetation germination where applied. Hydromulch is suitable for large areas that are not trafficked or disturbed and allow for the eventual overgrowth of grasses which then form a permanent soil stabilization and dust control mechanism.

Seasonal weather permitting, direct seeding of native or other grasses suitable for the return to rural agricultural activity can be an effective long-term stabilisation plan. Once topsoil is respread over completed extractive industry stages, those areas not revegetated with trees and shrubs can be sown with seeds during winter/spring season which will allow germination and stabilisation of the surface. Species of seed shall be selected after consultation with the Shire of Mundaring Environmental officer.

The revegetation management plan for the proposed Extractive Industry includes on-going monitoring to ensure that revegetation, including dust control measures detailed above, are successful, and if necessary, require on-going or repeat action.

6.2 WATER ADDITIVES

An alternative to Hydromulching, and used for temporary stabilisation of gravel roads, are water 'additives' which superficially penetrate the gravel surface and coagulate as water evaporates to leave a starch-like bond of the surface. Acting as a bonding agent, fine gravel particles are held from becoming air-borne. This is a temporary alternative with its effect determined by traffic volumes.

The effect is that water consumption can be reduced. The use of water additives is an available all-year-around option for The Site supervisor when considering the number of vehicle movements as well as the volume of water available at the water source, should the dam recharge rate be too slow.

Although this alternative does not completely negate the need for water, it can reduce the amount of water required. Listed as an 'alternative', water additives are likely to be used nonetheless, subject to satisfactory supplier demonstration for the works proposed.

6.3 SUSPENSION OF WORKS

Operation of the Extractive Industry is managed day-to-day by an on-site manager. His/her responsibility shall include the recognition of dust control and the mitigation of dust nuisance to the greater environment.

Armed with the dust control measures described in this management plan, an all-authoritative back-up for adverse dust nuisance condition shall be to temporarily suspend works causing the dust problem.

In the same manner, complaints and order to stop work are enforceable under the governing laws which mandate dust control must be undertaken to the satisfaction of the regulatory authorities.

6.4 OTHER ALTERNATIVES

Storage of excess winter water in holding tanks is unviable as massive water tanks would be necessary and are an inefficient and expensive option to the existing dam/soak which historically holds water all year. Minor engineering of that dam, including deepening and formalising its shape will help concentrate localised water to an efficient reservoir expected to contain sufficient water for the proposed activity's needs.

The proponents are also permitted to apply for a water bore through the appropriate regulatory authority should this be an option of last resort to obtain water for dust control purposes.

7 COMPLAINTS PROCEDURE

Complaints from approved extractive industry generally apply to the escape of noise and dust pollution. Odour pollution is not a product of excavating and crushing gravel.

Complaints made to the operator/licencee will be documented and dealt with expeditiously.

Complaints received either directly from the complainant or via an authority will be reviewed by the operator and interested parties to assess:

- the legitimacy of the complaint;
- the aspects of the operation that triggered the complaint;
- management actions required to address the issues raised to bring operations into line with conditions imposed under the Extractive Industries Licence;

Actions deemed necessary to comply with relevant legislation, regulation and licence conditions will be undertaken immediately. If necessary, works will be suspended until appropriate rectification has occurred.

Summaries of complaints and action taken to address each specific issue will be recorded in a Complaint Report (found at Appendix 1G). The Complaint Report shall document the following:

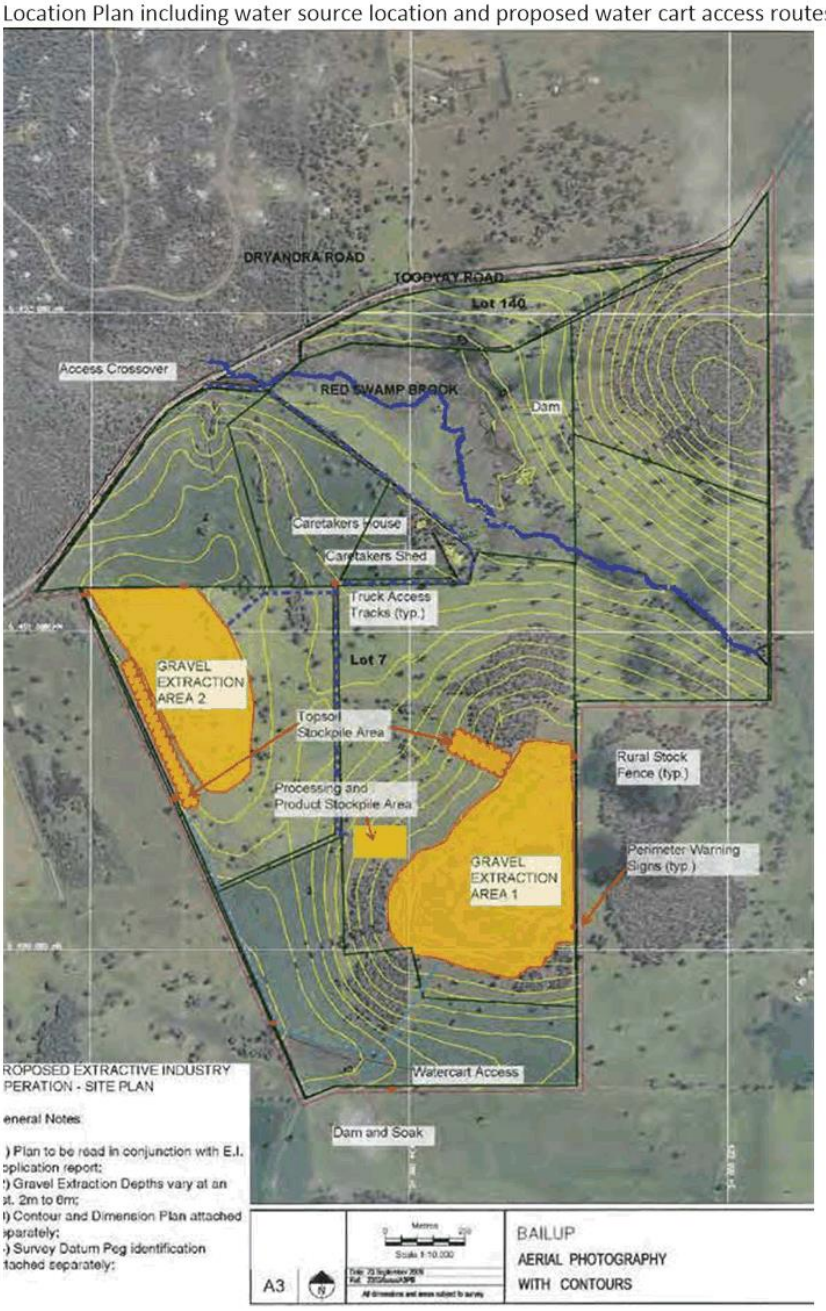
a) Investigation:
   - Details of site, location, licensee and operator;
   - Time and date of complaint;
   - Details of complainant (including how complaint was made);
   - Details of complaint;
   - Name of person investigating on behalf of operator/licencee;
   - Details of weather conditions at time of complaint;
   - Details of site activity at time of complaint;
   - Interrogation of dust monitoring and meteorological data from on-site devices;
   - Details of any witness interviews;

b) Action & Resolution:
   - Comment as to complaint and cause;
   - Time and nature of immediate action taken;
   - Time and nature of follow-up action taken (if any);
   - Date and time complaint was resolved;
   - Recommended changes to operating procedures to prevent complaint recurrence;

Complainants will be advised of the complaint handling and resolution process, including receipt of a copy of the Complaint Report.

APPENDIX 1A

Location Plan including water source location and proposed water cart access routes.



APPENDIX 1B

Hydrologist's Report on Water Source Suitability.

STAGING PLAN (AREA 1)

for

TRICO RESOURCES PTY LTD

at

Lot 7 Toodyay Road, Bailup

17 August 2016

Prepared by:
TriCo Resources Pty Ltd
PO Box 1008 Osborne Park WA 6916

EXECUTIVE SUMMARY

This *Staging Plan (Area 1)* is prepared on behalf of TriCo Resources for the proposed development at Lot 7 Toodyay Road, Bailup ("the Site"). It forms part of the Department of Environmental Regulation (DER) Works Approval W5917/2015/1 for a Category 12 *prescribed premises.*

The proponents have sought and obtained Planning Approval and LGA Extractive Industry license from WAPC and the Shire of Mundaring respectively. Through the application process, a revised set of *Management Plans* were developed and approved to govern protection measures during proposed activity. This included a Dust Management Plan.

In consultation with DER, application was made for A Category 12 *prescribed premises* under Part V of the Environmental Protection Act. A works approval has been granted by DER (W5917/2015/1) and includes an improvement requirement IR3 that the Works Approval Holder submit additional information and plans on how the works will be stage. Information req5ruied on the plans are to include:

- expected monthly tonnages (product and overburden);
- topographical plans for each year of production, indicating location and extent of disturbed areas and stockpiles; and,
- any changes to mobile equipment not consistent with those forecast by the acoustic modelling.

This *Staging Plan* (Area 1) addresses the improvements required by DER. Prior to the commencement of works are Area 2, a Staging Plan (Area 2) shall be submitted by the Works Approval Holder to the CEO of DER.

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STAGING PLAN

**Note* This staging plan must be read in conjunction with the Dust Management Plan, Stormwater Management Plan, Noise Management Plan, Works Approval (#W5917/2015/1) and the Development Application.*

1 GENERAL

TriCo Resources ("the proponent") have sought a Works Approval from the Department of Environmental Protection ("DER") for a Category 12 Prescribed Premises *Screening etc. of material: premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated"* at Lot 7 Toodyay Road, Bailup ("The Site"). A Draft Works Approval has been issued by DER).

The site has already been granted WAPC planning approval and an LGA Extractive Industry license for the proposed works.

The site comprises of Lot 7, which is approximately 375.79 hectares of *rural* zoned land.

The majority of the site has been historically cleared and used for many decades for cropping and grazing. Some large clusters of natural vegetation, in the form of trees and shrubs, are found in various locations. Other isolated trees are located sporadically elsewhere.

The topography is generally gentle with relativity flat to moderate grades which elevate the land from approximately RL 265 AHD to RL 338 AHD. The land form rises in the south, west and east and is divided by Red Swamp Brook running southeast to northwest through the northern central portion of the property. The site is not considered at risk of flooding. Red Swamp Brook is recognised as a constrained area and this feature is therefore protected from the proposed development.

The site is boarded to the north by Toodyay Road for approximately 2.8 kilometres. Toodyay Road is the primary road access for the site. Lot 140, which borders most of the northern boundary is also owned by the same entity as Lot 7.

A dwelling is located central north in the valley where Red Swamp Brook runs north under Toodyay Road. The other neighbouring land holdings are large, undeveloped, rural landholdings to its west, east and south which have been predominantly cleared for rural use. Further north are semi-rural residential properties nested amongst dense native vegetation.

There are two dwellings which DER have deemed to be at risk from emissions. They are:
- 445 Squarcini Close (0.2 km West of the site) ["dwelling B"]; and,
- 3650 Toodyay Road (0.84km East of the site) ["dwelling G"].

Extractive Industry is proposed at 2 locations which total approximately 42 hectares in size. Processing of material (crushing and screening) shall occur in a depression midpoint

between the two extraction areas. Works shall be progressive to minimise the works footprint. Rehabilitation shall be progressive following completion of each stage.

2 EXCAVATION AREA & THROUGHPUT

Excavation of laterite rock from Area 1 shall occur in a staged manner to minimise the total area of disturbed surface at any one time. This will greatly assist in mitigating risk of dust lift off affecting sensitive receptors near the site.

Excavation areas are depicted at Appendix 1. Plans identify the expected progressive stages year by year.

Each stage of Area 1 represents an extraction area of between 2 and 3 hectares. Each stage has been forecast on expected annual sales of product. Staging is affected by market forces (supply and demand for product) therefore stages are subject to variation of faster or slower progress depending on the actual sales removing material from the site.

The staging plans found at Appendix 1 note the anticipated expected monthly tonnage of material to be handled (product and overburden) which varies up to 75,000 tonnes per month. Overburden and topsoil is only expected to be found in the top 500mm of the staged area. The balance of material will be laterite-based product.

3 STOCKPILING OF TOPSOIL AND OVERBURDEN

Prior to commencing excavation, topsoil and overburden unsuitable as product shall be removed from the surface of each stage area. This material shall be neatly stockpiled adjacent the stage area in the locations indicated on the staging plans found at Appendix 1.

Material unsuitable as product shall be used for rehabilitation (see Section 5 below).

4 PROCESSING AND STOCKPILING OF PRODUCT

Laterite rock excavated from the extraction areas shall be moved to the locations indicated within the area permitted for processing and stockpiling. Those areas are indicated on the staging plans found at Appendix 1.

Processing shall be limited to crushing and screening of laterite to meet specifications of customers. Material ready for sale shall be neatly stockpiled and managed for dust in the designated areas.

5 REHABILITATION

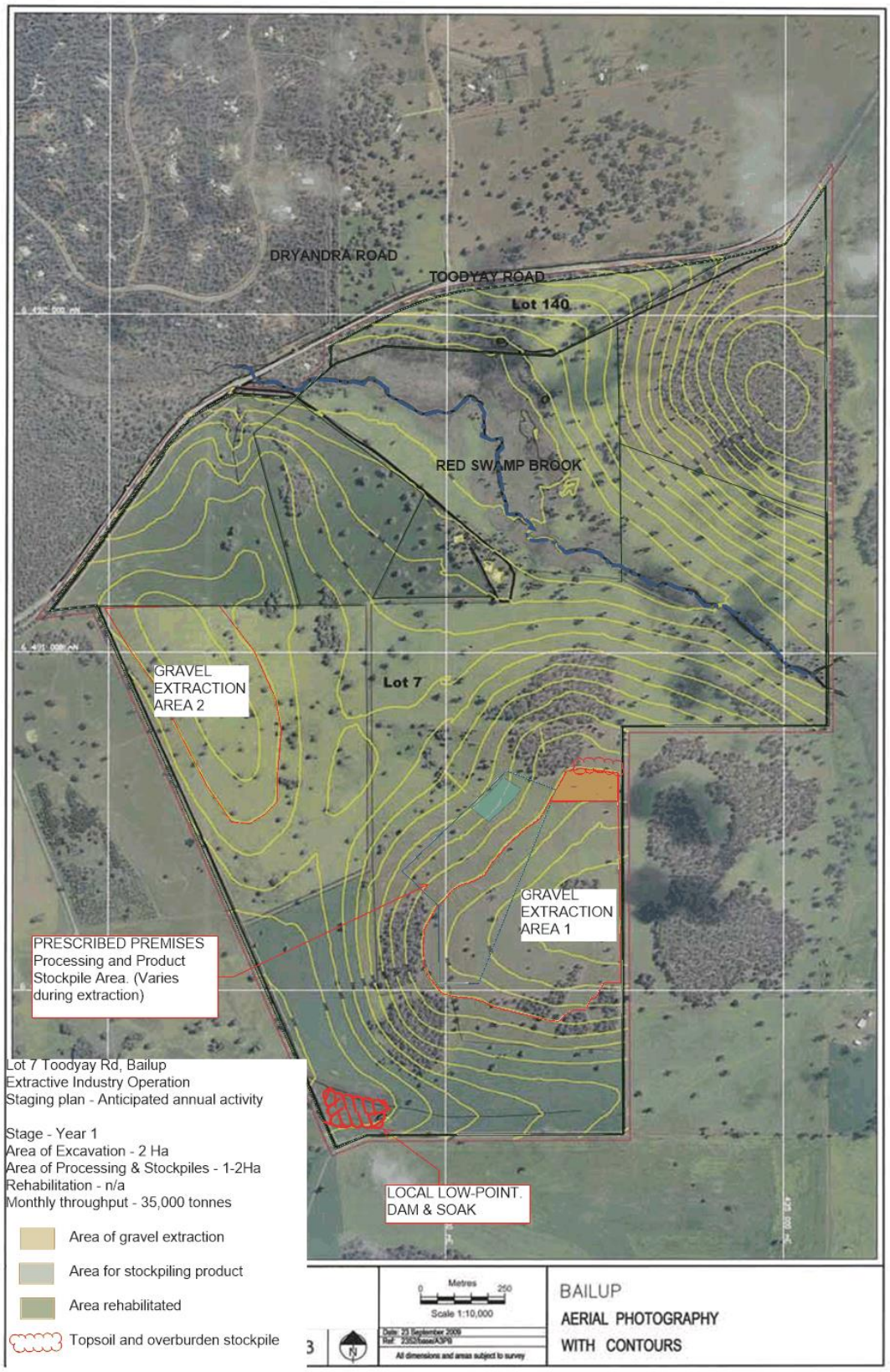
Rehabilitation shall commence as soon as practicable after the extraction of gravel has been completed for any staged area. Rehabilitation shall occur prior to the commencement of excavation of subsequent areas.

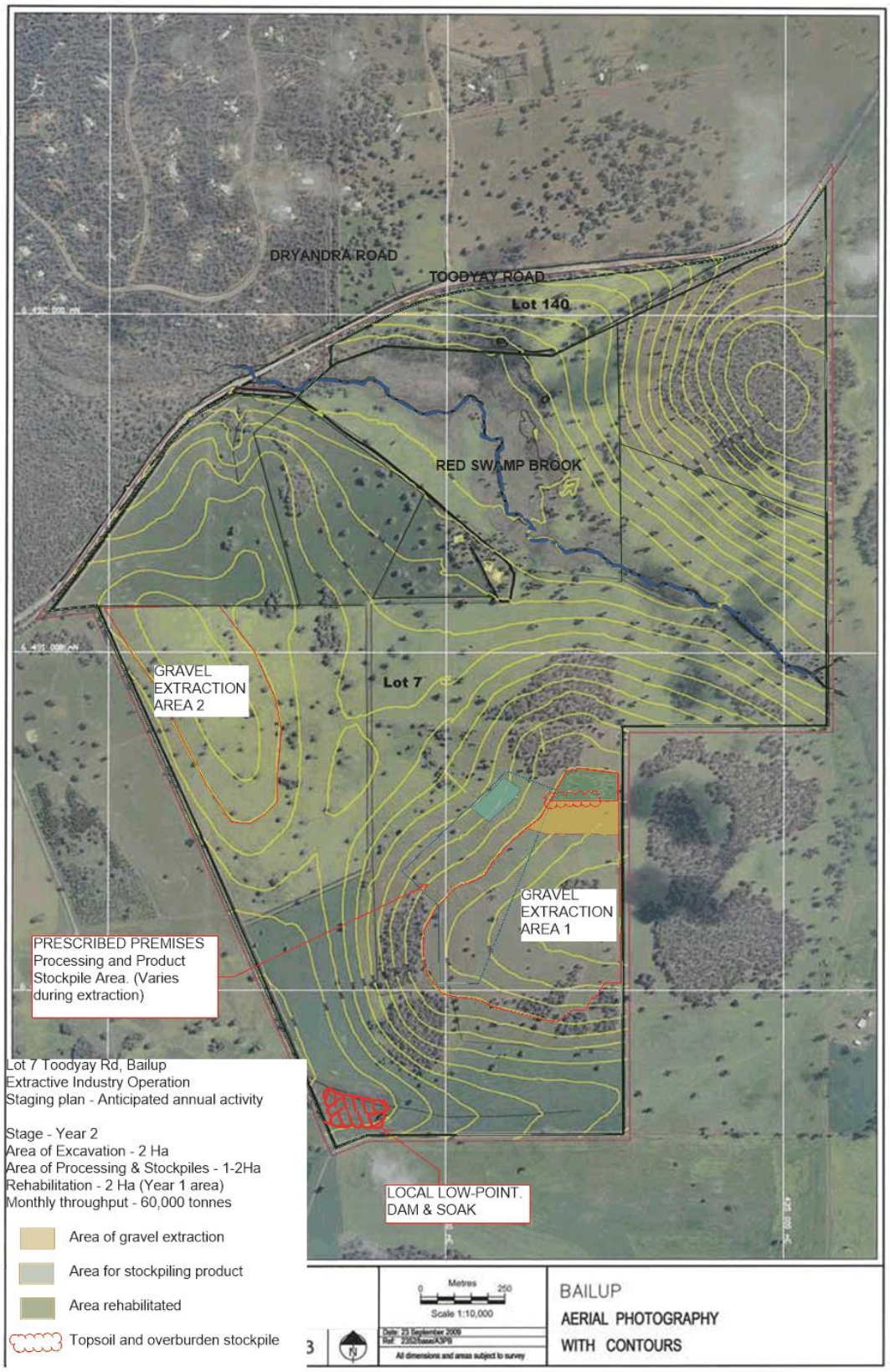
Rehabilitation shall be undertaken in accordance with the approved *Rehabilitation and Revegetation Management Plan* as included as part 4 of the document *Master Management Plan 10-Sep-*2010 as approved by WAPC and the Shire of Mundaring. Rehabilitation includes (but not limited to):

- Respreading of topsoil and overburden;
- Contouring land form;
- Seeding;
- Replanting of selective vegetation; and,
- Ongoing monitoring to ensure the success of revegetation.

APPENDIX 1

Staging plans (1 to 10) for Area 1


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 1
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - n/a
Monthly throughput - 35,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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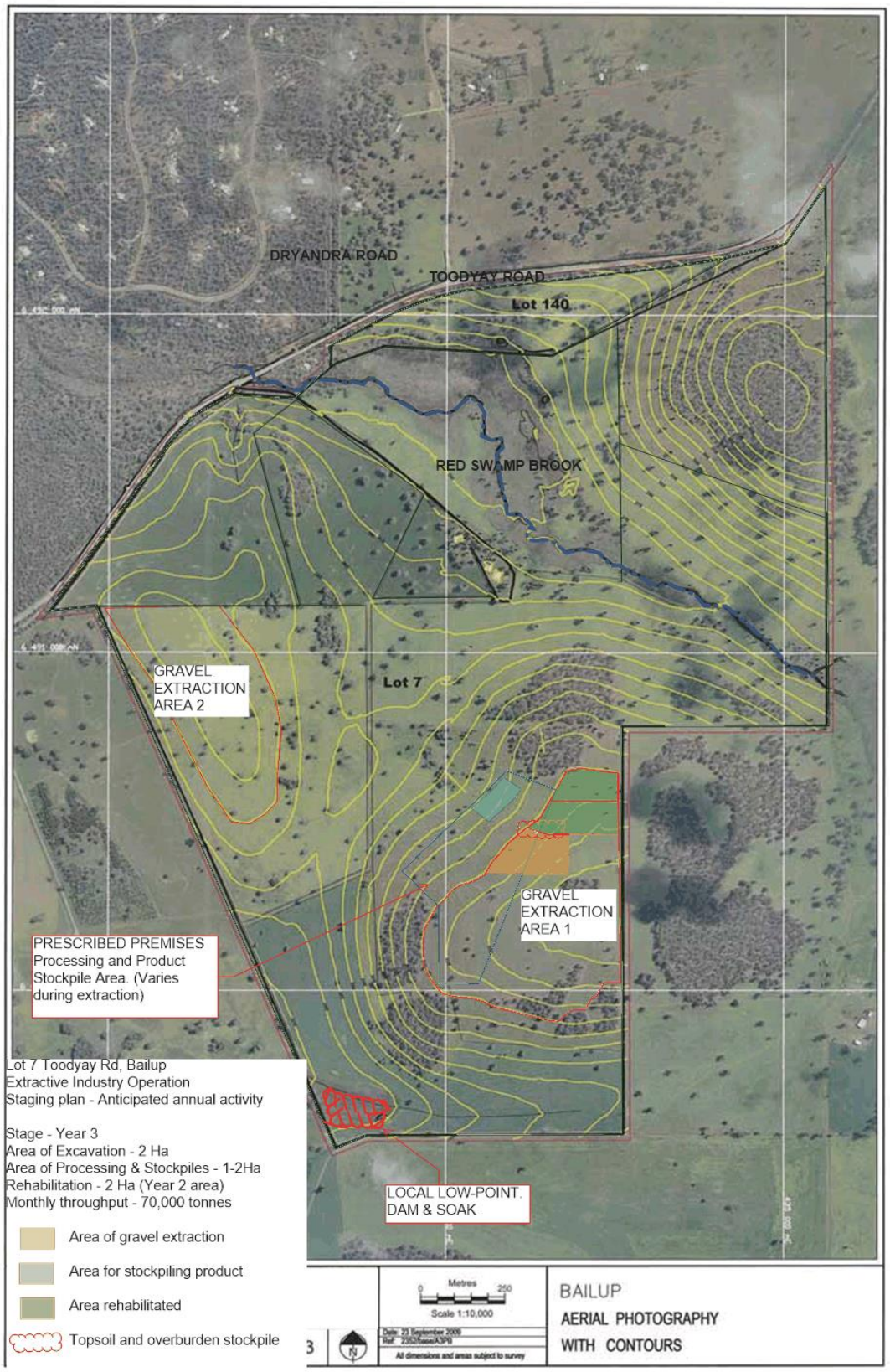
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 2
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 1 area)
Monthly throughput - 60,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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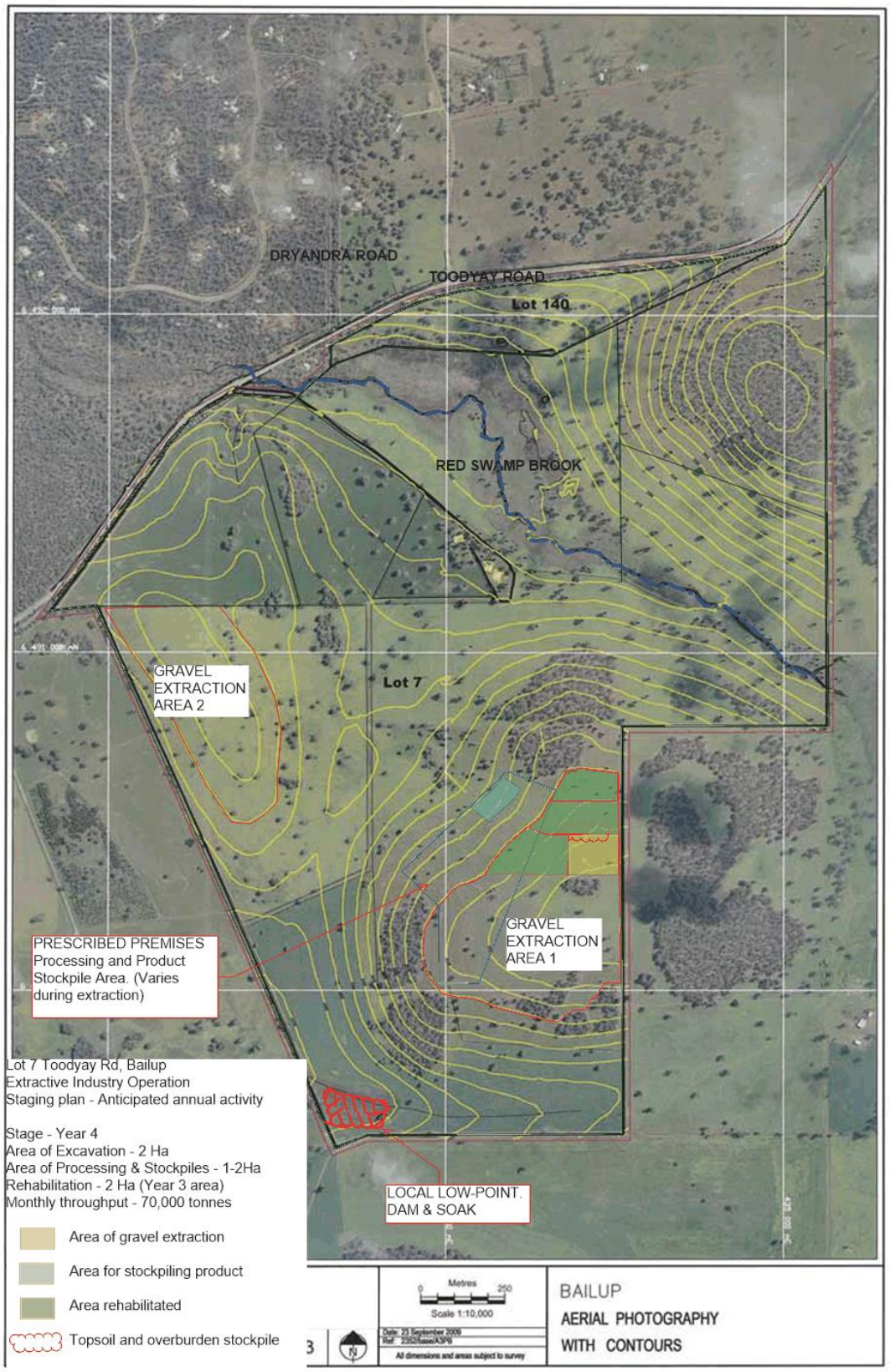
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 3
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 2 area)
Monthly throughput - 70,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 4
Area of Excavation - 2 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 3 area)
Monthly throughput - 70,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
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Scale 1:10,000
All dimensions and areas subject to survey
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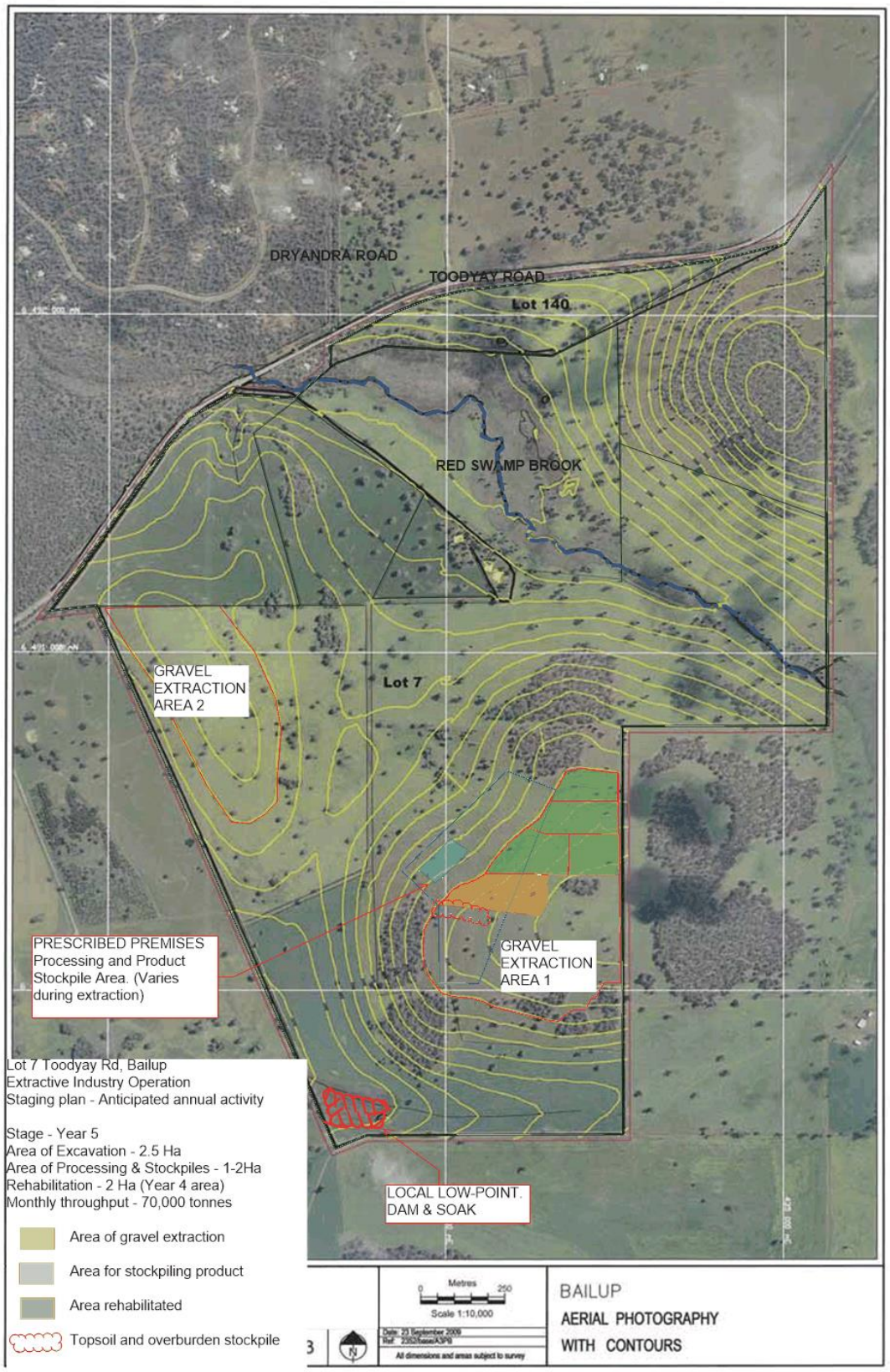
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TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
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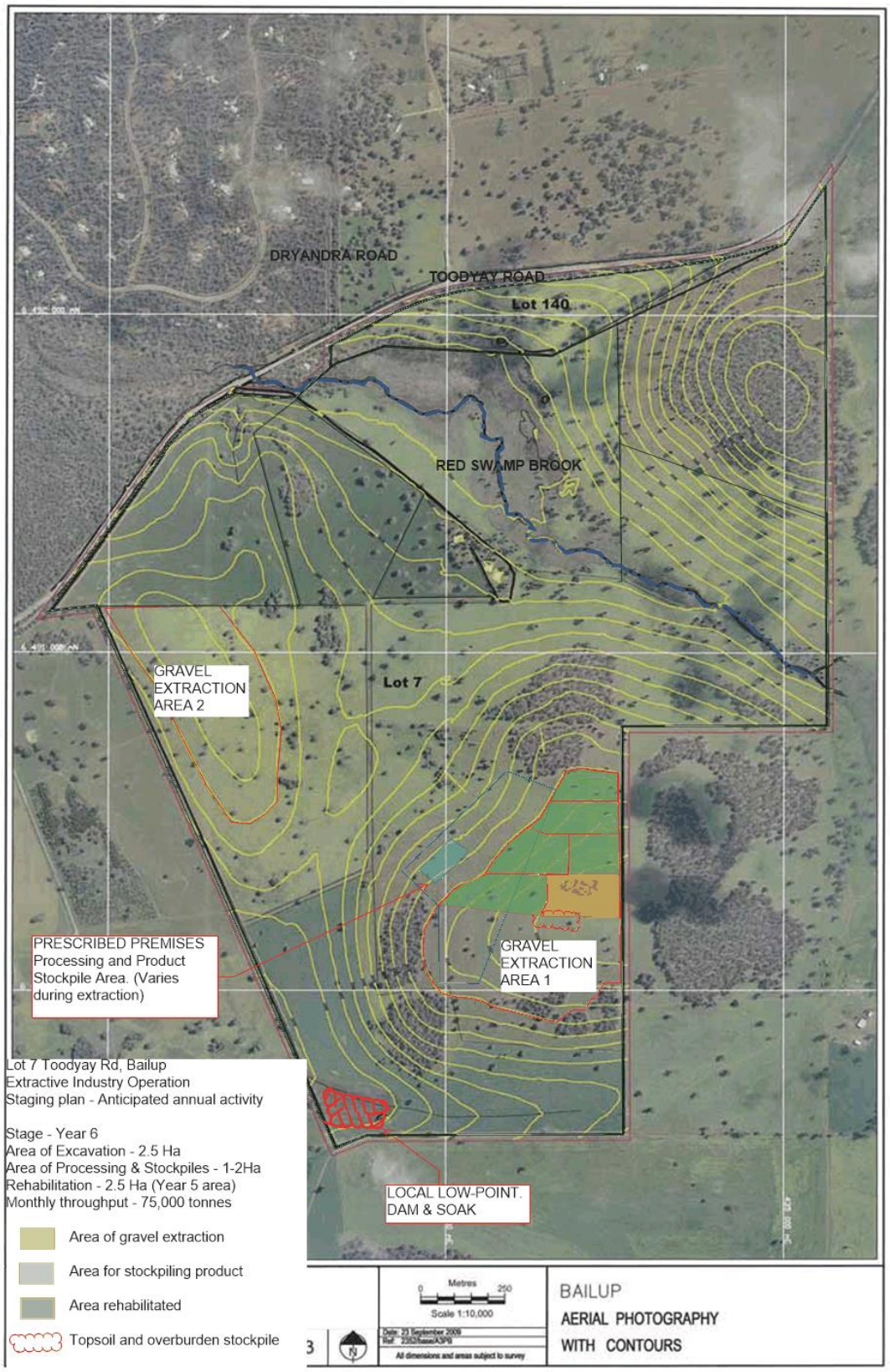
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 5
Area of Excavation - 2.5 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2 Ha (Year 4 area)
Monthly throughput - 70,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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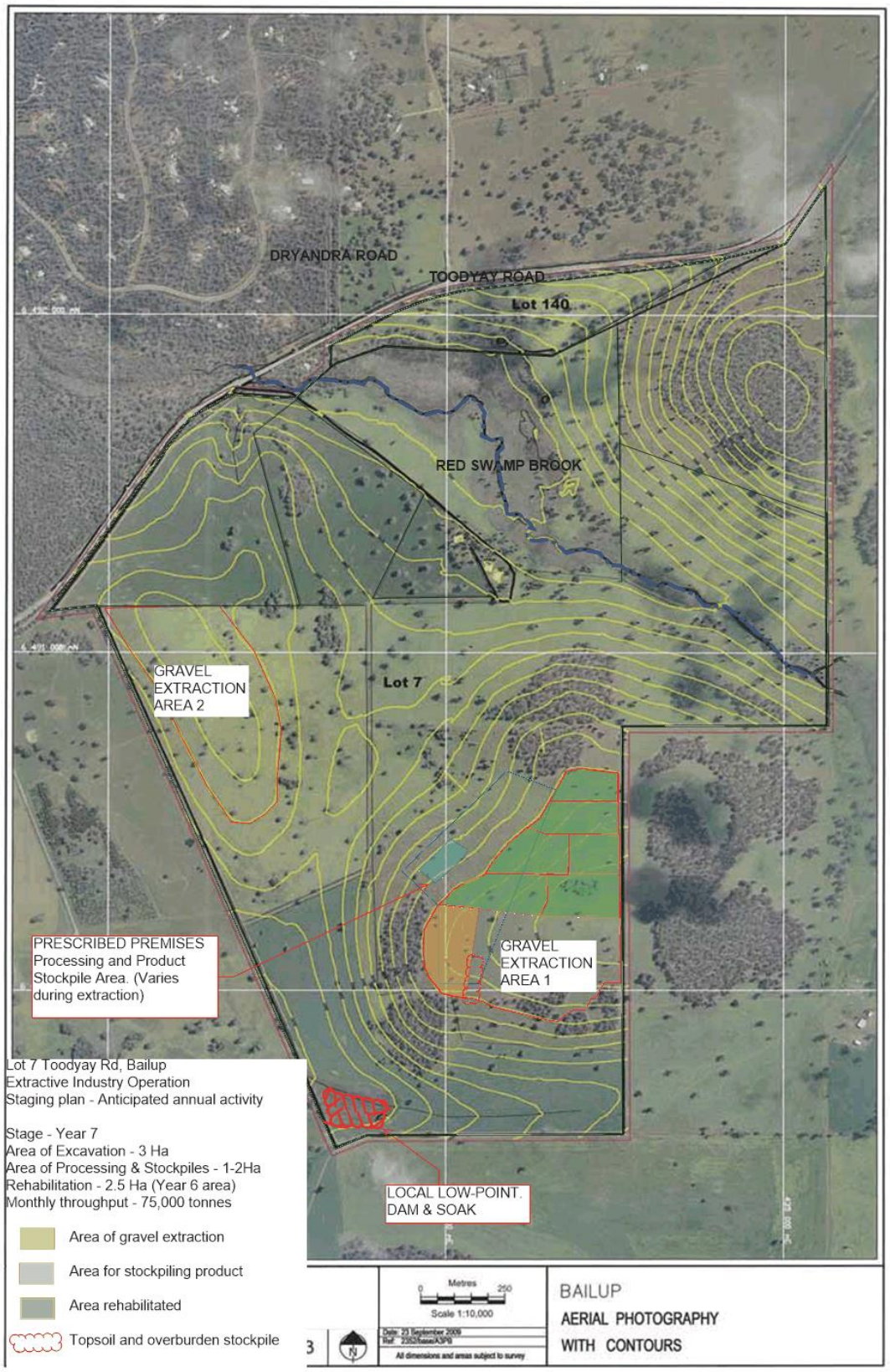
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 6
Area of Excavation - 2.5 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2.5 Ha (Year 5 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 7
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 2.5 Ha (Year 6 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
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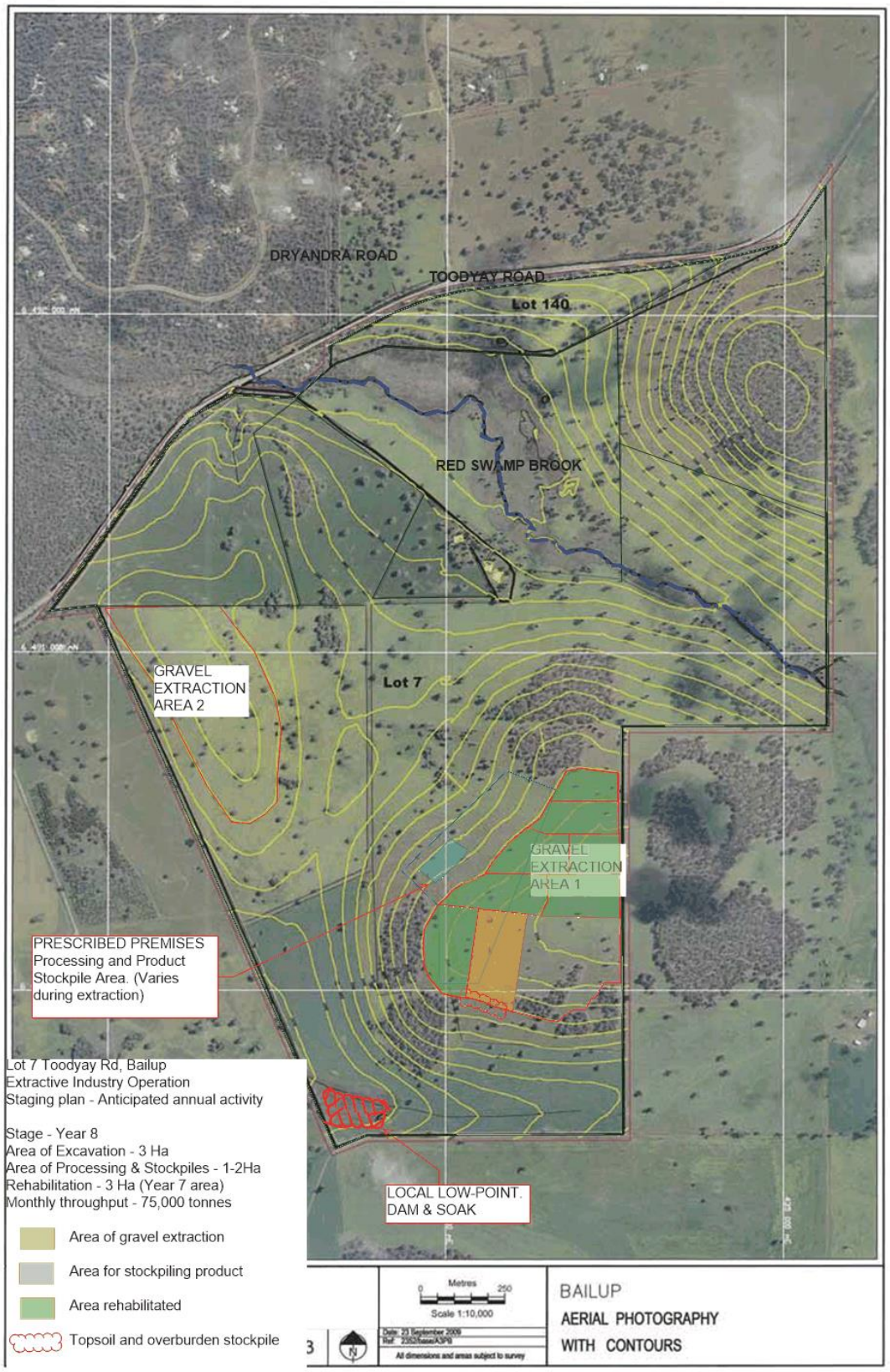
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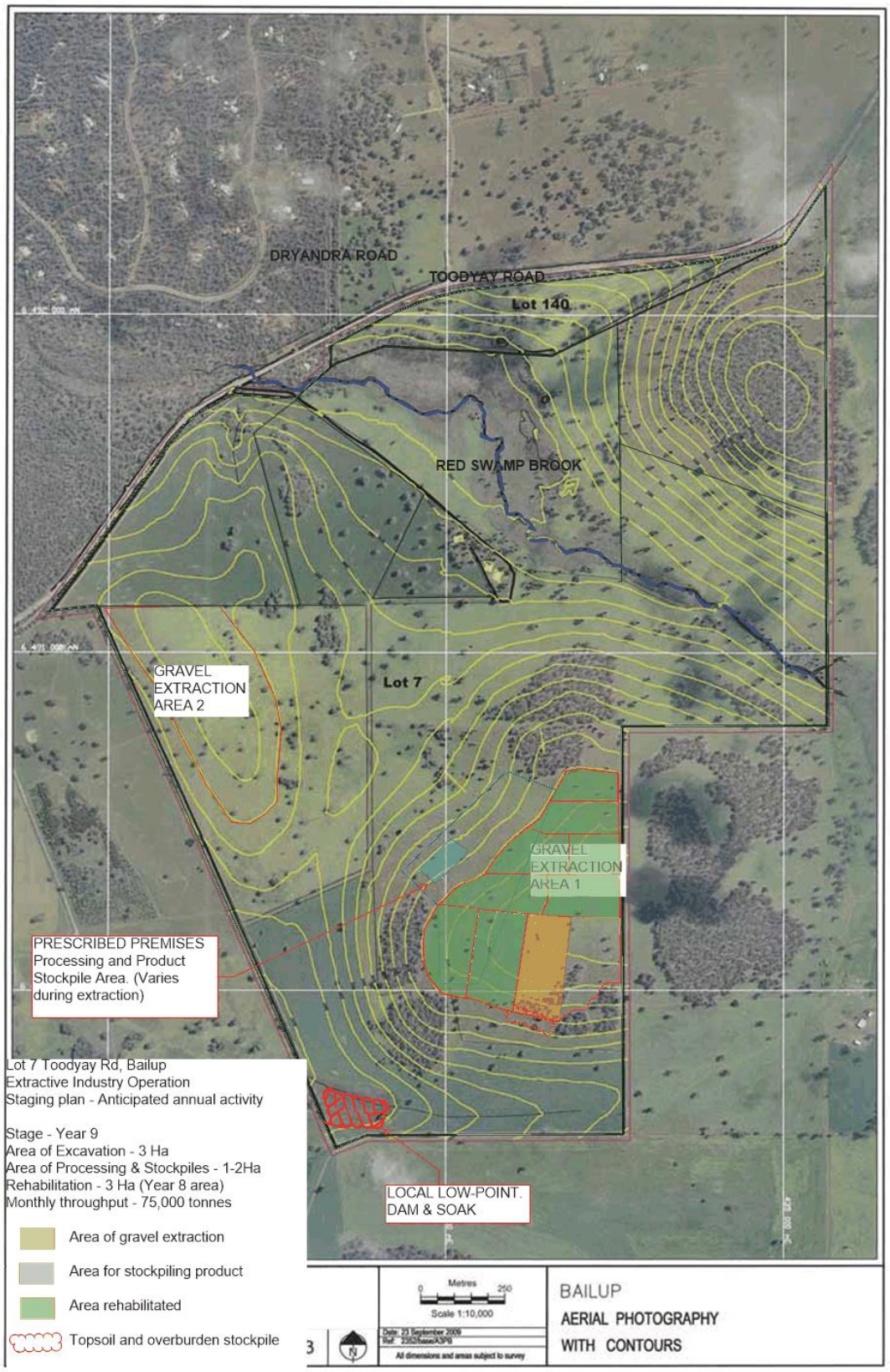
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 8
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 3 Ha (Year 7 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS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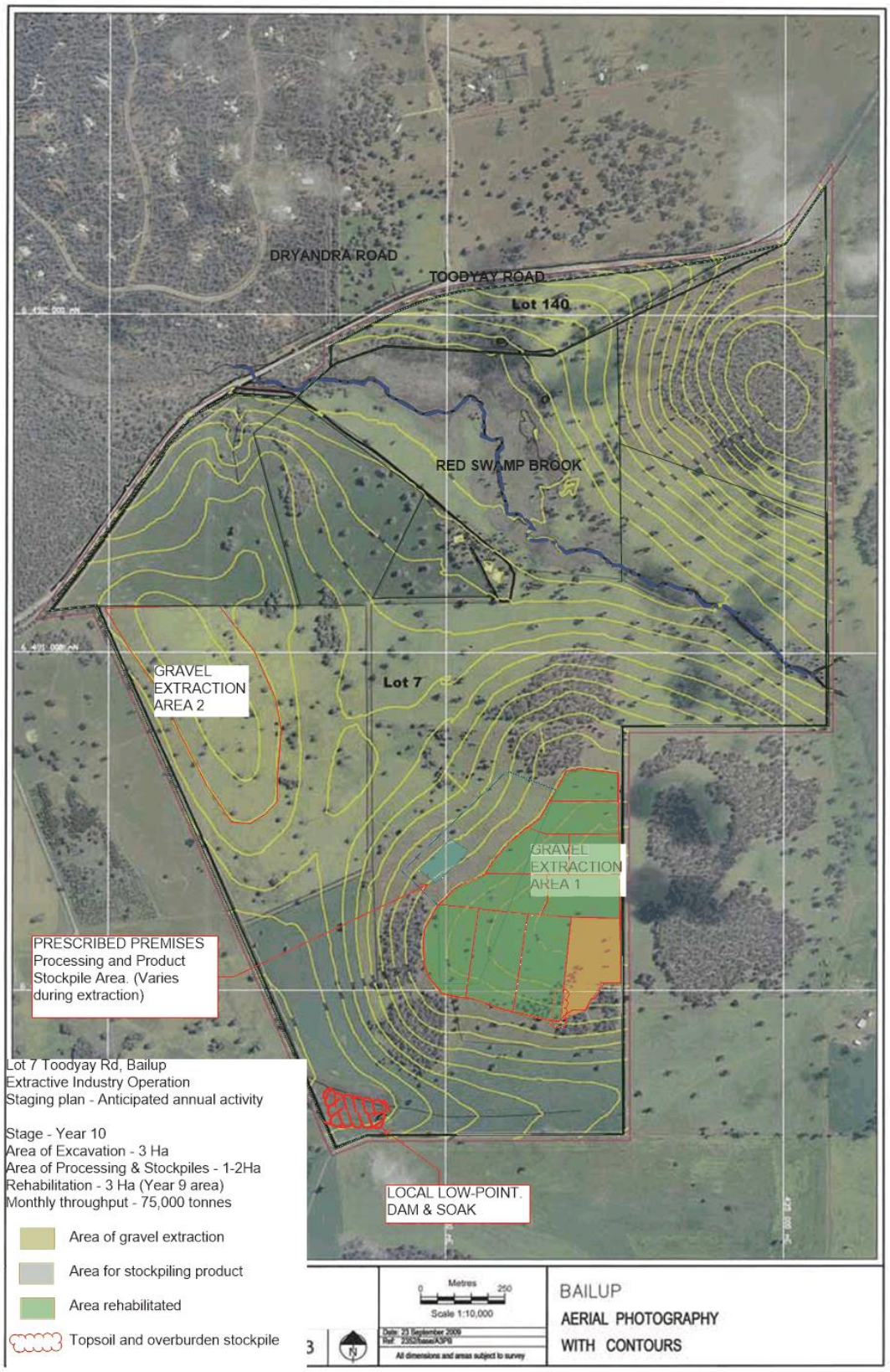
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
Lot 7
GRAVEL EXTRACTION AREA 2
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 9
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 3 Ha (Year 8 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS


DRYANDRA ROAD
TOODYAY ROAD
Lot 140
RED SWAMP BROOK
GRAVEL EXTRACTION AREA 2
Lot 7
GRAVEL EXTRACTION AREA 1
PRESCRIBED PREMISES Processing and Product Stockpile Area. (Varies during extraction)
LOCAL LOW-POINT. DAM & SOAK
Lot 7 Toodyay Rd, Bailup
Extractive Industry Operation
Staging plan - Anticipated annual activity
Stage - Year 10
Area of Excavation - 3 Ha
Area of Processing & Stockpiles - 1-2Ha
Rehabilitation - 3 Ha (Year 9 area)
Monthly throughput - 75,000 tonnes
Area of gravel extraction
Area for stockpiling product
Area rehabilitated
Topsoil and overburden stockpile
Metres
0
250
Scale 1:10,000
All dimensions and areas subject to survey
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS

STORMWATER MANAGEMENT PLAN

for

TRICO RESOURCES PTY LTD

at

Lot 7 Toodyay Road, Bailup

***Amended 10 August 2012**

Prepared by:
TriCo Resources Pty Ltd
PO Box 1008 Osborne Park WA 6916

EXECUTIVE SUMMARY

This *Stormwater Management Plan* is prepared on behalf of TriCo Resources for the proposed development at Lot 7 Toodyay Road, Bailup ("The Site"). It forms part of the Department of Environmental Regulation (DER) Works Approval W5917/2015/1 for a Category 12 *prescribed premises.*

The proponents have sought and obtained Planning Approval and LGA Extractive Industry license from WAPC and the Shire of Mundaring respectively. Through the application process, a revised set of *Management Plans* were developed and approved to govern protection measures during proposed activity. This included a Stormwater Management Plan.

In consultation with DER, application was made for A Category 12 *prescribed premises* under Part V of the Environmental Protection Act. A works approval has been granted by DER (W5917/2015/1) and includes an improvement requirement IR4 for the *Stormwater Management Plan dated 10 Sep-2014*. IR4 required that the Works Approval Holder submit a *revised* Stormwater Management Plan to include additional information on water storage and management infrastructure for contaminated stormwater as well as background monitoring of Red Swamp Brook. This *Stormwater Management Plan amended 10-Aug-2016* addresses the improvements required by DER.

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STORMWATER MANAGEMENT PLAN

1 BACKGROUND & SITE DESCRIPTION

TriCo Resources ("the proponent") have sought a Works Approval from the Department of Environmental Protection ("DER") for a Category 12 *Screening etc. of material: premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated*" prescribed premises at Lot 7 Toodyay Road, Bailup ("The Site"). A Draft Works Approval has been issued by DER (#W5917/2015/1).

The site has already been granted WAPC planning approval and an LGA Extractive Industry license for the proposed works.

The site comprises of Lot 7, which is approximately 375.79 hectares of *rural* zoned land.

The majority of the site has been historically cleared and used for many decades for cropping and grazing. Some large clusters of natural vegetation, in the form of trees and shrubs, are found in various locations. Other isolated trees are located sporadically elsewhere.

The topography is generally gentle with relativity flat to moderate grades which elevate the land from approximately RL 265 AHD to RL 338 AHD. The land form rises in the south, west and east and is divided by Red Swamp Brook running southeast to northwest through the northern central portion of the property. The site is not considered at risk of flooding. Red Swamp Brook is recognised as a constrained area with significant importance. This feature is therefore to be protected from the proposed development.

The site is boarded to the north by Toodyay Road for approximately 2.8 kilometres. Toodyay Road is the primary road access for the site. Lot 140, which borders most of the northern boundary is also owned by the same entity as Lot 7.

A dwelling is located central north in the valley where Red Swamp Brook runs north under Toodyay Road. The other neighbouring land holdings are large, rural landholdings to its west, east and south which have been predominantly cleared for rural use. Further north are semi-rural residential properties nested amongst dense native vegetation.

There are two dwellings which DER have deemed to be at risk from emissions. They are:
- 445 Squarcini Close (0.2 km West of the site); and,
- 3650 Toodyay Road (0.84km East of the site).

Extractive industry is proposed at 2 locations which total approximately 42 hectares in size. Processing of material (crushing and screening) shall occur in a depression midpoint between the two extraction areas. Works shall be progressive with up to 8 hectares under operation at any one time, and for rehabilitation to be progressive during the life of the project.

2 PURPOSE OF THIS MANAGEMENT PLAN

Proposed Extractive Industry activities are of an earthworks nature, which is recognised as a ground-disturbing operation.

The purpose of this Management Plan is to investigate the impact of stormwater overland flow onto and from the proposed activity. Potential impacts include nutrient concentration, erosion and overland flow of contaminated stormwater entering into sensitive water features. Red Swamp Brook is located approximately 500m north and 950m northeast of the proposed extractive industry areas and must be sufficiently protected through the implementation of this *Stormwater Management Plan.*

Draft Works Approval W5917/2015/1 sets out the requirements of the proponent, including stormwater management to be in accordance with *Stormwater Management Plan* dated 10-Sep-2010, which IR3 requires to be revised and issued to the CEO to including additional information on:

a) detailed schematics of the drainage and water storage infrastructure (trenches, cut-off drains, bunding and detention basins, existing dams etc.) such that contaminated stormwater does not enter Red Swamp Brook;
b) the diversion of clean stormwater away from operational stages;
c) proposed impact and background monitoring locations along Red Swamp Brook. Parameters to be measured shall include pH, electrical conductivity, total suspended solids and turbidity.

This *Stormwater Management Plan* dated 10-Aug-2016 addressed the additional information as required.

3 SITE STORMWATER CONDITIONS

3.1 PRE-DEVELOPMENT FACTORS

Topography

The Site topography varies from medium to low slope grades (up to 1:10) of which two of the western 'hilltops' are the proposed extraction locations.

Extraction Area 1 falls from northwest to west to south in a direction leading into depressed contours within The Site:

- North-northwest grades lead into approximately 10 hectares of moderately dense native vegetation (trees and bushes). Red Swamp Brook is approximately 700 meters north of this area. There are no landforms or drains that collect or concentrate water from this area to Red Swamp Brook.

- Northeast grades lead through cleared grazing slopes to a depression between Area 1 and Area 2. This depression is not a creek or waterway and spreads across 50 hectares of land used for cropping and grazing.
- West grades lead through to another 13 hectares of moderately dense native vegetation.
- South grades flow through a band of 3-4 hectares of vegetation before moving south over 20 hectares of The Site's cropping farmland. Further south is a land depression leading to a soak/dam in the southwest corner where water will be extracted for dust control purposes.

Extraction Area 2 falls in all directions, being atop of a narrow hill:

- East grades flow over 50 hectares of cropping land.
- South grades flow south and east into The Site towards the existing southwest corner dam and the large open depression between the two extraction areas.
- West grades flow over grazing land to the west boundary. Neighbouring land is also farmland.

Refer to the Stormwater Overland Flow Diagram found at Appendix 2A which illustrates the above.

Dams and Soaks

There is a natural depression in the southwest corner of the Site. It is located approximately 1.7km from Red Swamp Brook. Topography from the south and west part of the site grade to the soak where water infiltrates into the ground or is detained at the depression.

Creeks and Drains

There are no existing forced stormwater catchment structures, either natural or artificial, other than the central gravel track which generally follows a depression located between the two gravel extraction areas. Should proposed activities not create concentrations of stormwater (unless detained), stormwater overland flow does not adversely affect the existing surface with scouring.

Topsoil

Proposed extraction areas are either devoid of topsoil (where rock is exposed at the surface) or have a thin layer of topsoil (50mm to 100mm thick). Topsoil shall be salvaged and replaced as part of the staged rehabilitation of the extractive works. Rehabilitation is discussed in further detail below.

The topography and dense soil nature means that local infiltration of stormwater is retarded. This is evidenced by the nature of existing vegetation being predominantly large trees. Therefore, heavy rain events will quickly surpass ground infiltration and move overland in the directions detailed above. Despite this, there is no evidence of water concentration, scoured drains or other similar impacts.

Infiltrated water flow will move generally in the same direction with underlying clay soils being less permeable and forcing water to move along the direction of the contours. Movement of water below the surface is not affected by the proposed extraction activities as they are proposed well above levels of water found at the southwest dam and Red Swamp Brook.

Vegetation

Vegetation has historically been cleared and The Site used for cropping and grazing. Some selective clumps of native vegetation remain and surround extraction Area 1. Stormwater is allowed to move without restriction along contours until sufficiently infiltrated.

3.2 POST-DEVELOPMENT IMPACT

Proposed extractive industry will not vary the general direction of overland flow as described above. Contours will still fall in the same direction post development. Extractive industry shall occur at the top of two elevations and lower the cap of those 'peaks' by approximately 8-12 metres.

Water for the purposes of dust control shall be taken from the soak/dam in the southwest corner for more details on this, refer to the *Dust Management Plan* for this development.

The following events occurring during extractive industry may affect stormwater flow:

- Infiltration rates will be reduced in areas where topsoil is removed (albeit minimal) until rehabilitation is undertaken;
- Clearing will reduce natural consumption of infiltrated water, although rehabilitation increase in vegetation shall consume more;
- Earthmoving may cause concentrations of water flow at depression, that may cause causing scouring downstream; and,
- Water flow off areas being mined will contain elevated levels of sediments.

The following events occurring after completion of extractive industry may affect stormwater flow:

- Changes to ground levels altering catchment and flow direction;
- Loose soil replaced over the surface being subject to erosion; and,
- Removal of mature trees (few) and addition of mass revegetation seedlings (many) will alter soil stabilisation and natural water take-up.

Section 4 prescribes the management roles and control measures to be implemented to overcome any of the above factors.

It is anticipated that the pre and post development flow and water movement will be similar. That includes: direction of flow, infiltration rates and outcome. The primary change in water shall be from the increase in vegetation as a result of implementing the revegetation plan; to the satisfaction of the local authority environmental officer requirements for post-development rehabilitation.

4 STORMWATER MANAGEMENT

4.1 GENERAL

Mitigating the negative effects of stormwater in bulk-earthworks type of activity is largely a product of site surface management. This includes:

- Care with regards to removing and replacing topsoil;
- Shaping site levels to avoid water ponding;
- Controlling water runoff and concentration; and
- Attenuating water to allow for nutrient and sediment stripping.

The proposed extractive industry seeks to earthwork specific areas of The Site in a staged manner. That being, smaller segments of gravel extraction shall occur at any one time. There are many social, economic and environmental reasons for this (as discussed in the proponent's extractive industry application). Staged works areas also affect the Stormwater Management planning and control.

The principles, directions and recommendations for stormwater management apply to each stage, although exact site directions will vary and are part of day-to-day site management responsibility.

Of key importance is for the prevention of stormwater which flows from/over the works area (defined as "contaminated stormwater") does not enter Red Swamp Brook. Where natural overland contour flow falls away from the works area towards Red Swamp Brook, drainage infrastructure is to be constructed to prevent water entering into Red Swamp Brook.

4.2 DIVERTING WATER FROM RED SWAMP BROOK WITH CUT OFF DRAINS

Cut off drains constructed in strategic locations at the perimeter of Areas 1 and 2 can intercept contaminated stormwater which may flow off the works area to direct that water away from Red Swamp Brook. When directed towards the southwest corner of the site (where there is a local low-point and natural soak, contaminated stormwater is relocated to a distance of 1.7km away from Red Swamp Brook. The low point allows for the attenuation of stormwater should it be carrying sediment or contaminants. Water for dust control shall be extracted from the soak at the low point (refer to the site *Dust Management Plan*).

The contour plan found at Appendix 2A identifies the direction of natural overland flow at and around the works areas. Area 1 grades towards the north, west and south. Area 2 grades to the east, west and south. To capture any contaminated stormwater overland flow, cut off drains (as depicted on the plans) are to be constructed along at the north and northwest perimeter of Area 1 and to the east and west of Area 2.

Cut off drains are to be constructed at to the commencement of earthworks. Cut off drains are to be shaped by the use of local soil to form a bund parallel to land contours and having a shallow grade in the directions indicated on the stormwater plan.

Clean stormwater is to be diverted from entering excavation areas. However at this site, the excavation areas are located over the top of two hills. Therefore there is no "clean stormwater" flowing overland and onto the works area.

4.3 WATER ATTENUATION AND SCOUR PROTECTION

Stormwater events which surpass infiltration create overland flow. Overland water flow can create environmental issues where water is concentrated (or, channelled) and allowed to build up volume and speed. Concentrated water flow can lead to scouring and cause erosion, while also carrying sediments farther from their source.

Water attenuation principles are used to temporarily catch and control contaminated stormwater which may become concentrated as it flows off the works area. After attenuation, water movement is controlled through dispersing, increasing infiltration and retarding flow - all of which help to alleviate the above-mentioned effects.

Extractive industry will vary the Site as soil and rock is excavated from the surface to varying depths. Even slight changes to the surface can create grades that channel stormwater. Although the general direction will not vary from pre-existing, water channelling is a marked change which can easily occur. Water ponding also leads to channelling where overflow creates an artificial 'weir'.

Where contaminated stormwater is allowed to flow off the works area and forms (or is expected to form) a channel, the following water movement control measures shall be implemented:

a) Localised earthworks to dam and direct water moving off the works area to a sediment trap using cut off drains; and

b) Hay-bale (or other similar) screen interface between channels and dispersed overland flow - termed a 'hay bale sediment trap'.

Cut off drains shall be used to direct stormwater where sediment or scouring within the extraction area is considerable and concentrated, thereby needing control to deflect water to a sediment trap.

The hay bale sediment trap temporarily attenuates contaminated stormwater by acting as a seeping dam. It will:

(1) Capture and screen out sediment by attenuating water to permit sediment to settle; and,

(2) Release stormwater in a slow and controlled manner after seeping through the permeable hay bales. Downstream of which, natural landforms and contours disperse stormwater as occurring pre-development.

Refer to diagrammatic illustration of the hay bale sediment trap found at Appendix 2B. The use of rip-rap (unmortared stone-pitching) and screening fabrics can also be used in lieu of hay bales as an alternative to achieve the same management of contaminated stormwater.

As necessary, and where required, either along the perimeter of the works area, or further down hill, additional hay bale sediment traps shall be constructed to encourage ground infiltration and discourage scouring. Hay bales eventually break-down after a few years and once rehabilitation has stabilised the works are, are no longer necessary.

Non-channelled water and clean stormwater, similar to pre-existing overland flow events, shall not be attenuated. Natural infiltration and sediment capture shall sufficiently disperse either over the cleared farmland or clumps of remnant vegetation while still contained within the Site.

The planning and use of hay bale sediment traps are an on-site day-to-day direction undertaken by the Site supervisor who is to be provided a copy of this *Stormwater Management Plan*. Sediment traps may also be used during rehabilitation should areas be identified where scouring may occur.

4.4 SURFACE STABILISATION

Stabilisation of the surface is undertaken as part of the *Dust Management Plan* and primarily involves the application of water drawn from a soak and sprayed over the affected area. However, stabilisation is also necessary for protection of rehabilitated surfaces

Salvaged topsoil is respread over areas of extraction after completion of staged works. Loose topsoil contains endemic seeds which germinate to stabilise the topsoil within weeks and months (depending on the season). However, significant rainfall can cause abnormal scouring of loose soil, preventing effective rehabilitation and carrying topsoil downhill.

To mitigate the potential for topsoil scouring the following actions shall be undertaken during rehabilitation:

(1) Topsoil shall be lightly compacted with a roller or other suitable heavy equipment;

(2) Rehabilitation shall occur during seasonal periods where germination is anticipated (winter-spring);

(3) Rehabilitation shall include germination of seeds contained naturally in salvaged topsoil, plus the application of seeds by hydromulching or dry seeding if necessary to form a thicker grass and root mass; and,

(4) The *Revegetation Management Plan* shall include the following criteria:

- Planting to occur winter through mid spring to improve percentage of new plant establishment;

- Planting to be native endemic species of a random and mixed variety. All species of vegetation shall be presented to Shire of Mundaring Environmental Officer for acceptance and compliance with current species list for the area where the Site resides;
- Planting to be in clumps of mixed species to represent pre-clearing and adjacent uncleared vegetation areas;
- Planting to be concentrated on the perimeter of works area to promote reintroduction of native fauna as well as the rehabilitation and stabilisation of batters formed by earthworks;
- Planting to be secondarily concentrated in clumps within the rehabilitation areas to avoid excessively large open and bare areas, or sparse, formal type revegetation layouts;
- Guidelines for planting tree farms adopt a 'valley to valley' approach rather than 'ridge to ridge'. Therefore, planting at the perimeter of the rehabilitation shall be in a 'valley-to-valley' method; and,
- Staging of extraction and rehabilitation will permit revegetation of completed areas as soon as practical to promote early regrowth while subsequent states are under operation.

The re-introduction of endemic vegetation to areas historically cleared for agricultural uses, will, by its nature, consume more water – particularly in the long term. The increase in vegetation complies with the regulatory authorities goal for rehabilitation of extractive industry sites, however that increase in vegetation at higher contours, shall consume stormwater previously destined to travel overland and underground to Red Swamp Brook and the soak in the southwest corner of The Site. Nonetheless, it is expected that the pre-farm clearing densities of vegetation is a preferable outcome achieved by the rehabilitation of the site.

4.5 REHABILITATION CONTOURING

Rehabilitation of completed stages of extractive industry shall include the contouring of affected area to maintain general directional fall and eliminate areas where water can pond or concentrate. Earth working machines employed on site for extractive industry can be used to form gentle slopes and remove abrupt deviations in the surface before replacement of topsoil.

In preparing subsequent stages of extractive industry, soil not suitable for extraction (termed 'overburden') can be transplanted to areas being rehabilitated and needing localised filing and shaping to achieve this outcome.

4.6 MONITORING

Ongoing monitoring of the Site is paramount to ensuring both the success of rehabilitation and controlling water movement on current and completed stages. Rehabilitation is directly related to the success in controlling stormwater overland flow and preventing scouring.

Therefore, on site management shall:

(1) Undertake regular inspections of the extractive industry works area to identify potential points of water concentration and scouring; and implement measures as necessary; and

(2) Undertake seasonal inspection of rehabilitated areas to determine the success of surface stabilisation and if further water control measures need to be implemented. These inspections apply during and immediately after significant rainfall events.

5 MONITORING OF RED SWAMP BROOK

5.1 BACKGROUND

Red Swamp Brook is an environmentally sensitive feature. Water travels diagonally through the middle of the Site from the southeast to the northwest. After heading north under Toodyay Road and is used by landowners for domestic purposes.

Red Swamp Brook is not to be interfered with or adversly affected by the proposed development activity. This includes:

- Water for dust control shall not be drawn from Red Swamp Brook;
- Works area and vehicle movement shall not enter Red Swamp Brook; and,
- Contaminated stormwater shall be prevented from entering Red Swamp Brook.

5.2 AUTHORITY REQUIREMENTS

Department of Indigenous Affairs has acknowledged the proponents application and advised that Red Swamp Brook (a 20 metre wide strip of land containing the waterway) is a Swan River tributary and therefore a Registrar entry that requires any development over this area to seek approval from DIA.

Department of Water has acknowledged the proponents application and has not required any conditions relating to taking of water or protection measures.

Department of Environmental Regulation have guidelines and policies governing water bodies and contamination prevention requirements. DER Draft Works Approval W5917/2015/1 IR4 specifies the protection of Red Swamp Brook from contaminated stormwater, and for the monitoring of water quality.

Shire of Mundaring Environmental Department has acknowledged that water shall not be taken by the proponent for use in the extractive industry to satisfy concerns of landowners downstream who take water from Red Swamp Brook.

5.3 IMPACT ON RED SWAMP BROOK

Land contours at the site show that at Extraction Area 1, overland flow is north-east and south. Red Swamp Brook is located 650 metres north of Area 1. Cut-off drains located on the north and northwest perimeter of Area 1 shall intercept and divert contaminated stormwater away from the direction of Red Swamp Brook [see Appendix 2A].

Land contours at the site show that at Extraction Area 2, overland flow is north-south east and west. Red Swamp Brook is located 950 metres northeast of Area 2 Cut-off drains located on the west and east perimeter of Area 2 shall intercept and divert contaminated stormwater away from the direction of Red Swamp Brook [see Appendix 2A].

The works area, including access tracks within the site, do not interfere or cross over Red Swamp Brook.

Consumption of water for the works (specifically for dust control) has been investigated in the *Dust Management Plan*. An adequate source has been identified at the local dam/soak located at the southwest corner of the Site approximately 1.7km away from Red Swamp Brook. Hydrological investigation has determined that suitable quantity is available and impact in taking that water is negligible.

The nature of the proposed works is extraction and non-chemical processing of in-situ soil and rock. No materials, chemicals, processors or other such activity is anticipated to impact on water quality for any aquifer or water feature on or near the Site.

5.4 WATER QUALITY TESTING

As specifically requested by Shire of Mundaring and DER, water quality of Red Swamp Brook is to be routinely tested by the proponents to identify possible impact from the proposed extractive industry. Water testing results shall be provided to Shire of Mundaring Environmental Department.

5.4.1 Testing Regime

Testing regime shall be formed from the following:

- A 'control' sample taken prior to commencing ground disturbing activities;
- Tests undertaken annually (during July when water is sufficiently flowing); and
- Two samples taken from Red Swamp Brook for quality comparison of water entering and leaving The Site. [Refer site plan found at Appendix 2C and 2D].

5.4.2 Qualitative Criteria

Water quality shall be determined by the following parameters:

- Acidity (pH);

- Electrical Conductivity (EC);
- Total suspended solids;
- Turbidity;
- Nutrients (Ammonia and Nitrate levels, Total Phosphorous, Total nitrogen);
- Suite of Metals (Aluminium, Iron, Copper, Cadmium, Chromium, Nickel and Lead);

5.4.3 Comparative Analysis and Triggering Events:

An analysis of water tests results shall be made as follows:

- Comparison between water sample entering and leaving site;
- Comparison with control sample;
- Comparison with historical records; and,
- Comparison to ANZECC & ARMCANZ guidelines (2000) for fresh water in slightly to moderately disturbed ecosystems.

Rainfall over surface catchments and concentrations into water bodies such as creeks can markedly impact the validity of water analysis and comparison. The inflow of stormwater can significantly increase freshness and reduce concentrations of contaminants. Therefore two criteria shall be adopted for triggering an event where water analysis shall be considered significant enough to requiring further investigation and/or action:

(a) A change of 25% in qualitative criteria (as recommended by *Department of Agriculture* as a triggering event).

(b) Contamination levels above ANZECC & ARMCANZ guidelines (2000) for fresh water in slightly to moderately disturbed ecosystems

5.4.4 Contamination Action Plan

Should water quality tests identify a triggering event, the proponents shall engage a suitably qualified water consultant to investigate the Site and all potential impacts on Red Swamp Brook so that a contamination investigation and action plan can be implemented.

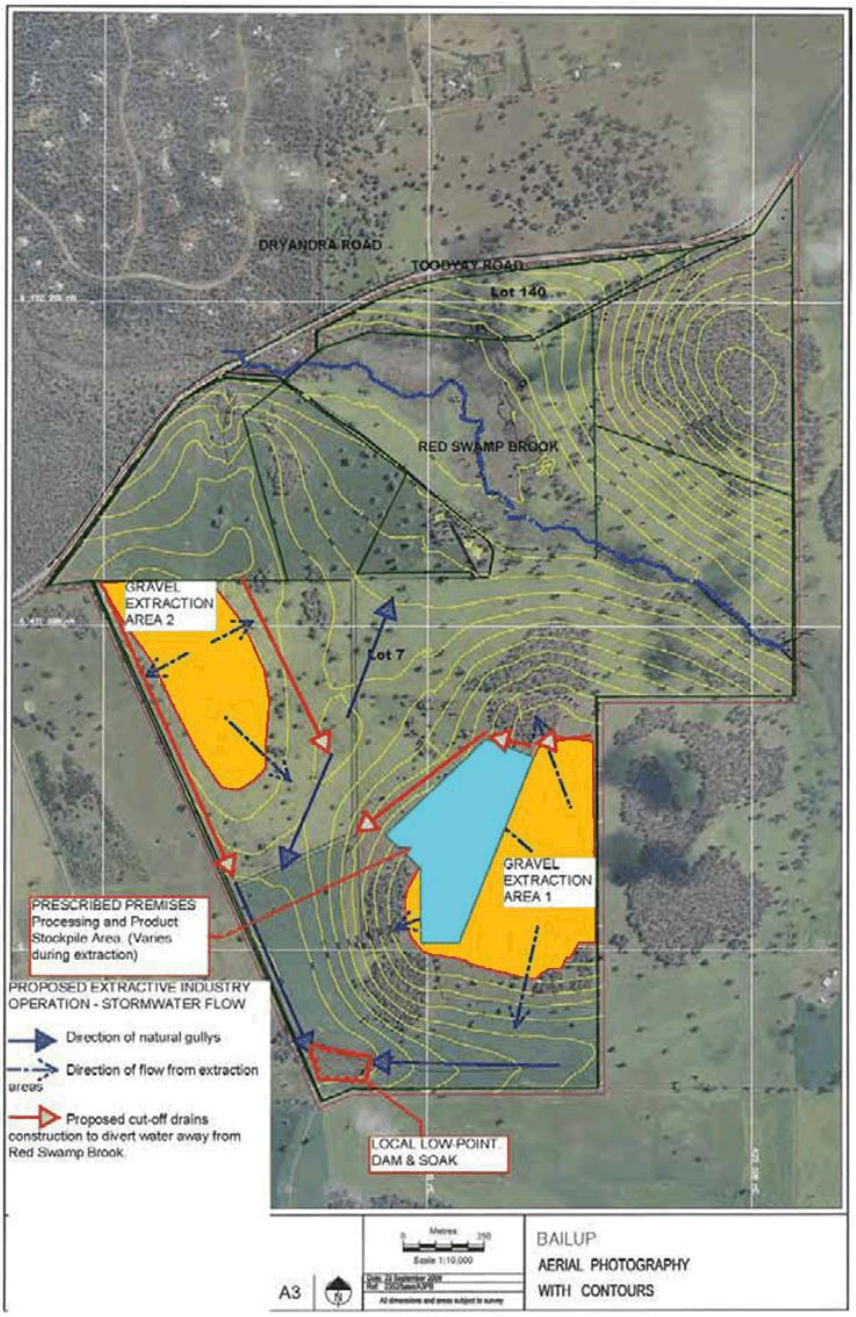
The consultant shall be required to advise the proponents, and the proponent shall undertake thereof appropriate action. That shall include where applicable:

- immediate measures to contain any contamination;
- immediate measure to prevent further contamination;
- remediation measures;
- ongoing changes or action to site activity to prevent re-occurrence;
- monthly investigation to ensure contamination causes by extractive industry have been eradicated;

A Water Quality Testing and Action Plan schedule can be found at Appendix 2D.

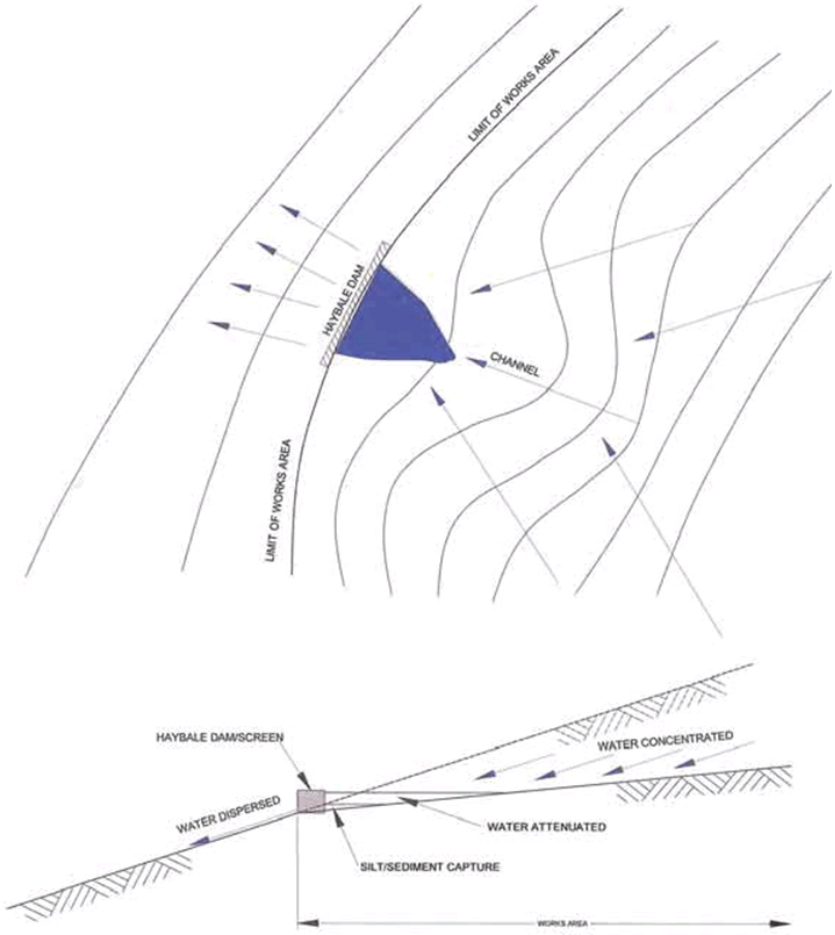
APPENDIX 2A

Stormwater Overland Flow Diagram & Cut off Drain locations



APPENDIX 2B

Hay Bale Sediment Trap



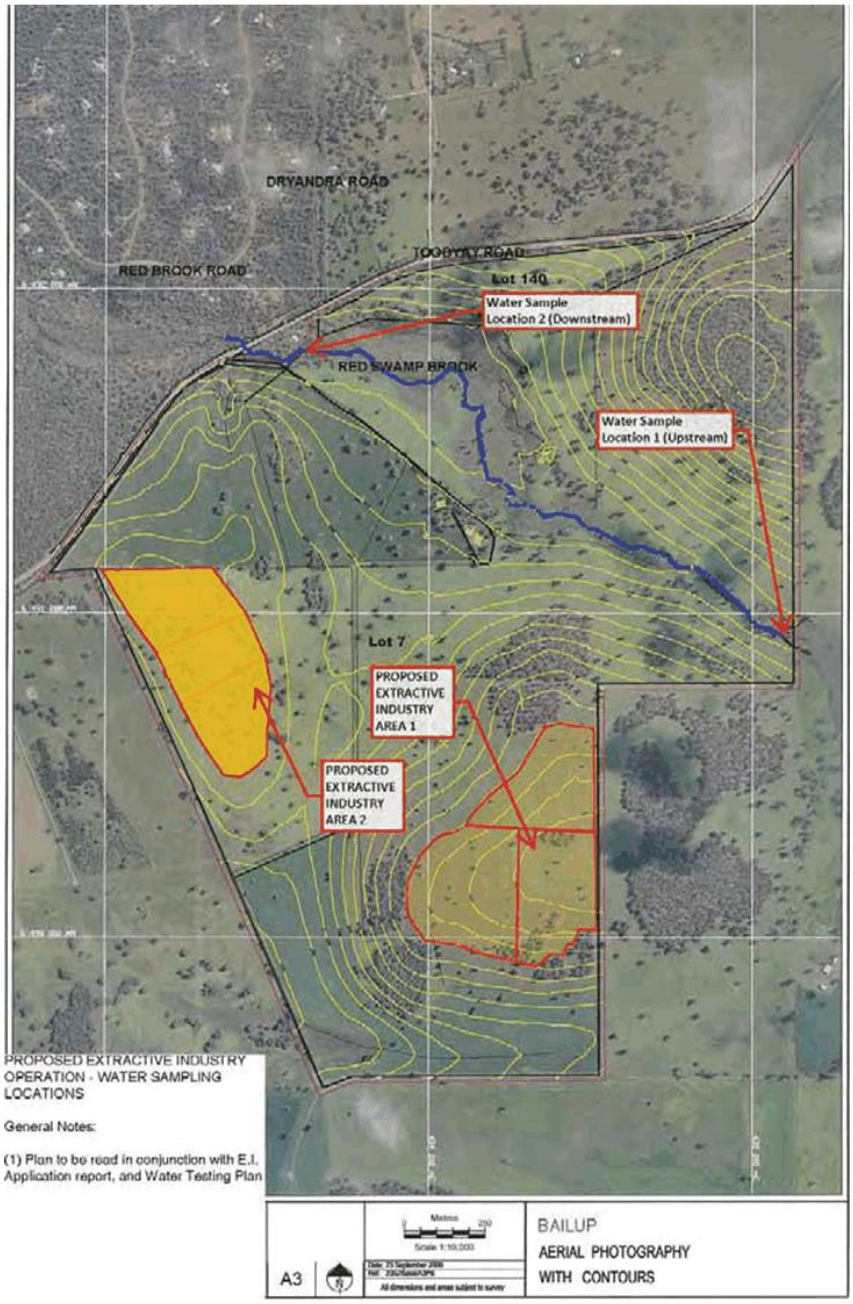
LOT 7 TOODYAY ROAD BAILUP

DIAGRAMMATIC OF HALE BALE SEDIMENT TRAP

LOCATED STRATEGICALLY AT GULLIES WHERE STORMWATER FLOWS OFF THE WORKS AREA

APPENDIX 2C

Site Plan; Water Sample Locations



Appendix 2D

Schedule of Water Quality Testing & Action Plan

Water Quality Test Action	Description/Detail
Water sample location	Water taken from flowing Red Swamp Brook at point entering The Site (south) and at point leaving The Site north).
Frequency	July every year.
Qualitative Criteria	▪ Acidity (pH); ▪ Electrical Conductivity (EC); ▪ Total suspended solids; ▪ Turbidity; ▪ Nutrients (Ammonia and Nitrate levels, Total Phosphorous, Total nitrogen); ▪ Suite of Metals (Aluminium, Iron, Copper, Cadmium, Chromium, Nickel and Lead);
Comparative Analysis	▪ Comparison between water sample entering and leaving site. ▪ Comparison with control sample. ▪ Comparison with historical records.
Triggering Event	A change of 25% in qualitative criteria; or, Comparative Analysis exceeding Contamination levels above *ANZECC & ARMCANZ guidelines (2000) for fresh water in slightly to moderately disturbed ecosystems*.
Reporting	Copy of Tests results and comparative analysis issued to Shire of Mundaring Environmental Officer.

Appendix D

Waterdirect Pty Ltd

25 August 2010
Project No. 00244
Ref: AB

Elswick Developments Pty Ltd
945 Abernethy Road
Oakford WA 6121

Attention: Mr Ren Lexander

Subject: Lot 7 Toodyay Road, Bailup

Dear Sir,

This letter is being written to support the sustainability for a soak/dam being used for dust suppression purposes during extractive operations at Lot 7 Toodyay Road, Bailup. The soak/dam has not been pump tested to determine inflow rates.

1. Requirements

The water requirement for the dust suppression has been estimated at 45 kilolitres (kL) per day. The water will mainly be required in the hotter months and it is anticipated that the use will be for approximately 100 days per year. The total annual water requirement for dust suppression would be in the order of 4,500kL per annum.

2. Source

The source of the dust suppression water supply is a small soak/dam located in the south-western corner of the property. The location of the soak/dam is 433820E 6489610N. The soak/dam has been constructed to enable stock to get to water without getting stuck in waterlogged ground and is approximately 20 metres long and 12 metres wide and is located on the southern side of a spring-fed water logged area. Assuming

Water Direct Pty Ltd
PO Box 3135, Perth Adelaide Terrace WA 6832
Phone: 08 9325 3966, Facsimile: 08 9325 3988
Email: rianmoore@wdl.com.au

an average depth of 1m the soak/dam would have a capacity of approximately 240kL or several days requirement

3. Topography

The property is located on the Darling Plateau which represents an ancient erosion surface that has been dissected by streams and rivers. The highest portions of the Darling Plateau consist of pisolitic laterite gravels that form flat topped hills. The two highest hills on Lot 7 consist of up to a 15m thickness of lateritic gravels with the highest having an elevation of nearly 340m AHD. The lowest portions of the property are to the north on Red Swamp Brook where the elevation drops to approximately 260m AHD.

4. Rainfall

The nearest reliable weather station is the Noble Falls (9252) that has a reliable rainfall record from 2001 to present. The average annual rainfall over this period has been approximately 745mm.

5. Geology

The tops of the hills on Lot 7 are pisolitic lateritic gravels. These are very freely draining sands and gravels and drainages are generally absent on the tops of the hills. Immediately below the lateritic gravels is a weathering lithology that is composed of clays that are nearly impervious. Underlying the laterite and clays are granitic and migmatitic rocks of Archaean age.

6. Hydrogeology

The groundwater found on the Darling Plateau is generally very shallow and referred to as surficial water. The surficial aquifers are generally small and yield limited supplies of fresh to brackish water. The aquifers consist of thin generally sub-horizontal layers of

laterite and sands or sands. At Lot 7 the aquifer supplying the soak/dam is composed of thin sands below a lateritic capping.

The groundwater that is contained in the water-logged area originally started as rainfall. A portion of the rainfall that reaches the ground may in the correct circumstances percolate into the laterite or sands and become groundwater. The rain water will travel vertically downwards through the lateritic gravels until it reaches the underlying clays which as described earlier are nearly impervious. When the groundwater reaches the underlying clays the movement changes from vertical to horizontal and the water moves towards the edges of the lateritic capping and the waterlogged area. In the vicinity of the waterlogged area the groundwater appears to reach the surface at an elevation of approximately 280m AHD. From the edges of the laterite to the soak/dam the water moves through a thin layer of sands and residual gravels that have resulted from the weathering of the lateritic cap.

If this water is not utilised it continues moving westwards down the valley and at the western end of the waterlogged area is absorbed back into the ground. There does not appear to be any significant groundwater dependent ecosystems relying on the groundwater to the west of the water logged area.

7. Source Sustainability

The amount of rainfall entering the lateritic gravels depends on the physical area of the laterite. To the east of the water logged area on Lot 7, the area that could act as the recharge area is approximately 30 hectares. If the rainfall recharge is conservatively estimated at 10% of annual average rainfall or 0.0745m then the possible recharge from Lot 7 alone would be in the order of 22,305kL per annum. The lateritic hill to the immediate south of Lot 7 would have a similar annual contribution of groundwater to the water logged area. The resultant out-flow from the base of the laterite capping would be in the order of 45,000kL per annum or ten times the water required for the dust suppression.

The clearing of the original forest from the laterite areas has resulted in an increase in the amount of rainfall recharging the aquifer. The increase has resulted in an increase in water logging in areas were groundwater reaches the surface and in some cases has

resulted in rising salinity problems. At Lot 7 it is most likely that the rainfall recharge is significantly higher than 10% which would result in a significantly higher amount of groundwater being available.

8. Contingency

Should the supply of groundwater to the soak/dam be temporarily depleted then the Extractive Industry Dust Management Plan shall prescribe alternative dust control measures until more water becomes available.

9. Conclusions

- The proposed extractive industry operation at Lot 7 Toodyay Road, Bailup, has a dust suppression water requirement estimated at 45kL per day for approximately 100 days per year or 4,500kL per annum.
- The soak/dam in the southern portion of the property has been identified as the likely source of the dust suppression water.
- The groundwater contained in the water logged area around the soak/dam is originally sourced from rainfall that falls on the lateritic gravels that form the hill tops in the Bailup area and then moves under the influence of gravity through the gravels until it reaches the underlying clays and then to the edges of the laterite cap.
- Recharge from rainfall is conservatively estimated at 10% of total rainfall. The area above the water logged area to the north, east and south has an approximate area of 60 hectares. The rainfall at the nearest rainfall recording station at Noble Falls indicates that the average rainfall is 745mm per annum. Therefore the potential recharge to the aquifer from rainfall is conservatively estimated at 45,000kL per annum.
- Should the supply of groundwater to the soak/dam be temporarily depleted then the Extractive Industry Dust Management Plan shall prescribe alternative dust control measures until more water becomes available.

10. Recommendations

The groundwater causing the waterlogged area around the soak/dam should be capable of supplying 4,500kL per annum based on the rainfall recharge calculation. However, the rate at which the soak/dam will recharge has not been tested. A shallow drain running north of the dam across the waterlogged area and connected to the soak/dam would assist in catching more of the groundwater.

We trust this information is sufficient for your immediate purposes. Please do not hesitate to call should you have any queries or require additional information.

Yours faithfully

Water Direct Pty Ltd

RIAN MOORE
Hydrogeological Project Manager

Government of Western Australia
Department of Indigenous Affairs

Appendix E

ENQUIRIES : Sally McGann - Ph 08 9235 8138

OUR REF: 02/0569-02

YOUR REF: ID 60653

Mr David Chidlow
Senior Planning Officer
Shire of Mundaring
7000 Great Eastern Highway
Mundaring WA 6073

Dear Mr Chidlow

3650 (LOT 7) TOODYAY ROAD BAILUP PROPOSED EXTRACTIVE INDUSTRY

Thank you for your information regarding the Proposed Extractive Industry at 3650 (Lot 7) Toodyay Road, Bailup (the Proposal).

A search of the Register of Aboriginal Sites (Register) held by the Department of Indigenous Affairs (DIA) revealed that there is one site under the *Aboriginal Heritage Act, 1972,* (AHA) within the Proposal area:

DIA 3536 (Swan River)

It is possible that there are sites that have not yet been entered on the Register of Aboriginal Sites. The AHA protects all Aboriginal sites in Western Australia whether they are known to the DIA or not.

Please note that the provision of this information is not to be considered as a clearance (as DIA does not have the power to give approvals; rather DIA's role is to provide advice regarding heritage issues). The procedures to enable all relevant parties to follow the requirements of the AHA are outlined below.

Prior to any proposed development, so that no site is damaged or altered (which would result in an offence under section 17 of the AHA), it is recommended that suitably qualified consultants be engaged to conduct ethnographic and archaeological surveys of the area. This should ensure that all Aboriginal interest groups are consulted and that all sites on the designated land are identified and avoided. Such surveys would involve archival research, consultations and on the ground inspections.

It is DIA's preference that any development plans are modified to avoid damaging or altering any site. If this is not possible, and in order to avoid committing an offence under the AHA,

1st Floor, 197 St Georges Terrace, Perth, Western Australia 6000
PO Box 7770, Cloisters Square, Perth, Western Australia 6850
Telephone (08) 9235 8000 Facsimile (08) 9235 8088
www.dia.wa.gov.au
wa.gov.au

the landowner should seek the prior written consent of the Minister for Indigenous Affairs to use the land. This involves the submission of a notice in writing under section 18 of the AHA to the Aboriginal Cultural Material Committee.

Additional information on the AHA can be found on the DIA website, under Heritage and Culture.

http://www.dia.wa.gov.au/Heritage--Culture/

If you have any questions in regard to the above, please contact me on 9235 8138.

Yours sincerely

Sally McGann

Sally McGann
Senior Heritage Officer

12 November 2009

Appendix A

BLACK COCKATOO

HABITAT ASSESSMENT

Proposed Gravel Extraction Area

Lot 7

Toodyay Road

Bailup

April 2010
Version 2

On behalf of:
Greenwave Nominees
945 Abernathy Road
OAKFORD WA 6121

Prepared by:
Greg Harewood B.Sc.
A.B.N. 95 536 627 336
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FIGURES

371. INTRODUCTION

This following report details an assessment of potential black cockatoo habitat (foraging, roosting and nesting habitat) located within a proposed gravel extraction area at Lot 7 Toodyay Road, Bailup (the study area). The gravel extraction areas total about 47 ha and are, with the exception of widely scattered trees and some groves of trees largely cleared of native vegetation (Figure 1).

Note: For the purposes of this proposal 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*).

2. SCOPE OF WORKS

To comply with a request from the Mundaring Shire's Environmental Officer a black cockatoo habitat assessment was required to determine the sites importance to these species. The assessment will allow a management plan to be formulated (if required). To comply with these requirement the scope of works was defined as:

1. Habitat Tree Survey (including potential black cockatoo nest hollows) and black cockatoo foraging habitat assessment; and

2. Report summarising results with management recommendations.

3. METHODOLOGY

Potential Nest Hollow and Foraging Habitat Survey

All trees within the proposed clearing areas were assessed for the potential to contain suitable hollows for black cockatoos. Characteristics of each tree recorded will include tree species, number, type and size of hollows observed.

For the purposes of this study a potential nest hollow was defined as:

Generally any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) that had an entrance greater than about 12cm in diameter and would allow the entry of a cockatoo (white tailed or red-tailed) will be recorded as a "potential nest hollow".

It should be noted that the assessment of hollows from ground level using this method is likely to result in an over estimation of the number of hollows that would be suitable for use by black cockatoos as the full characteristic of the

hollow cannot be made. The method will however provide an idea of the relative abundance of hollows.

In addition any direct observations of black cockatoo individuals or evidence of foraging/roosting will be recorded to species level if possible.

Vegetation units will be examined during the field survey work and their value as cockatoo foraging habitat will be noted along with any actual evidence of foraging

Report

- Preparation of a draft report for review summarising all results with discussion of implications of any proposed development and potential management measures;

- Preparation of a final report.

Field survey work was carried out by Greg Harewood on the 7th April 2010.

4. BLACK COCKATOO - SPECIES PROFILES

All three Black Cockatoo species are listed as specially protected (Schedule 1 - Fauna that is rare or is likely to become extinct) under the Western Australian Wildlife Conservation Act (*WC Act 1950*). Under the federal Environment Protection and Biodiversity Conservation Act (*EPBC Act 1999*) the Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo are listed as Vulnerable, while Carnaby's are listed as Endangered.

Carnaby's Black- Cockatoo *Calyptorhynchus latirostris*

Status and Distribution: Carnaby's Black Cockatoo is listed as Scheduled 1 under the *WC Act (1950)* and as Endangered under the *EPBC Act (1999)*. The species was once common, but is now in dramatic decline (Shah 2006). In the last 45 years the species has suffered a 50% reduction in its range and abundance, and is now locally extinct in some areas (Shah 2006). The total population of Carnaby's Cockatoo is currently estimated at 40 000 (Johnstone & Johnstone 2008).

The species is confined to the south-west of Western Australia, north to the lower Murchison River and east to Nabawa, Wilroy, Waddi Forest, Nugadong, Manmanning, Durokoppin, Noongar (Moorine Rock), Lake Cronin, Ravensthorpe Range, head of Oldfield River, 20 km ESE of Condingup and Cape Arid; also casual on Rottnest Island (Johnstone and Storr 1998). There are small resident populations on the southern Swan Coastal Plain near Mandurah, Lake Clifton and near Bunbury. At each of these sites the birds forage in remnant vegetation and adjacent pine plantations (Johnstone 2008).

Habitat: Inhabits forests, woodlands, heathlands, farms. Carnaby's Cockatoos feed on seeds, nuts and flowers of a variety of native proteaceous species including *Banksia, Hakea, Grevillea, Allocasuarina, Eucalyptus and Corymbia calophylla* nuts, and seeds from the cones of *Pinus* spp. (Shah 2006). Pine (Pinus spp.) plantations in the coastal zone are now important feeding areas in the non-breeding season (Cale 2003).

This species is a postnuptial nomad, tending to move west with its young after breeding, often to non-breeding areas. In the non-breeding season (late spring to mid-winter), it congregates in large flocks of up to 15, 000 birds (Johnstone & Johnstone 2008). In some areas these flocks forage within 50 km of their breeding areas, whilst in other areas the flocks move to the coast, where heath, Banksia woodland and pine plantations are concentrated (Cale 2003). For example, most birds breeding in Three Springs, Carnamah, Coorow, Badgingarra, Dandaragan and Moora regions tend to move west after breeding into higher rainfall areas, especially the near-coastal Banksia woodland at Wanagarren Nature Reserve, Nilgen Nature Reserve, the Yanchep area (especially Yanchep National Park), Pinjar, Tamala Park and Gnangara areas, then many of these move further south onto the Swan Coastal Plain, including the southern Perth metropolitan area around Baldivis, Lake Clifton and Myalup (Johnstone & Johnstone 2008).

In the midlands region of the Wheatbelt and on the northern Swan Coastal Plain, pairs begin to move back to their breeding sites in July-August, some as late as mid-November (Johnstone & Johnstone 2008).

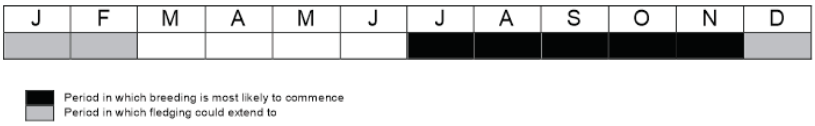
During February, March and April (and occasionally into May) large transit flocks of up to 7000 forage at major food sources, including Banksia or Kwongan heaths and Pinus plantations on the Swan Coastal Plain (Johnstone & Johnstone 2008).

Hollow Requirements: Carnaby's Cockatoo has specific nesting site requirements. Nests are mostly in smoothed-barked eucalypts with the nest hollows ranging from 2.5 to 12m above the ground, an entrance from 23-30cm diameter and a depth of 0.1 - 2.5m. On the Swan Coastal Plain, most nests are in Tuart (Johnstone & Storr 1998). Jarrah rarely produces hollows large enough for Black Cockatoos. From a database of 109 Black Cockatoo nest trees throughout the Jarrah forest only six are located in Jarrah (Kirkby 2009).

Breeding Season: Breeding occurs in winter/spring mainly in eastern forest and the wheatbelt where they can find mature hollow bearing trees to nest in (Morcombe, 2003). Judging from records in the Storr-Johnstone Bird Data Bank, this species is currently expanding its breeding range westward and south into the Jarrah – Marri forest of the Darling Scarp and into the Tuart forests of the Swan Coastal Plain including the region between Mandurah and Bunbury. There are small resident populations on the southern Swan Coastal Plain near

Mandurah, Lake Clifton and near Bunbury. At each of these sites the birds forage in remnant vegetation and adjacent pine plantations (Johnstone 2008).

Carnaby's Black-Cockatoo lays eggs from July or August to October or November, with most clutches being laid in August and September (Saunders 1986). Birds in inland regions may begin laying up to three weeks earlier than those in coastal areas (Saunders 1977). The female incubates the eggs over a period of 28-29 days. The young depart the nest 10–12 weeks after hatching (Saunders 1977; Smith & Saunders 1986).



Breeding birds generally feed within 6-10 km of the breeding site (Johnstone 2008) and no more than approximately 20 km (Saunders 1980), so having sufficient foraging resources close to the breeding area is critical to breeding success. Birds that foraged within one or two kilometres from nesting sites have the greater fledging success (Saunders 1980).

Likely presence in study area: The study area is within the current documented range of this species and it is probably a common, relatively frequent visitor to the general area.

Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*

Status and Distribution: Listed as Scheduled 1 under the *WC Act (1950)* and as Vulnerable under the *EPBC Act (1999)*. Found in the humid and subhumid south west, mainly hilly interior, north to Gingin and east to Mt Helena, Christmas Tree Well, North Bannister, Mt Saddleback, Rock Gully and the upper King River (Johnstone and Storr 1998).

Habitat: Eucalypt forests, feeds on Marri, Jarrah, Blackbutt, Karri, Sheoak and Snottygobble (Johnstone and Storr 1998).

Hollow Requirements: The Forest Red-tailed Black Cockatoo nests in the large hollows of Marri, Jarrah and Karri (Johnstone and Kirkby 1999). In Marri, the nest hollows of the Forest Red-tailed Black Cockatoo range from 8-14m above ground, the entrance is 12–41cm in diameter and the depth is one to five metres (Johnstone and Storr 1998)

Breeding Season: Breeding commences in winter/spring. There are few records of breeding in the Forest Red-tailed Black Cockatoo (Johnstone and Storr 1998), but eggs are laid in October and November (Johnstone 1997; Johnstone and

Storr 1998). Incubation period 29 – 31 days. Young fledge at 8 to 9 weeks (Simpson and Day 2004).

J	F	M	A	M	J	J	A	S	O	N	D

Period in which breeding is most likely to commence
Period in which fledging could extend to

Likely presence in study area: The study area is within the current documented range of this species and it is probably a common and frequent visitor to the general area.

Baudin's Black- Cockatoo *Calyptorhynchus baudinii*

Status and Distribution: Listed as Scheduled 1 under the *WC Act (1950)* and as Vulnerable under the *EPBC Act (1999)*. Confined to the south-west of Western Australia, north to Gidgegannup, east to Mt Helena, Wandering, Quindanning, Kojonup, Frankland and King River and west to the eastern strip of the Swan Coastal Plain including West Midland, Byford, Nth Dandalup, Yarloop, Wokalup and Bunbury (Johnstone and Storr 1998).

Habitat: Mainly eucalypt forests where it feeds primarily on the Marri seeds, (Morcombe, 2003), banksia, hakeas and *Erodium* sp. Also strips bark from trees in search of beetle larvae (Johnstone and Storr 1998).

Hollow Requirements: The cockatoos nest in large tree hollows, 30–40 cm in diameter and more than 30 cm deep (Saunders 1974).

Breeding Season: Baudin's Black-Cockatoo breeds in late winter and spring, from August to November or December (Gould 1972; Johnstone 1997; Saunders 1974; Saunders *et al*. 1985). Eggs laid in October (Johnstone and Storr 1998). Incubation is 28 – 30 days. Young fledge at 8 to 9 weeks (Simpson and Day 2004).

J	F	M	A	M	J	J	A	S	O	N	D

Period in which breeding is most likely to commence
Period in which fledging could extend to

Likely presence in study area: The study area is near the northern limit of this species documented range. This species probably visits the general area in low numbers on a relatively infrequent basis.

5. RESULTS

The extraction of gravel is to be carried out in two areas (gravel extraction area 1 and gravel extraction area 2 – see Figure 1).

Area 1 is about 29 ha in size and was found to contain about 23 scattered Jarrah and Marri trees in addition to two groves of trees. The northern most grove has an area of about 0.4ha, the southernmost about 1.0 ha. The groves of trees are dominated by Jarrah and Marri but also contain some Banksia specimens (*Banksia grandis* and *Banksia sessilis*)

Area 2 is about 18 ha in size and contains about 35 scattered Jarrah and Marri trees.

5.1 POTENTIAL BLACK COCKATOO NEST HOLLOW ASSESSMENT

Two trees within the study area (both in Area 1) were observed to contain hollows that, from ground level, appeared to have entrances of a size possibly suitable for black cockatoos to use for nesting purposes. No evidence of any hollow actually being in use or previously used by black cockatoos was seen. The location of the trees is shown in Figure 2.

Most of the trees present within the study site that could develop hollows (Jarrah and Marri) are all relatively young or stunted and do not appear to contain hollows of any size.

5.2 FORAGING HABITAT

Evidence of foraging by Carnaby's Black Cockatoo was observed within Area 2 in the form of chewed Marri seeds. Irrespective of the amount of actual foraging evidence observed most of the vegetation on site can be considered potential black cockatoo foraging habitat i.e. any Jarrah, Marri or Banksia tree/shrub.

5.3 ROOSTING HABITAT

Evidence of past use as a roosting site (significant concentrations of feathers and droppings) was searched for during the day time field survey. No evidence of previous roosting on site was observed. It is the Authors opinion that the site is probably not ideal as a roosting location due to the fact that most of the trees present are isolated single trees and/or are relatively small in size.

No black cockatoos were observed in or near the site during the survey work.

6. MANAGEMENT RECOMMENDATIONS

The most likely impacts of the of the proposed clearing works are

- Loss of potential nest hollows and foraging habitat;
- Potential for fauna to be killed or injured during clearing and ongoing operations at the site.

Overall the potential impact of the proposal on black cockatoos can be considered to be extremely low given the area of potential habitat to be cleared is small and there are only two potentially inhabitable trees. This can easily be more than offset through implementation of the revegetation program. Similar and better quality habitats are common and widespread in the general area (e.g. areas of State Forest). Existing black cockatoo populations using the general area (either on a permanent basis or as seasonal visitors) will not be significantly affected by the loss of this small area of habitat. The following recommendations are provided to further minimise the potential impact of the proposal and should be implemented if considered reasonable and practicable. It is recommended that:

- A revegetation plan should be formulated that includes the planting of local tree species and cockatoo food plants to offset the loss of potential black cockatoo habitat. (It is understood that a comprehensive revegetation plan has already been made and complies with this recommendation).
- During site works areas/individual trees requiring clearing should be clearly marked to reduce the likelihood of vegetation being removed unnecessarily.
- While the probability that any of the black cockatoo species utilises any trees within in the clearing footprint for breeding is very low, the documented breeding and fledging times of the respective species (see section 4) suggests that the best time to carry out clearing at the site would be in April/May/June so as to avoid the peak breeding times for all species in question. It would also be possible to carry out observations of potential nest hollows to establish if they were in use if clearing needed to be undertaken at other times.
- All staff working on site should be made aware that native fauna is protected by law. If feasible any fauna encountered should be relocated to suitable retained habitat nearby.

7. BIBLIOGRAPHY

(not necessarily cited)

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TRICO RESOURCES PTY LTD

GRAVEL EXTRACTION OPERATIONS

LOT 7 TOODYAY ROAD, BAILUP

ACOUSTIC ASSESSMENT

JANUARY 2015

OUR REFERENCE: 18713-1-14245

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ACOUSTIC ASSESSMENT
BAILUP

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CONTENTS

APPENDICIES

1. INTRODUCTION

Herring Storer Acoustics was commissioned by TriCo Resources Pty Ltd to undertake an acoustic assessment of noise emissions from a proposed gravel extraction operation site located at Lot 7 Toodyay Road, Bailup.

The gravel extraction component of the operations entails the usage of a mobile crusher and screen. The gravel is removed from one of two pits using a dozer (ripping) and a front end loader (loading ore). The ore is transported via quarry truck to a processing area. Once the ore is processed (crushed and screened) the gravel is stockpiled and transported off site via road haulage (semi-tippers).

This assessment takes into account the cumulative noise level of both the gravel extraction in either one of two pits, and the processing of the ore at a dedicated processing area. The assessment is provided to support the works approval process.

Operational hours for the site are proposed to be Monday to Saturday 07:00 to 17:00 hours (excluding Public Holidays).

As part of the study, the following was carried out:

- Identification of individual operations and the associated noise levels, including extraction at Area 1 and 2, and processing of the ore.
- Assess the predicted individual and cumulative noise levels at the nearest surrounding noise sensitive premises for compliance with the appropriate criteria.
- If exceedences are predicted, comment on possible noise amelioration options for compliance with the appropriate criteria.

For information, a locality plan is shown in Appendix A.

2. SUMMARY

Assessment has been conducted on the proposed gravel extraction operation at Lot 7 Toodyay Road, Bailup.

The facility would only operate during the day period (i.e. Monday to Saturday 0700 to 1700 hours, but excluding Public Holidays). Therefore, at the neighbouring residences, the applicable acoustic criteria for this assessment are the assigned L_{A10} day period noise level of 45 dB(A).

Noise received at the residential premises has been determined, to be 45 dB(A) for the gravel extraction with the main contribution of the noise sources being from truck pass by events on the access road. This can be compared to the applicable assigned noise level criteria of 45 dB(A).

The above noise levels have been considered to contain tonal characteristics, therefore contain a +5 dB(A) penalty.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

3. CRITERIA

The allowable noise level at the surrounding locales is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 & 8 stipulate maximum allowable external noise levels determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern.

TABLE 1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF
Industrial and Utility Premises	All Hours	65	80	90

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 2 below.

TABLE 2 - ADJUSTMENTS TO MEASURED LEVELS

Where **tonality** is present	Where **modulation** is present	Where **impulsiveness** is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

The nearest potential noise sensitive premises to the proposed development have been identified using the area map in Figure 1. Due to location of the premises and the proposed development being classified as industrial, the influencing factor has been assessed as 2 dB(A) for residence A and B. It is noted that the residence situated near to the proposed development is associated with the proposal, therefore has been considered as a "Caretaker" dwelling.

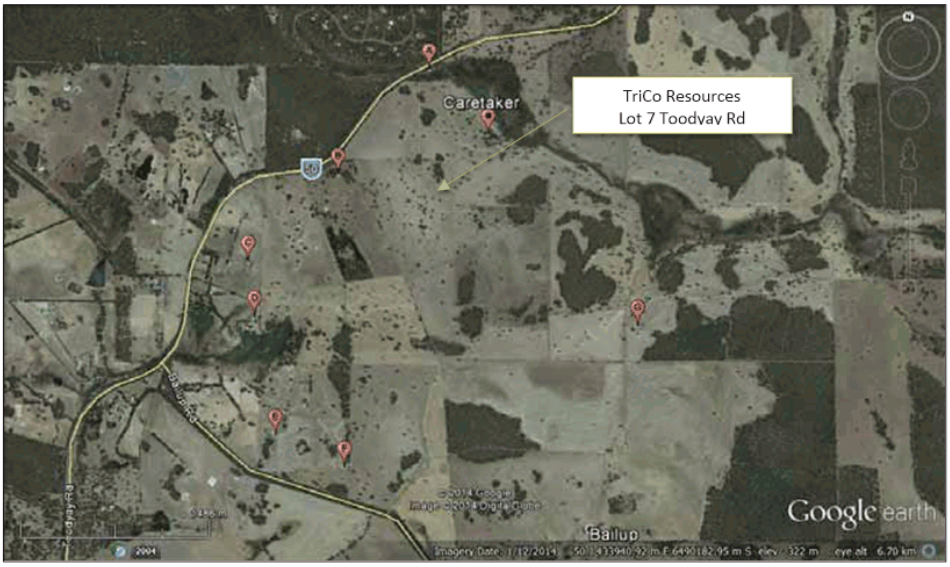


FIGURE 1 – RECEIVER LOCATIONS

The influencing factor at the closest residence has been assessed as 2 dB(A). Therefore the assigned noise level is as noted in Table 3.

TABLE 3 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Receiver A and B	0700 - 1900 hours Monday to Saturday (Day)	47	57	67
Receiver C to G	0700 - 1900 hours Monday to Saturday (Day)	45	55	65

4. CALCULATED NOISE LEVELS

Noise imissions[1] at the nearest neighbouring residential premises, due to noise associated with the proposed gravel extraction operations, were modelled with the computer programme SoundPlan. Sound power levels used for the calculations are based on measured sound pressure levels of similar equipment proposed for use on site.

The modelling of noise levels has been based on noise sources and sound power levels shown in Table 4.

1 Immissions – noise received at a source
2 Emissions – noise emanating from a source and / or location

TABLE 4 – SOUND POWER LEVEL - NOISE SOURCES dB(A)

Element name	Unit	Frequency Hz										dB(A)
		31.5	63	125	250	500	1k	2k	4k	8k	16k	Sum
Small Excavator (PC300 etc)	dB(A)/unit	62	83	89	89	92	92	91	87	79	-	98
Crusher (Terex J1175)	dB(A)/unit	57	81	97	94	101	103	103	99	92	80	113
		65	82	90	96	103	104	101	97	89	-	
		70	88	95	97	103	103	101	95	85	-	
Screening Plant	dB(A)/unit	66	80	84	90	93	95	95	95	87	-	101
Dozer	dB(A)/unit	55	72	86	92	99	99	99	97	91	83	109
		57	72	89	89	97	100	101	95	88	80	
		64	81	94	95	95	98	97	93	86	79	
Truck and Water Truck	dB(A)/unit	60	71	82	85	97	91	89	85	80	72	102
		64	75	83	89	93	91	87	83	78	70	
		66	72	82	87	91	89	85	81	75	66	
Loader WA430	dB(A)/unit	46	72	73	80	86	93	90	87	82	69	105
		48	60	70	81	89	93	91	86	78	63	
		58	68	76	85	91	91	89	88	73	54	
CAT 740 Quarry Truck	dB(A)/unit	55	86	87	90	91	96	93	89	80	66	106
		65	77	97	84	90	94	93	87	78	63	
		67	89	97	85	98	96	89	84	73	61	

Based on noise emissions[2] from the above equipment, three operating scenarios have been developed. These scenarios represent periods of worst case noise emissions for the entire operations. These scenarios are as listed in Table 5:

TABLE 5 – MODELLED SCENARIOS

Equipment	Scenario 1 Processing Only (No Gravel Extraction)	Scenario 2 Area 1 Gravel Extraction and Processing	Scenario 3 Area 2 Gravel Extraction and Processing
Crusher	1	1	1
Screen	1	1	1
Front End Loader	1	2	2
Excavator	-	1	1
Dozer	-	1	1
Truck (Road Transport)	3	3	3
Truck (Quarry Truck)	-	2	2
Water Cart	1	1	1

Grave extraction in Areas 1 and 2 have been assumed to be 8 metres below natural ground height, as this is the expected depth of the ore.

The design layout and site configuration, including source location is shown in Appendix A, Figure 2.

This is understood to be representative of the maximum noise levels associated with the proposed gravel extraction site.

The following input data was used in the calculations:

a) Google Earth backgrounds.
b) Sound Power Levels listed in Table 4.
c) Ground contours from the previous study, updated via Google Earth

Weather conditions for modelling were as stipulated in the Environmental Protection Authority's *"Draft Guidance for Assessment of Environmental Factors No. 8 - Environmental Noise"* and for the day period are as listed in Table 6.

TABLE 6 – WEATHER CONDITIONS

Condition	Day
Temperature	20°C
Relative humidity	50%
Pasquill Stability Class	E
Wind speed	4 m/s*

* From sources, towards receivers.

5. RESULTS

Calculated noise levels associated with the noise emissions from the proposed gravel extraction for the assumed scenarios, are summarised below in Table 7. For the receiver with the highest noise level, for each scenario, the source contribution for individual plant is shown in Table 8.

TABLE 7 – CALCULATED NOISE LEVEL – NO NOISE CONTROL

Receiver	Scenario 1	Scenario 2	Scenario 3
	Processing Only (No Gravel Extraction)	Area 1 Gravel Extraction and Processing	Area 2 Gravel Extraction and Processing
A	40*	40*	41
B	33	34	47*
C	26	28	30
D	25	28	26
E	22	26	26
F	23	27	27
G	19	21	19

*Source contribution details contained in Table 8.

TABLE 8 – SOURCE CONTRIBUTION – NO NOISE CONTROL

Receiver A (40dB(A))		Receiver A (40dB(A))		Receiver B (47dB(A))	
Scenario 1		Scenario 2		Scenario 3	
Truck 3	39.0	Truck 3	39.0	Dozer	42.7
Crusher	31.5	Crusher	31.5	Front End Loader	41.0
Truck 2	30.4	Truck 2	30.4	Quarry Truck	40.4
Truck 1	23.3	Quarry Truck	23.5	Water Cart	33.2
Front End Loader	23.1	Truck 1	23.3	Truck 2	26.9
Screen	19.1	Front End Loader	23.1	Truck 1	26.6
Excavator	17.3	Screen	19.1	Front End Loader	24.9
		Excavator	17.3	Crusher	24.0
		Dozer	14.6	Screen	21.1
		Front End Loader	13.3	Excavator	19.1
		Water Cart	7.2	Truck 3	18.4

Note: Whilst it is normal practice to round values to whole numbers, for the purpose of this assessment values to one decimal place have been used to provide greater clarity.

As can be seen by the calculated noise levels, Receiver A is most affected by Scenario 1 and 2, with Scenario 3 having the highest impact on Receiver B.

For scenarios 1 and 2, due to the distance of the extraction and processing plant from Receiver A noise levels associated with this equipment are relatively low i.e. well below assigned noise levels for day operations. The main contributing factor to noise received at this location is from trucks utilising the access road, which is a closer proximity to the residence. Based on this, information, no further analysis was carried out for scenario 1 and 2, with the assessable noise level detailed in Section 6, Assessment.

Due to the closer proximity of gravel extraction (Area 2), to a noise sensitive premise (Receiver B) there is a potential for noise levels to exceed the criteria. Therefore further investigation into possible noise control has been conducted for equipment operating in Area 2.

The layout plan details an area set aside for topsoil stockpiling. Adaptation of the stockpile has been included in Scenario 3. The addition allows for the extension of the stockpile further north to provide a barrier for equipment operating in this area. The stockpile has an assumed height of 10 metres above natural ground level. Table 9 details the revised noise levels for Scenario 3 at Receiver B, with the inclusion of the stockpile, with Figure 2 showing the proposed location.

TABLE 9 – SOURCE CONTRIBUTION – WITH NOISE CONTROL

Receiver B (38 dB(A)) Scenario 3 (Revised)	
Dozer	29.8
Quarry Truck	28.5
Water Cart	27.0
Truck 1	26.5
Front End Loader	24.9
Front End Loader	24.0
Crusher	21.1
Screen	20.9
Excavator	19.9
Truck 2	19.1
Truck 3	18.2

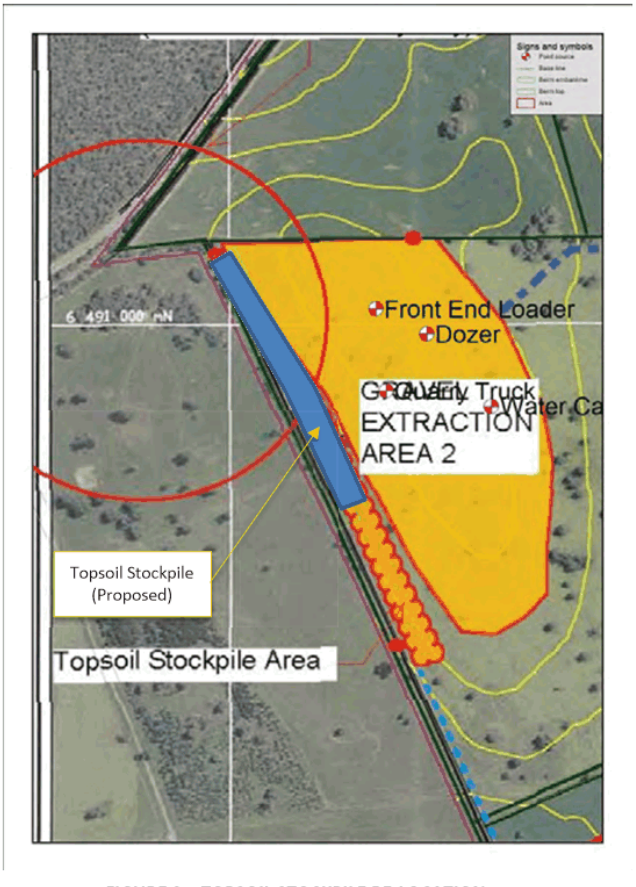


FIGURE 2 – TOPSOIL STOCKPILE RE-LOCATION

6. ASSESSMENT

Based on calculated noise levels at the nearest premises, noise levels could be considered as being tonal in characteristics. Therefore, a +5 dB(A) penalty has been included to allow for a tonal component.

Hence, Table 10 summarises the applicable Assigned Noise Levels, and assessable noise level emissions, for the scenario considered.

TABLE 10 – ASSESSMENT OF NOISE LEVELS

Receiver	Scenario 1	Scenario 2	Scenario 3 (Revised)
	Processing Only (No Gravel Extraction)	Area 1 Gravel Extraction and Processing	Area 2 Gravel Extraction and Processing
A	40 (45)	40 (45)	40 (45)
B	33 (38)	34 (39)	38 (43)
C	26 (31)	28 (33)	27 (32)
D	25 (31)	28 (33)	26 (31)
E	22 (27)	26 (31)	26 (31)
F	23 (28)	27 (32)	27 (32)
G	19 (24)	21 (26)	19 (24)

( ) include a +5 dB(A) penalty for tonal characteristics.

7. DISCUSSION

Noise associated with the proposed site has the greatest impact on noise sensitive premises situated at location A and B. Note, for the purpose of this discussion section, noise levels referenced do not include the +5 dB(A) penalty for tonality, as individual noise sources are being discussed.

Further analysis of the individual noise sources shows that the highest contribution to noise levels at Residence A is truck events on the access road. Plant associated with the extraction and processing is generally around 35 dB(A), with the truck noise at 40 dB(A) for individual events. Whilst the assessment considerers all noise emissions from the site as being present for greater than 10 % of the time, the likelihood is that the individual truck movements would be less than 10% of the time, hence should be considered under the L_{A1} noise descriptor. To provide a conservative assessment, trucks have been grouped with other noise sources on site and the overall noise considered under the L_{A10} noise descriptor. Compliance is still achieved using this criteria, although if required, the truck noise could be separated from the main assessment and considered under the L_{A1} descriptor.

Location B noise levels can be reduced to 38 dB(A) with the re-location of the stockpile of topsoil, which provides a barrier towards the residence. Due to the distance of the truck access route and the fixed plant within the processing area, noise levels are dominated by activities within Area 2. With the inclusion of the bunding as a barrier, noise levels would comply with regulatory criteria for the hours of operations.

8. CONCLUSION

Assessment has been conducted on the proposed gravel extraction operation at Lot 7 Toodyay Road, Bailup.

The applicable criterion for this assessment is 47 dB(A) for the nearest residential locations (A and B).

Noise received at the residential premises has been determined, to be 45 dB(A) for the gravel extraction with the main contribution of the noise sources being from truck pass by events on the access road. This can be compared to the applicable assigned noise level criteria of 47 dB(A).

The above noise levels have been considered to contain tonal characteristics, therefore contain a +5 dB(A) penalty.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

APPENDIX A

FIGURE A1 – LOCATION MAP
FIGURE A2 – RECEIVER LOCATION

FIGURE A1 – SITE LAYOUT

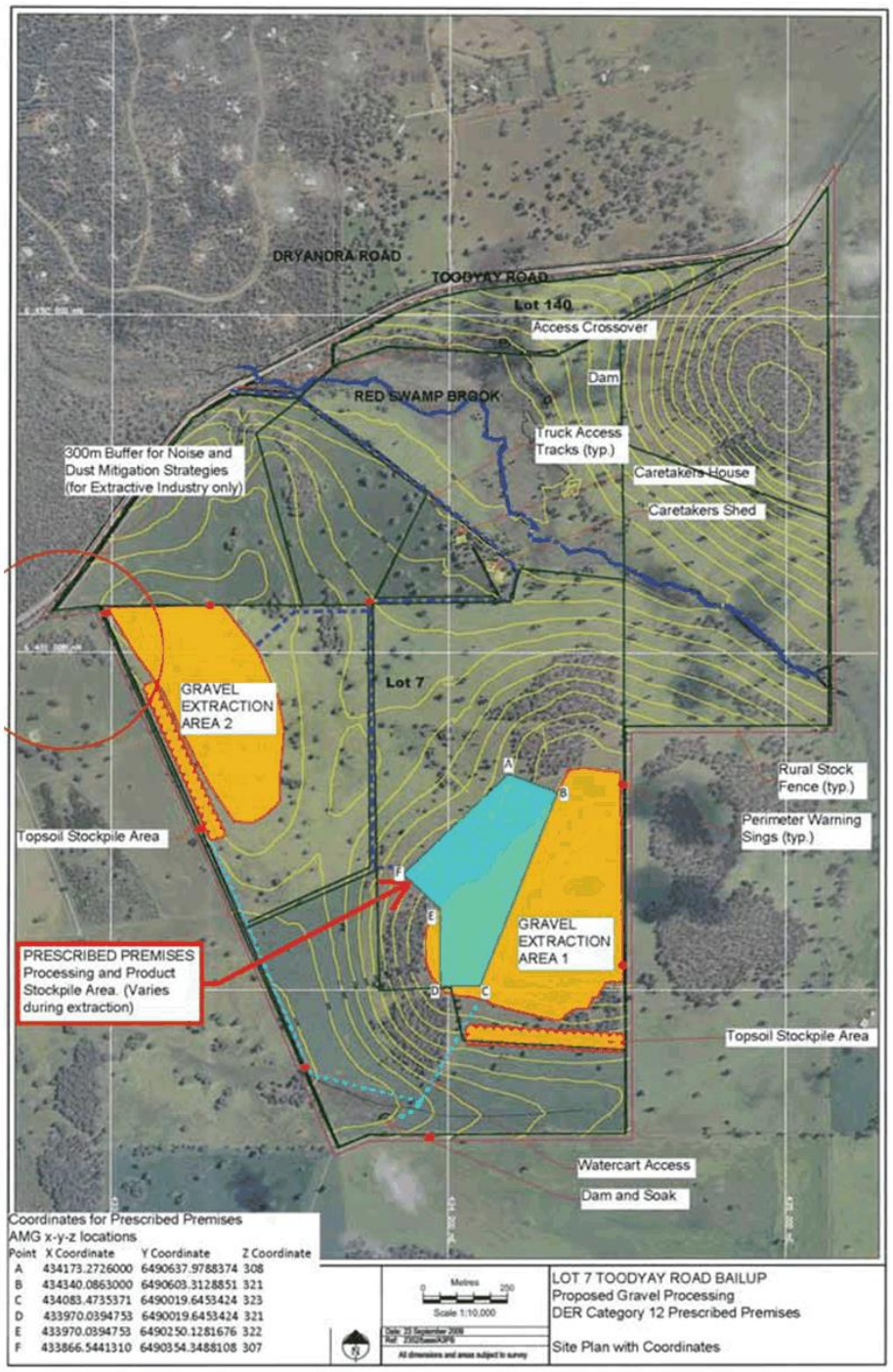
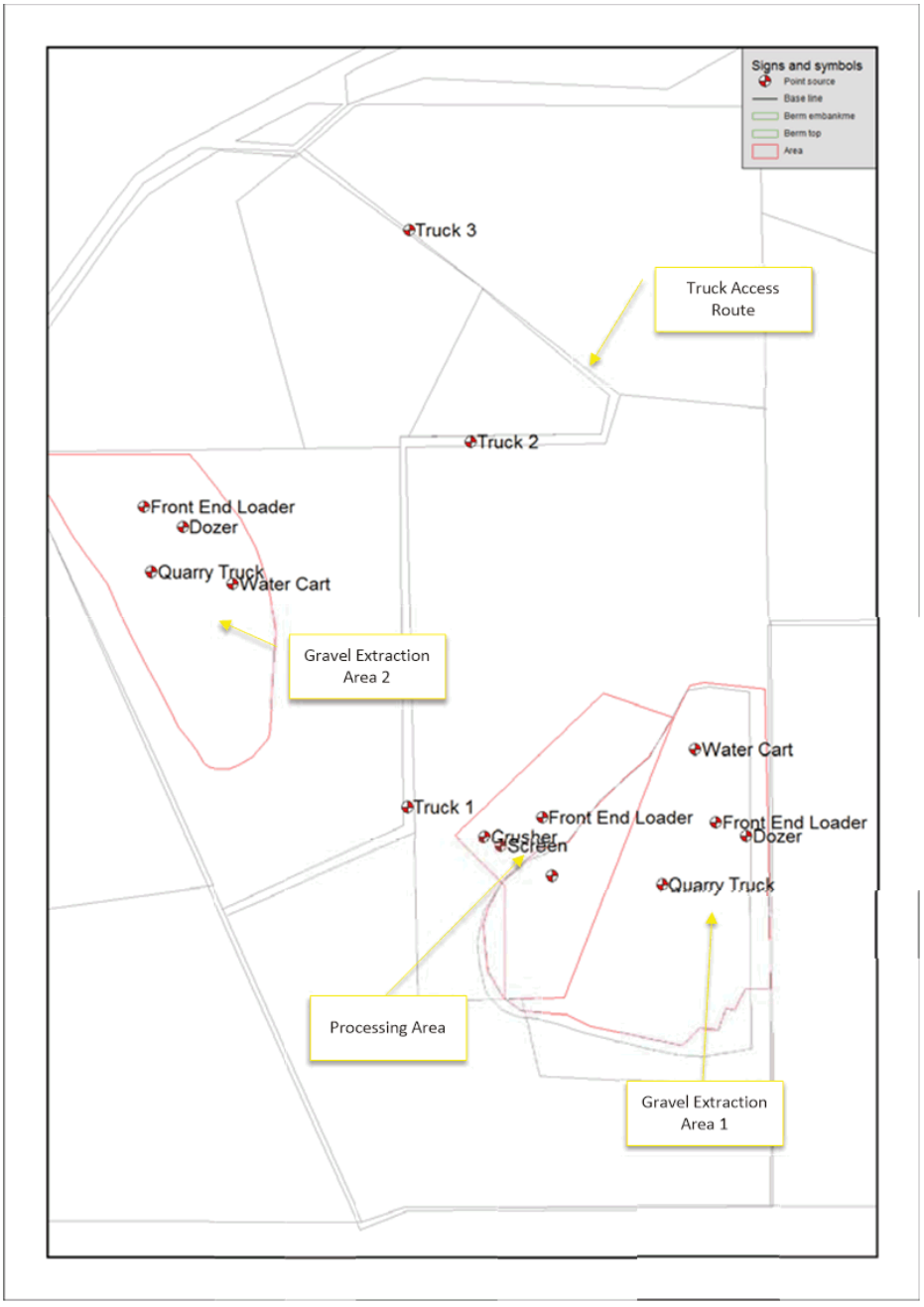
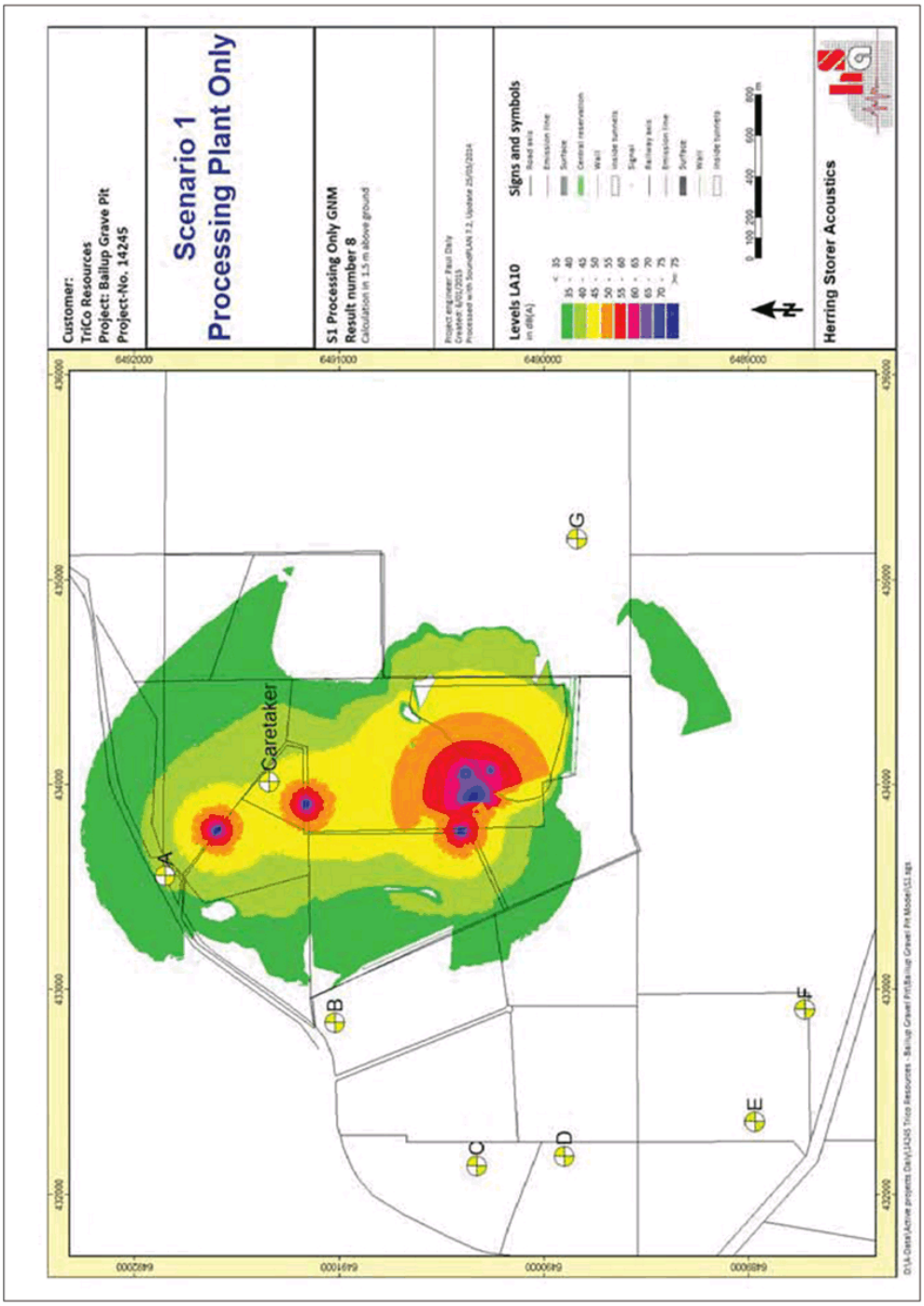


FIGURE A2 – RECEIVER LOCATION



APPENDIX B

Noise Contours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Project-No. 14245
Scenario 1
Processing Plant Only
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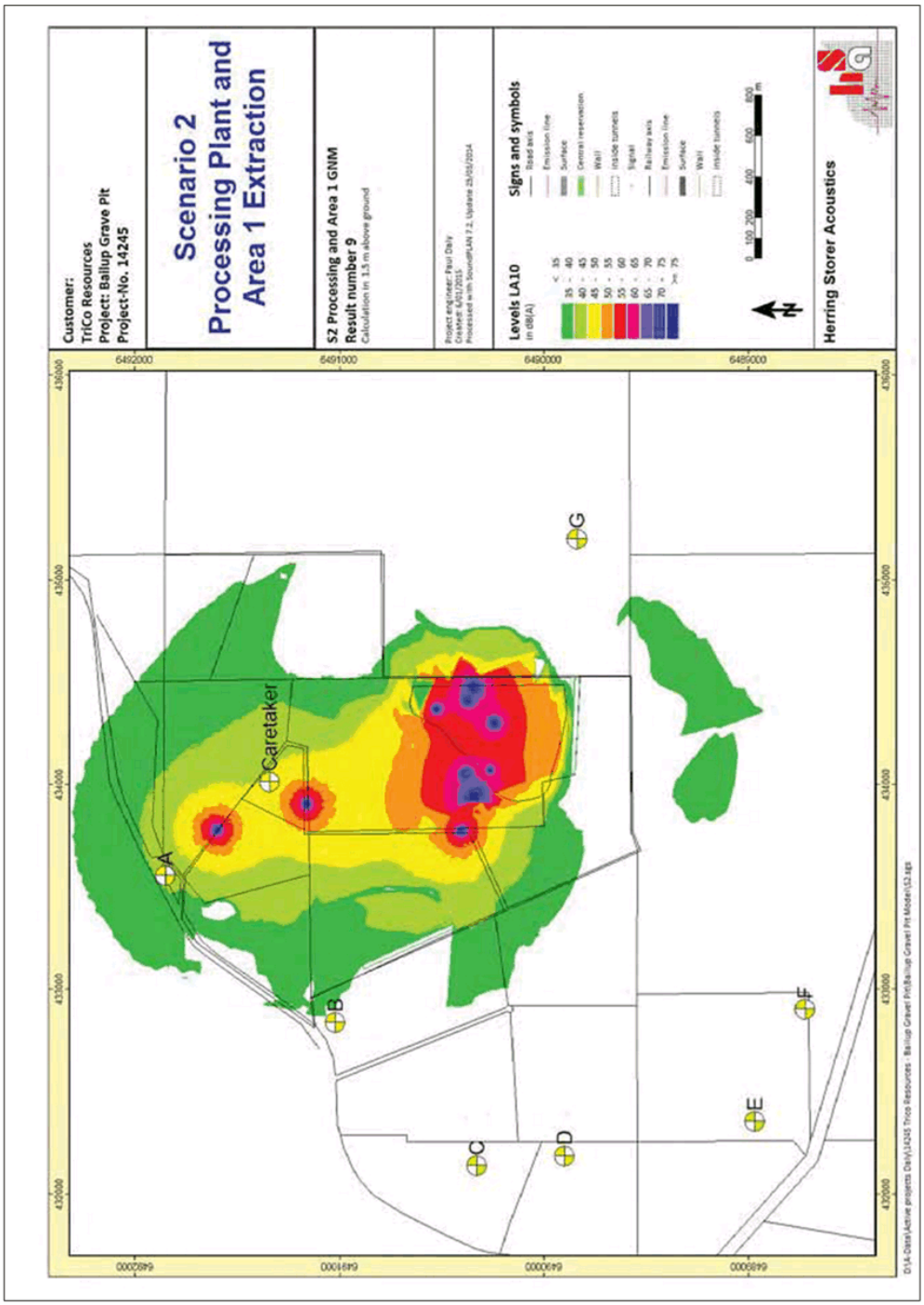
in dB(A)
Signs and symbols
Herring Storer Acoustics
Caretaker
A
B
C
D
E
F
G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Project: Ballup Grave Pit
Project-No. 14245
Scenario 2
Processing Plant and
Area 1 Extraction
S2 Processing and Area 1 GNM
Result number 9
Calculation in 1.5 m above ground
Levels LA10
in dB(A)
Signs and symbols
Herring Storer Acoustics
Caretaker
A
B
C
D
E
F
G
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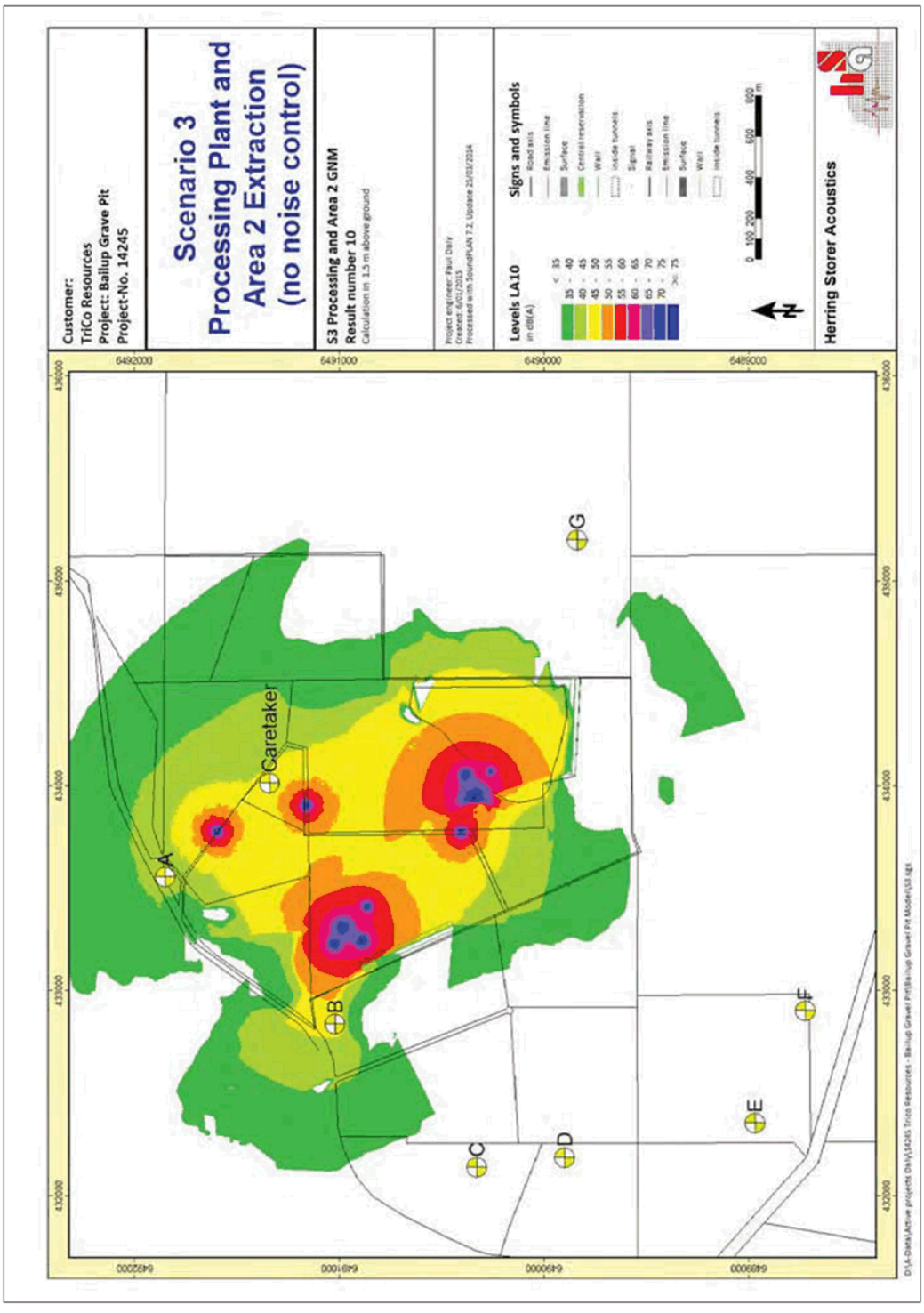
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Project-No. 14245
Scenario 3
Processing Plant and
Area 2 Extraction
(no noise control)
S3 Processing and Area 2 GNM
Result number 10
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Processed with SoundPLAN 7.2, Update 25/03/2014
Levels LA10
in dB(A)
Signs and symbols
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Emission line
Surface
Central reservation
Wall
Inside tunnels
Signal
Railway axis
Emission line
Surface
Wall
Inside tunnels
< 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
>= 75
0 100 200 400 600 800 m
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Herring Storer Acoustics
Caretaker
A
B
C
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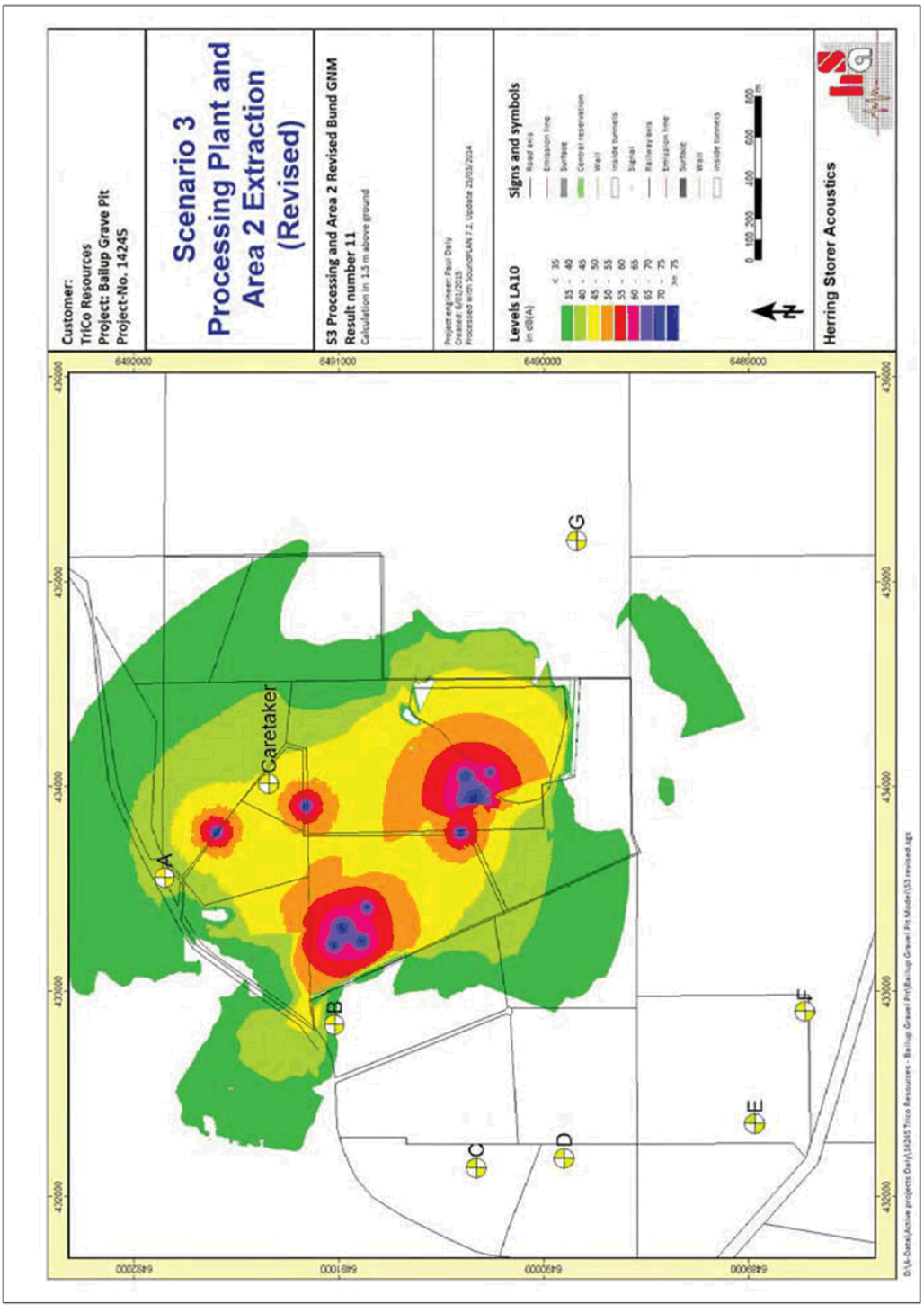
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Project-No. 14245
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Area 2 Extraction
(Revised)
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Processed with SoundPLAN 7.2, Update 25/03/2014
Levels LA10
in dB(A)
Signs and symbols
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Emission line
Surface
Central reservation
Wall
Inside tunnels
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Inside tunnels
< 35
35 - 40
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45 - 50
50 - 55
55 - 60
60 - 65
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70 - 75
>= 75
0 100 200 400 600 800 m
N
Herring Storer Acoustics
6492000
6491000
6490000
6489000
436000
435000
434000
433000
432000
Caretaker
A
B
C
D
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G

Bioscience

Application for Works Approval and Licence

Lot 7, Toodyay Rd.

On behalf of

Trico Resources Pty Ltd.

Carried out by

Bioscience

Report Type: Application for Works Approval and Licence
Bailup Extractive Industries Project

Prepared by: D.M.Bundock
Project Supervisor: P. Keating

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Document Control

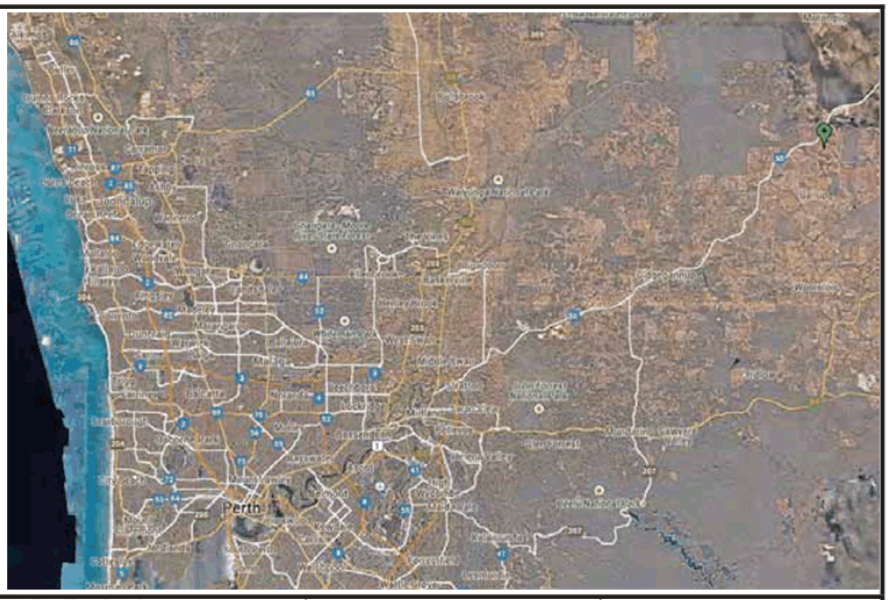
Issue	Date	Author	Reviewer	Approved
1	02/04/2015	D.M. Bundock		

1. Introduction

Trico Resources Pty Ltd, the owners of Lot 7 Toodyay Road (Appendix K) have approval for an Extractive Industries Licence from the Shire of Mundaring. Bioscience was engaged by Trico Resources to undertake an environmental assessment and application for a work approval and licence. This report will provide information requested by the licensing officer at DER (Jessica French) and include recommendations on how to best implement the project whilst minimising environmental impacts on the land.

1.1. Location

The site is located approximately 47km North east of Perth and 56 Km east of the ocean, in the area of Bailup, which is within the Shire of Mundaring. Lot 7 covers an area of approximately 375 Ha, (see site location map - Figure 1 and site plan - Figure 2). It is 13km north east from the town Gidgegannup along the Toodyay Road. The north western boundary is the Toodyay road and it is surrounded by farmland on the three remaining sides.

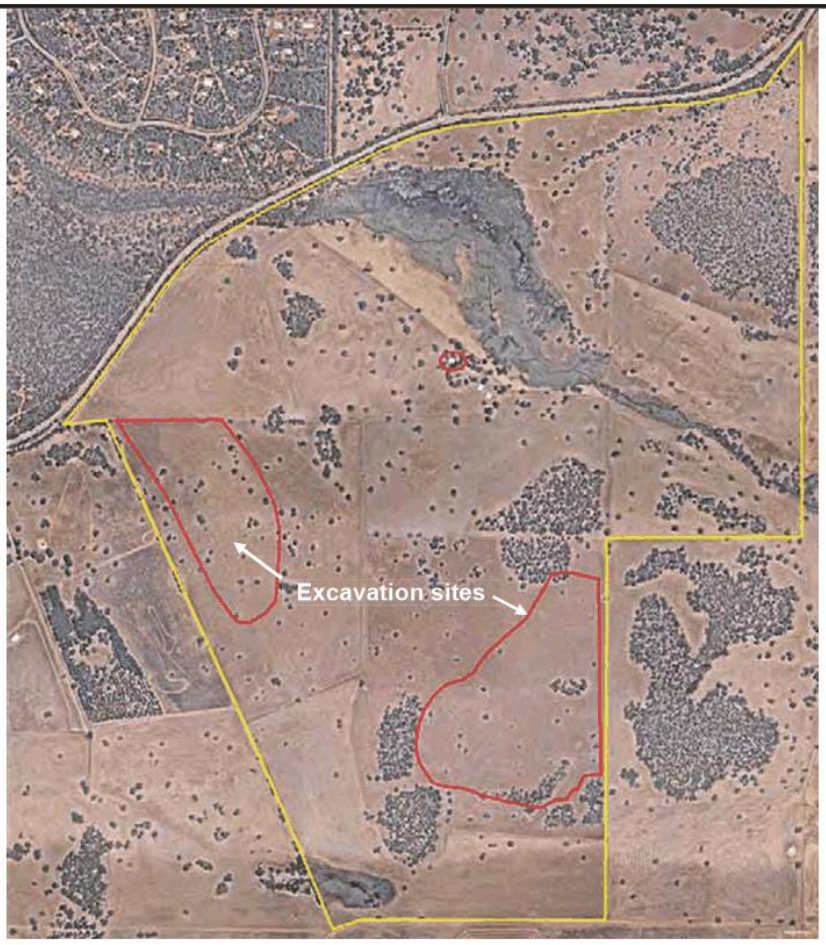


Bioscience	Image accessed from NearMap 29/01/15	Figure 1. Site Location

1.2. Site History

The majority of the property has been historically cleared and farmed extensively over a number of generations, for cropping and grazing, it is currently used exclusively for sheep grazing and hay. Natural vegetation exists in quite large clusters of trees and shrubs on the property, with a number of individual trees scattered over the site.

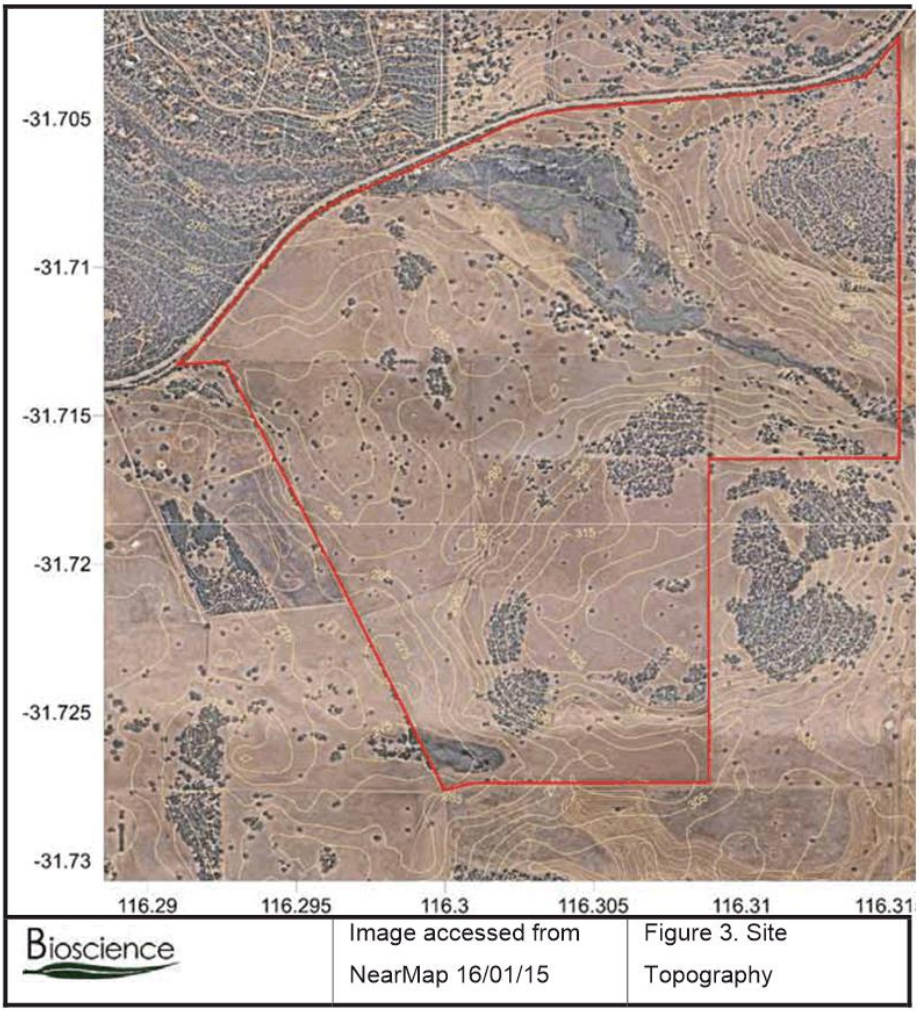
A single dwelling is located in the central north of the property, near to Red Swamp Brook (Fig.2 – Red oval).



Bioscience	Image accessed from NearMap 16/01/15	Figure 2. Site Plan

1.3. Soil and Landform

The site is gently sloping north to the south and east, from approximately 295m to 260m AHD (Fig. 3). The study area is located in the Darling scarp (Churchward.H.M. 1978), comprising of a gently undulating landscape with duricrust (lateritic) on ridges and sands and laterite gravel in shallow depressions, laterite over Mesozoic sediments and Precambrian crystalline rocks and undifferentiated Precambrian crystalline rocks.

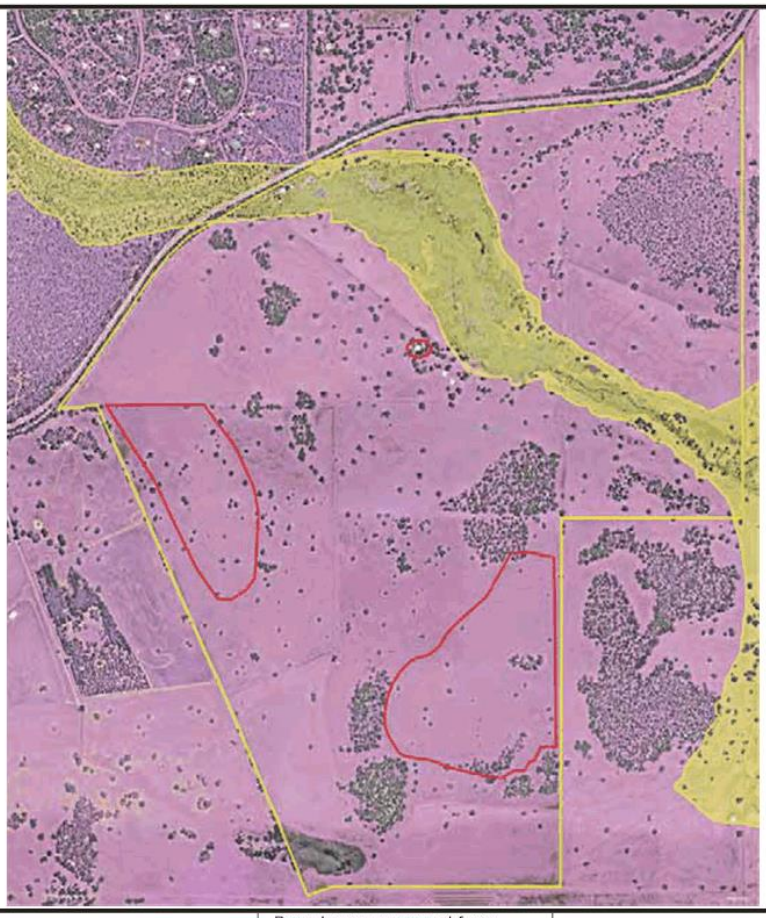


Bioscience	Image accessed from NearMap 16/01/15	Figure 3. Site Topography

1.4 Soils

In order to determine the ability of soils to accommodate rural land uses, the Department of Agriculture developed a land capability assessment methodology (Wells. M.R. 1989).

The Darling Range Rural Land Capability Study (Wells. M.R. 1989) involves a land resource survey and applied land capability assessment methodology to an area of the Darling Range, which included Mundaring shire. There are a total of 28 different land units described, belonging to 9 soil-landform associations, within the shire.



Bioscience

Base Image accessed from NearMap & ASRIS 30/01/15

Pindalup unit
Yalanbee unit

Figure 4. Soils on the property

The property is entirely composed of soils of the Yalanbee and Pindalup units, which are associated with ten soil landscape units that have been mapped within the Darling Ranges.

The majority of the property is made up of the Yalanbee unit (Table 1), an undulating terrain on the Darling Plateau, with predominantly 'buckshot gravel' or 'pea gravel soils' on long, smooth slopes which have gradients ranging from one to eight per cent. It occurs high up in the landscape and is usually separated from the 'Leaver unit' below by a breakaway. Ironstone boulders or lateritic pavement may be present on the surface. This unit forms a major part of the Darling Plateau soil landscape system.

Table 1. Landforms, original vegetation and soils in the Yalanbee unit (DAFWA)

Landform	Dominant	Surface soil	Subsurface soil	Soil type
Undulating upland plateau	Jarrah, marri, parrot bush with wandoo in some areas	Loose to firm, greyish brown sand to loamy sand. Abundant fine, round ironstone gravel. Non-wetting	Coherent, brownish yellow sandy to loamy sand gravel sometimes overlying lateritic caprock	Buckshot gravel
	Marri, wandoo with jarrah in some areas	Hard-setting, greyish brown loamy sand Abundant ironstone gravel	Coherent, yellowish brown sandy loam gravel often increasing to a clay at depth	Yellow sandy gravel over clay
	Marri, jarrah and wandoo with a shrub layer of parrot bush, tea tree	Loose, pale greyish brown sand	About 40–60cm loose, pale sand overlying a gravel layer and/or a massive, yellow loamy sand	Pale sand over gravel/loamy sand
	Banksia, Christmas tree and tea tree with scattered marri	Loose, grey sand	80 cm or greater loose white or pale yellow sand	Pale deep sand
	Banksia, jarrah, marri, tea tree and sheoak	Loose, brown sand	70 cm or greater loose, yellow sand	Yellow deep sand

The Pindalup unit (Pn) is comprised of shallow, minor, swampy valley floors that occur on the Darling Plateau (Table 2). This unit consists of a superficial, narrow valley floor found within the Yalanbee unit (occasionally, 'Leaver' unit). Gradients along the creek line are generally less than one per cent. These valleys have a concave shape with a characteristic swampy floor. The Pindalup unit often occurs upstream from the larger, more dissected Williams valley unit. About 30 per cent of this unit is affected by salinity. The incidence of salinity is highest where there has been clearing.

Table 2 Landforms, original vegetation and soils in the Pindalup unit (DAFWA

Landform	Dominant vegetation	Surface soil	Subsurface soil	Soil type
Shallow concave, thin valley floor found within the DRZ	Flooded gum and rushes White gum grows on the margins of these valleys	Dark grey to dark brown loamy sand to sandy loam	Pale to yellowish sandy loam to sandy clay loam overlying a mottled, light grey to brownish yellow, structured clay. Ironstone gravel may be present	Poorly drained sandy loam duplex
		Hard-setting, brownish, fine loamy sand to loam	Brown to yellow loam often grading into structured clay at depth	Alluvial loam
		Dark greyish brown sand with a loose surface	White to light yellowish brown sand which overlies a mottled, light yellowish brown to pale clay at about 40–70 cm. Ironstone gravel may occur	Dale valley deep sandy duplex

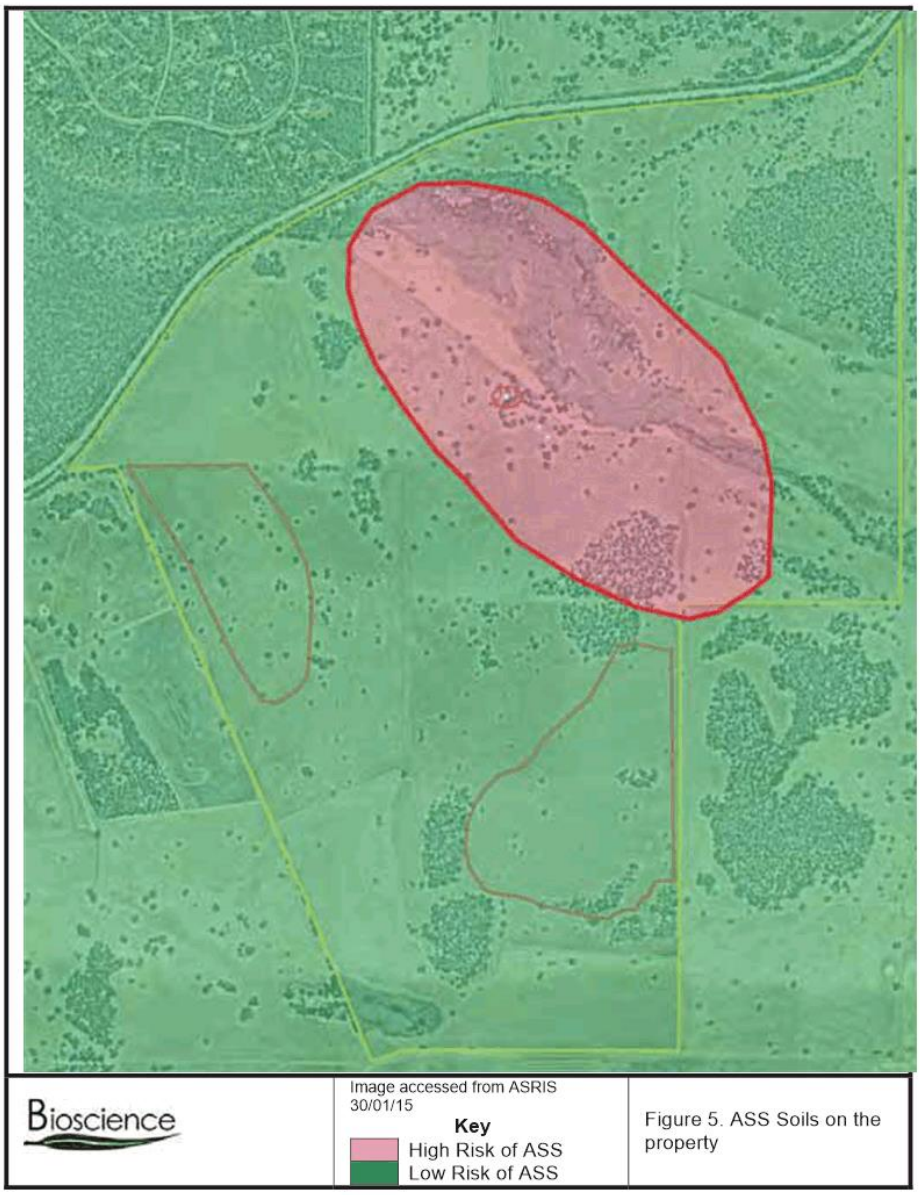
1.5 Acid Sulfate Soils

Acid sulfate soils (ASS) are soils which contain reduced forms of sulfur which typically originate from the reducing conditions associated with anaerobic soils in wetlands. In Western Australia, Acid Sulfate Soils occur in low lying coastal lands such as Holocene swamps and Lakes. If such soils are exposed to oxygen, for example by excavation or dewatering, reduced sulfides convert to sulfuric acid and significantly lower pH, causing a range of undesirable environmental consequences. If they remain undisturbed and inundated, they are stable.

The Department of Environment and Conservation has issued a series of guidance documents to assess the extent to which Acid Sulfate Investigations and the conduct of such assessment, the most recent being "Draft Identification and Investigation of Acid Sulfate Soils" (DER 2013). This document describes the basis upon which risk of ASS is dependent on the geomorphology of the site.

The Western Australian Planning Commission's Planning guidelines for Acid Sulfate Soils (DPI 2008) requires ASS assessment according to the risk of such soils being present. According to the Planning bulletin 64 on Acid Sulfate Soils (DPI 2009), and field observations by Bioscience, the majority of the property is

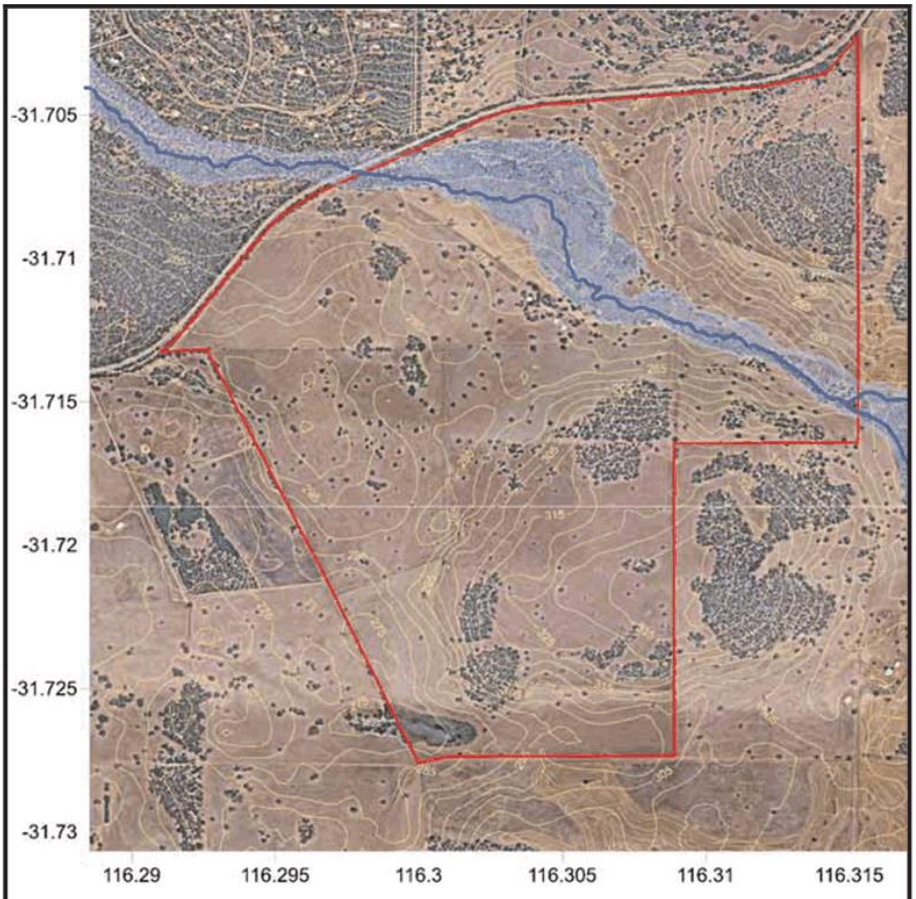
classified as having no known occurrence of Acid Sulphate Soils (ASS). The northern portion of the property, surrounding Red Swamp Brook has a high risk of ASS occurring within 3 m of natural soil surface that could be disturbed by most land development activities (Fig. 5).



1.6 Hydrology

There are no Department of Water monitoring bores, located within the vicinity of the property. The property is outside the area covered by the Perth Groundwater Atlas. Estimation of water table height can be made from the levels of spring fed dams in the vicinity, but this may not be inaccurate

The north of the property contains a wetland and Red Swamp Brook, which is mapped as a tributary for the Swan River. This creek runs diagonally across the property in a north westerly direction (Fig. 6)



Bioscience	Image accessed from Nearmap -Edited in Surfer 30/01/15	Figure 6. Creek and wetlands on the property

1.7 Flora & Fauna

A full vegetation survey usually means following EPA Guidance 51, however initial site investigation indicated that the majority of native vegetation present is parkland cleared, as the land has been grazed for over a century. Using the condition rating system of "Bush Forever" the site generally in either completely degraded or in a very poor condition. Guidance 51 surveys are appropriate for native vegetation in much better condition, and where vegetation units and structure are clearly discernible and comparable to the state's flora database.

An internet search was carried out using NatureMap, to identify any DRF species likely to be found on the site. The results of this desktop study found that within 1km of the site, no DRF or priority species were identified. Within 5km of the site four DRF species and a further seven priority species were noted. Inside a 10km radius this increases to eight DRF and twenty priority species listed (Table 3).

Table 3 – Priority Flora and fauna indicated as being present in the area (NatureMap).

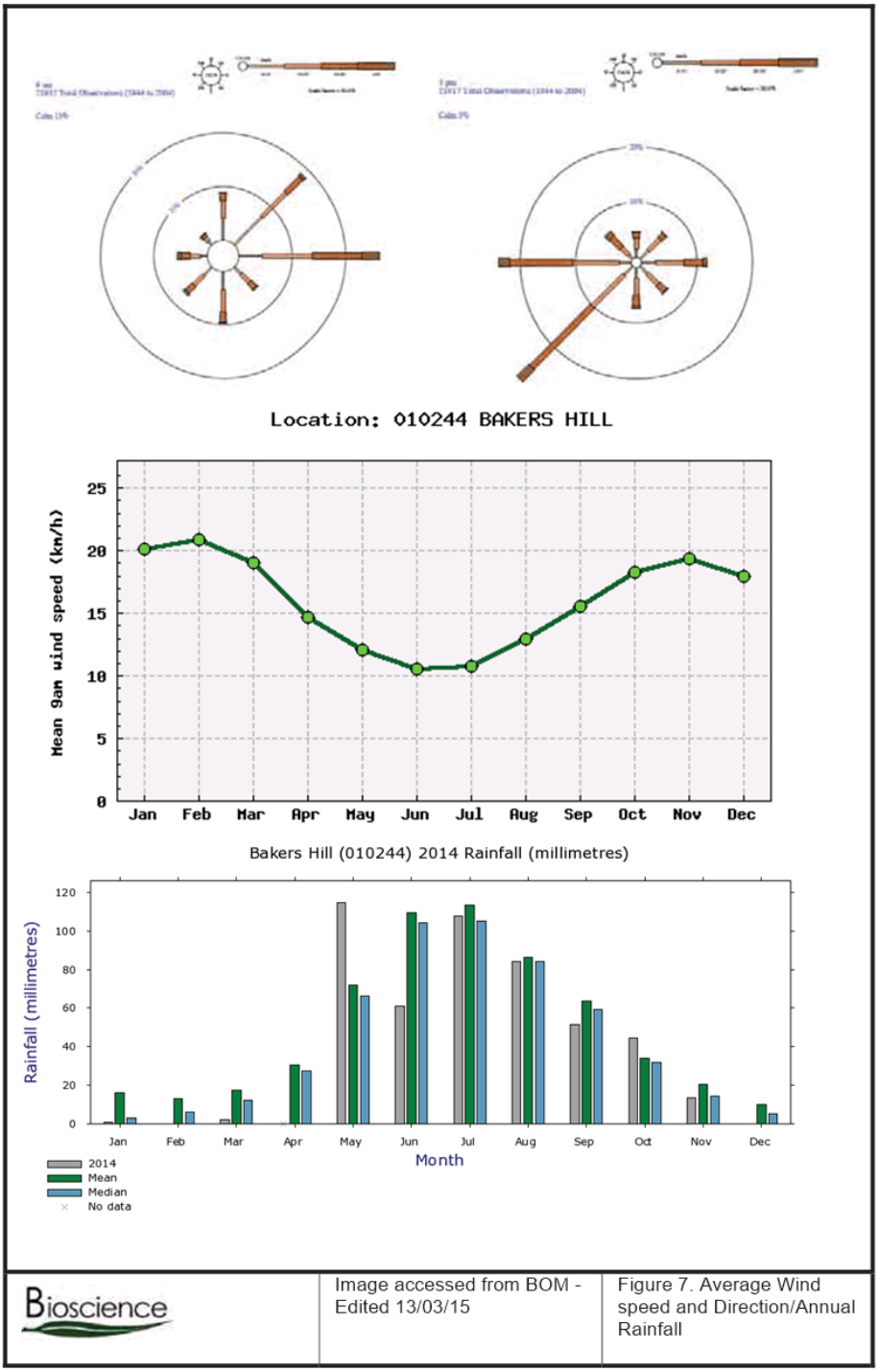
Results of a 5km radius NatureMap search		
Rare or likely to become extinct		
No	**Code**	**Species**
1	24731	*Calyptorhynchus banksii subsp. naso* (Forest Red-tailed Black-Cockatoo).
2	24733	*Calyptorhynchus baudinii* (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo).
3	24734	*Calyptorhynchus latirostris* (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo.)
4	24142	*Petrogale lateralis subsp. lateralis* (Black-flanked Rock-wallaby, Black-footed Rock-wallaby).
Protected under international agreement		
5	24598	*Merops ornatus* (Rainbow Bee-eater).
Other specially protected fauna		
6	25624	*Falco peregrinus* (Peregrine Falcon).
7	25240	*Morelia spilota subsp. imbricata* (Carpet Python.
Priority 2		
8	32205	*Banksia nivea subsp. Morangup* (M. Pieroni 94/2).
9	14710	*Verticordia citrella*.
Priority 4		
10	24133	*Macropus irma* (Western Brush Wallaby).
	Priority 5	
11	24131	*Macropus eugenii subsp. derbianus* (Tammar Wallaby (WA subsp)).

		Results of a 10km NatureMap search Rare or likely to become extinct
1	3220	*Acacia aphylla* (Leafless Rock Wattle).
2	24162	*Bettongia penicillata subsp. ogilbyi* (Woylie, Brush-tailed Bettong).
3	24731	*Calyptorhynchus banksii subsp. naso* (Forest Red-tailed Black-Cockatoo).
4	24733	*Calyptorhynchus baudinii* (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo).
5	24734	*Calyptorhynchus latirostris* (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo).
6	24092	*Dasyurus geoffroii* (Chuditch, Western Quoll).
7	24168	*Macrotis lagotis* (Bilby, Dalgyte).
8	24142	*Petrogale lateralis subsp. lateralis* (Black-flanked Rock-wallaby, Black-footed Rock-wallaby).
		Protected under international agreement
9	24598	*Merops ornatus* (Rainbow Bee-eater).
		Other specially protected fauna
10	25624	*Falco peregrinus* (Peregrine Falcon).
11	25240	*Morelia spilota subsp. imbricata* (Carpet Python).
		Priority 1
12	8912	*Drosera sewelliae* (Red Woolly Sundew).P1
13	6868	*Hemigenia rigida*.
14	19667	Schoenus sp. Toodyay (G.J. Keighery & N. Gibson 2918).
15	8205	*Senecio gilbertii*.
		Priority 2
16	32205	*Banksia nivea subsp. Morangup* (M. Pieroni 94/2).
17	1975	*Grevillea candolleana*.
18	14710	*Verticordia citrella*.
		Priority 3
19	33638	*Meionectes tenuifolia*.
20	4540	*Tetratheca pilifera*.
21	12431	*Verticordia huegelii var. tridens*.
		Priority 4
22	32685	*Banksia arborea (Yilgarn Dryandra)*
23	13826	*Cyanicula ixioides subsp. Ixioides*.
24	14755	*Daviesia oxylobium*.
25	5146	*Hibbertia montana*.
26	5026	*Lasiopetalum cardiophyllum*.
27	24133	*Macropus irma (Western Brush Wallaby)*
		Priority 5
28	24131	*Macropus eugenii subsp. derbianus* (Tammar Wallaby (WA subsp)).

1.8 Climate

Investigating the Bureau of Meteorology website allows comparison of data for wind speed, direction and rainfall (Fig.7).

The information from BOM shows that the annual average for wind direction has a predominantly easterly wind in the morning, switching to westerly or south westerly in the afternoon. These are also the strongest winds on average, although the lower graph highlights the fact that winds are usually stronger in summer than in winter.



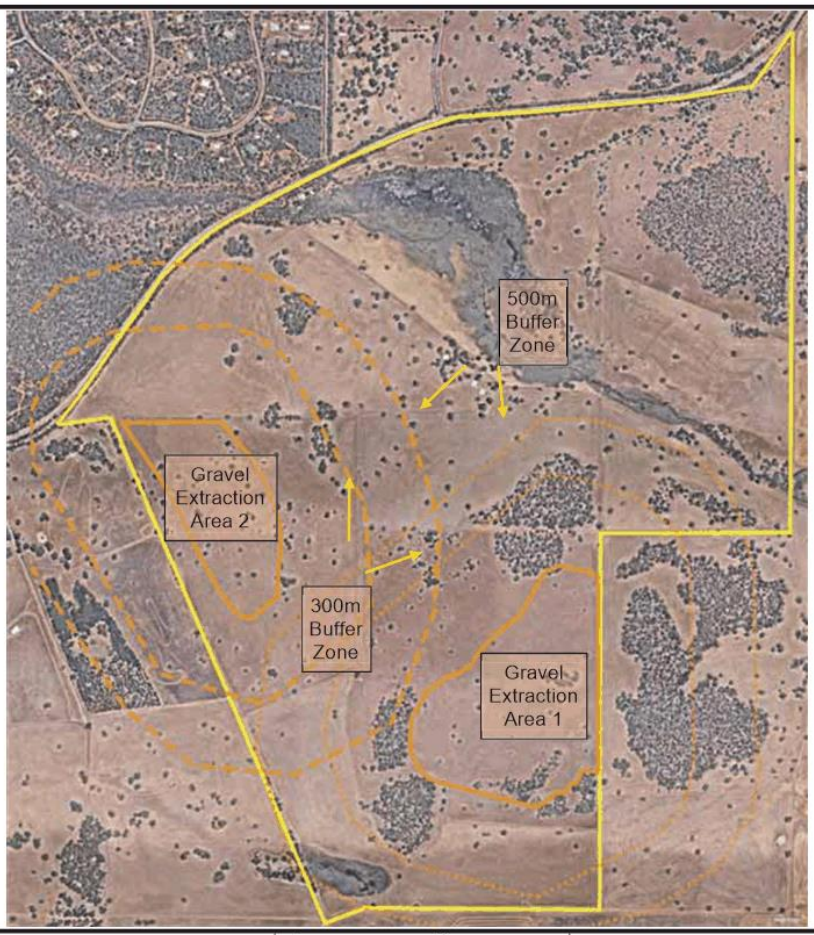
Bioscience	Image accessed from BOM - Edited 13/03/15	Figure 7. Average Wind speed and Direction/Annual Rainfall

11

2 Proposed Gravel Extraction Activity

It is anticipated that the pit will be operated during all or most months of the year, Monday to Saturday from 7am to 5pm.

The size of the proposed gravel pit is approximately 40 hectares, split into two separate areas (Fig.7)



Bioscience	Image accessed from Nearmap -Edited in Surfer 30/01/15	Figure 7 - Proposed gravel mine sites on the property

It is expected that an average of 3-4000 tonnes of gravel will be crushed per day, during peak times (i.e. during the months of spring and summer) with less

production during wetter months. This equates to approximately 950,000 tonnes per year. As this is greater than the *EPA Guide to Works Approval (July 2004)* production or design capacity of 50,000 tonnes of more, it is necessary to apply for a works approval and operating licence from Department of Environment Regulation.

It is anticipated the removal of gravel will be in stages and removal will occur over several years. Prior to gravel removal the topsoil will be scraped off and stockpiled for use in rehabilitation, in addition the positioning of the stockpiles will act as a screen to reduce dust emissions.

3 Impact Assessment, Mitigation & Recommendations

3.1 Clearing of Native Vegetation

Much of the natural vegetation on the site has been historically cleared for farming activities. Vegetation is predominantly retained in large clumps which are not affected by the proposed extractive industry operations. Site preparation will not require clearing of any significant amount of native vegetation.

Any vegetation which is classed as DRF or priority flora which may be impacted by site operation will be fenced off for protection to prevent unnecessary disturbance.

Before any excavation, topsoil will be stripped to the depth necessary to expose the underlying gravel, and stockpiled adjacent the works area for re-use. Much of the proposed gravel pit area has little topsoil present and either has exposed rock or no vegetation evident.

Rehabilitation of the site will include the respreading of in-situ topsoil over the entire works area to promote regrowth of original and native vegetation.

As gravel extraction is to occur over a relatively short period, topsoil will be stripped, stockpiled adjacent to the gravel extraction area and replaced on completion. Where topsoil is not present to any depth of significance, other soils such as clay and loamy soil not exported from the site will be used to form

a rehabilitated surface which will be more suitable for revegetation than current in-situ soils.

As per Section 510 of the Environmental Protection Act (Government of Western Australia 1986) 10 principles dictate the granting or refusal of a clearing permit, and include:

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

The vegetation on the site is highly degraded due to historical grazing. Diversity is very low as few understorey or middle storey plants survive.

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

An initial desktop investigation suggests that a number of priority species may be found in the area. However, the lack of substantial understorey on the site precludes many mammal and bird species from existing there, due to lack of suitable habitat. The three species of Black cockatoo have been seen in the area, but the mammals *Dasyurus geoffroii* (Chuditch, Western Quoll), *Macrotis lagotis* (Bilby, Dalgyte) and *Petrogale lateralis subsp. lateralis* (Black-flanked Rock-wallaby, Black-footed Rock- wallaby) are all highly unlikely to be in the area. A black cockatoo survey has previously been carried out at the site and is included as an appendix to this document (*Appendix A*)

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

No Declared Rare Flora (DRF) where detected during a site visit, most of the native vegetation was lacking in lower and mid storey plants.

4. **Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary or the maintenance of a threatened ecological community.**

A search undertaken on the Department of Environment and Conservation's Threatened Ecological Communities (TEC) Database, revealed that no known occurrences of TEC exists within the property. However, two protected sites

were found in the locality, between 6 and 8 Km away from the property. Both these communities have no association with the vegetation communities present inside the property.

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

Desktop surveys indicate that no significant native remnant vegetation exists on the site.

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

A 500 m buffer will be implemented between the proposed area of extractive and the Wetland on the property, no wetland specific vegetation will be cleared. The environment of the proposed extraction is associated with the wetland through proximity and elevation, but the large buffer should prevent any influence on the creek by the extraction process.

7. **Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

As the proposal is for an extractive industry licence, there will be a requirement to rehabilitate the land at the completion of mining activities; therefore land degradation is extremely unlikely.

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

The nearest conservation area is over 5km away from the site and this should provide a sufficient buffer to prevent any impact on their environmental values.

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

The level of clearance required will be kept to minimum, the effect on surface and underground water sources will therefore be minimal.

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

The small amount of clearing necessary will have very little impact on flooding. In addition the extraction sites are on the upper slopes of the hills and are well removed from the creek, so should have no effect on the incidence of flooding.

3.2 Wetland Protection

Given the location of the Wetland on the property, it is essential that the wetland is protected from any adverse impacts associated with this proposal, and in doing so maintains all its ecological attributes and functions.

It is acknowledged in the Guideline for the Determination of Wetland Buffer Requirements (WAPC(DPI) 2005) that separation distances and management measures are recommended on the basis of potential threats in order to mitigate likely impacts of the surrounding land use. Separation measures are required to mitigate only those threats that are present. Bioscience has assessed the potential threats of this project to be the alteration of groundwater, the reduction in water quality and habitat modification via the invasion of exotic species into the wetlands.

Another threat is habitat modification via the invasion of exotic weed species associated with the upland vegetation being disturbed. This being said, at present the wetland currently is extensively infested with weed species and thus the threat, being already realised, is of marginal concern. There is arguably no need for the default maximum separation distance of 200 m to manage these potential impacts. However, a 500m buffer between the planned extractive industry and the wetland is proposed, to protect the values and attributes of the wetland, whilst taking into account the current surrounding land use and the long term land use for Lot 7.

To minimise any additional or potential damage to the wetland from machinery entering and exiting the property, a fence will be constructed on the easterly side of the access road from the extraction area to the southern boundary. An

existing access track on the western side of the wetland will be utilised by vehicles entering or leaving the property and no vehicles will cross the creek line or into the wetland area.

3.3 Groundwater Pollution and Extraction Depth

The property is located on the Darling ranges, where previous mining operations have shown to have little impact to groundwater quality from pollution and increasing salinity. Due to fuel being stored on site, special consideration will be made to minimise any potential contamination of groundwater. To ensure that groundwater does not become contaminated, fuel is to be stored in approved hydrocarbon storage tanks, and the groundwater and soil within the vicinity of the fuel storage tanks will be monitored for contamination on a quarterly basis. The siting of the site compound and fuel storage facility if required will be well away from the wetland.

3.4 Acid Sulphate Soils

Acid sulfate soils (ASS) are soils which contain reduced forms of sulfur which typically originate from the reducing conditions associated with anaerobic soils in wetlands. In Western Australia, ASS occur in low lying land such as Holocene swamps and Lakes. If such soils are exposed to oxygen, for example by excavation or dewatering, reduced sulfides convert to sulfuric acid and significantly lower pH, causing a range of undesirable environmental consequences. If they remain undisturbed and inundated, they are stable. The majority of the property is classified as having no known risk of ASS occurring within 3m of natural surface (or deeper) that could be disturbed by most land development activities, whereas the northern portion has a high to moderate risk of ASS occurring within 3 m of natural soil surface that could be disturbed by most land development activities (Fig.5). There is no intention to extract from these areas, gravel will be extracted only from areas, where no ASS risks occur. Should any soils be encountered during mining which are dark coloured, samples will be analysed to confirm low risk of ASS by testing for:

1. Field pH testing
2. Total sulfur and carbon
3. Redox potential

3.5 Rehabilitation and Long Term Landuse

To ensure that the site is rehabilitated back to a near original condition, topsoil will be removed and stored onsite until the completion of each stage, where it will then be redistributed to near the original soil profile, over the extracted area and rehabilitated back to usable pasture.

4 EPA Criteria

4.1 Environmental Protection Act 1986 PART IV

The project has not been referred or assessed by OEPA.

4.2 Rights to Water Irrigation ACT 1914

The site does not have a groundwater license number or groundwater allocation/ aquifer for groundwater use.

4.3 Local Government Authority

Planning approval for extractive industry has been granted by WAPC and LGA (Appendices I & J). The planning application nominated an annual throughput of 49,000tpa. Planning conditions do not specify throughput. This application for an Operating Licence has nominated a maximum throughput of up to 950,000tpa, to provide flexibility during the life of the gravel pit. Impact and mitigation strategies for emissions have been assessed based on this quantity.

4.4 Stakeholder and Community Consultation

Stakeholder or community objections have already been canvased for the approval by the Shire of Mundaring.

4.5 Emissions/Discharges from Site

4.5.1 Airborne Emissions -Dust

Source/ discharge points – Gravel extraction facility, processing area, roadways.

Composition and quantity – Dust from extraction, processing, loading and road dust.

Variability of emissions – Infrequent.

Treatment method - The maintenance of suitable moisture levels on roadways and the matching of specific operations to the prevailing weather conditions. The movement of material is carried out in an isolated area prior to loading onto trucks. Wind breaks are provided by the surrounding hills. The company will adhere to the rural business licence, if they are forewarned of high wind days by the shire, operations will cease. Trucks and dog tailers will be covered with tarpaulin when carting gravel.

Soil stockpiles, un-stabilised surfaces and traffic thoroughfares (including internal roads used by trucks) will be suppressed with water applied by water-carts. Water is available from a local soak and adjacent dam in the south- west corner of the property. The quantity of water used will be dependent on the prevailing weather conditions, Wind speed, direction, location will determine site specific decisions for where water needs to be applied.

Monitoring technology employed – Visual monitoring.

Contingency plans – Addition of water to dampen down the dust, using a water truck this will have the ability to dampen slopes as well as roadways.

Identify Sensitive Environmental Receptors or pathway – *(See Table 4)*

Comparison of fugitive emissions with relevant ambient standards –requires modelling – As the facility is in a rural zone, the measurement of dust produced is problematic and is not covered by the protection measures.

Consider cumulative impacts of multiple emissions – N/A.

Derivation of targets and limits – WA has adopted the NEPM (National Environment Protection Measures standards for airborn pollutants which gives values of 50µg/m^3 for PM10 particles and 25µg/m^3 for PM2.5 particles.

How the risk is determined – Risk is determined by the absence or presence of complaints about particulate matter emissions shown to be caused by the facility. Emissions comply with the requirements specified in the Clean Air (Plant and Equipment Regulation 1997).

Why the risk is measured in this way – As dust production will be variable throughout the working week, it would not be feasible to continually monitor

levels. Dust management will be considered on a day-to-day basis, as rainfall, wind direction and wind speed vary daily. During the drier seasons water suppression of dust will be reduced whilst windy periods will increase the distance that dust will travel, in contrast wet weather will generate natural dust suppression.

General Procedure for Dust Suppression

Material exported off the site (gravel) will be carried in truck bodies of various size and configuration – generally open-top, tipping trailers. During transport, dust can be lifted out of these open trailers and cause nuisance and other problems along the travel route from the site to delivery destination. Crushing, screening and stockpiling gravel will be undertaken by fixed temporary plant and can cause dust pollution when soils are elevated and moved. Thoughtful location of the processing plant can greatly reduce wind-influence.

The processing plant will be placed in a location having the greatest wind protection, within close proximity to the extraction area. It will be located at lower ground levels vegetation will be used to screen it where possible.

The site supervisor will have the authority and responsibility to suspend gravel processing should wind adversely impact the production of dust.

The entrance for the site was proposed as the existing access onto Toodyay Road. This location has been accepted by MRWA with condition that an upgrade is carried out on the intersection. In addition the adjacent portion of the internal gravel road will be sealed with a bitumen and aggregate, for 70 meters, to encourage the removal of dust from vehicle wheels before entering Toodyay Road.

The primary method of dust control is the application of water over exposed surfaces, which requires a suitable water source.

Water is proposed to be taken from a dam located in the south-west corner of the site as detailed in the EIL Application 20-Oct-09. This has been agreed as being the most suitable, safe and least environmentally sensitive source.

The dam is located on the eastern side of an isolated low-lying area where approximately 2.5 hectares is either waterlogged or has water ponding on the surface (often termed a 'soak'). Adjacent elevated landforms with dense surface and underlying soils direct stormwater to this low-point. There are several trees located on the boundary of the site in this area and further west is a small group of trees. The surrounding land is used for cropping and grazing. There are no near-by areas of significant vegetation or bushland susceptible to significant fluctuations in surface water. This wet area is separated from Red Swamp Brook, it does not form any type of creek or river system. A hydrological survey has been carried out (Appendix D) which indicates the recharge as being an estimated 45,000kL annually.

The Department of Water has been consulted regarding taking of water and concur with the above conclusions. They have not placed any conditions on the development and have confirmed that there is no requirement for a licence, as water is being taken from an existing dam/soak which is not creek or bore fed.

An estimate for the maximum volume of water required from the dam for dust suppression is:

Maximum no. of loads per day	9
Volume of water cart:	10 kL
Average no. of dry days annually (BOM):	299
Estimated average daily use:	90 kL
Estimate maximum annual use:	26,910 kL

These volumes are an estimated maximum consumption, however other factors will reduce the requirement to take water, such as prevailing weather and production rate.

Table 4. List of all known Sensitive Environmental Receptors in the locality of the site.

Name of Receptor	Distance from site	Direction from Site
445 Squarcini Close (Neighbour)	0.2	W
3650 Toodyay Rd (Neighbour)	0.84	E
135, Red Brook Circle (Neighbour)	1.01	N
151, Red Brook Circle (Neighbour)	1.06	N
153 Red Brook Circle (Neighbour)	1.08	N
177 Red Brook Circle (Neighbour)	1.13	N
3456 Toodyay Rd (Neighbour)	1.41	W
3427 Toodyay Rd (Neighbour)	1.82	W
9400 Bailup Rd (Neighbour)	1.94	SW
40, Utah Rd. Gidgegannup (Neighbour)	2.05	W
Wundowie Primary School	8.68	SE
Wooroloo Primary School	9.45	S
Gidgegannup Primary School	13.4	SW
Chidlow Primary School	16.2	SSW
Mount Helena Primary School	20.1	SSW
Eastern Hills Senior High School	21.1	SW
Bullsbrook College	21.5	NW
Swan View Senior High School	23.1	SW
Parkerville Primary School	23.1	SW
Mundaring Primary School	25.1	SW
Midland Hospital	33.1	SW
Toodyay District High School	34.8	NE
Northam hospital	35.3	ENE
Northam District High School	41.8	ENE
Northam High School	42.1	ENE

4.5.2 Noise Emissions

Source/ discharge points – Noise can be emitted from machinery used in extraction or crushing processes and trucks collecting finished product (Table 5). A noise impact assessment has been carried out by Herring Storer Acoustics *(Appendix B)* which found that the noise levels were likely to comply with the Environmental Protection (Noise) regulations (Department of Environment and Heritage Protection 1994), for the operating times of the site.

Table 5. Composition and quantity of Noise production- Vehicle movements per week:

Type of Plant	Use	Size/ Rating	Max. Power/ operation noise	Location
Transport Truck (Multiple)	Haulage of Gravel off-site	41 tonnes	410kW/ 110dB	stockpile and off-site, frequent use
Small Excavator	Bulk handling	37.5 tonne	200kW/105dB(A)	Mobile, frequent use
Crusher	Crushing gravel	70.5 Tonnes 750 tonnes per hour	225kW/110dB	Mobile, frequent use
Screening Plant	Screening gravel	35 tonnes, track mounted	72kW/110dB	Mobile, frequent use
Dozer	Ripping and excavation of gravel	70.2 tonnes	447kW/115dB(A)	Mobile, infrequent use
Water Cart	Dust Control	60 tonnes	365kW/105dB	Mobile, infrequent use
Loader (x2)	Bulk handling, loading	50.144tonnes 5 - 7.5 m^3	373kW/108dB(A)	Mobile, frequent use
Quarry Truck	Bulk handling gravel from point of excavation to the processing plant	34.5 Tonnes	365kW/ 79-110dB(A)	Mobile, frequent use

Variability of emissions – Frequent noise throughout the work day.

Treatment method - Operations will start at 7am and continue through to 5pm. Noise will be kept to minimum, by maintaining roads and machinery to reduce road noise. The position of the extraction site will afford a great deal of noise protection, due to vegetation and natural contours. Crushing and screening operations will be in designated areas close to the extraction points, to provide noise protection to receptors. All static equipment will be provided with sound dampening and mufflers.

Monitoring technology employed – Acoustic modelling of noise emissions has been carried out *(Appendix B).* The results indicate that work at the site will not produce noise above approved levels.

Contingency plans – Ensure that all roadways are well graded to reduce suspension compression noise, ensure that loads are timed to arrive/depart during the working day.

Identify Sensitive Environmental Receptors or pathway – (See Table 4)

Comparison of fugitive emissions with relevant ambient standards - Monitoring of noise levels can be carried out on a regular basis, if required, to ensure that there is no exceedance of permitted noise levels.

Consider cumulative impacts of multiple emissions – Cumulative emissions would indicate an issue with the roads or vehicles. This would trigger the complaints procedure (Section 6), to correct the problem.

Derivation of targets and limits - The work carried out at the facility is covered under class 1 of the DER Guide to management of Noise. The work will be carried out during the work day, and as long as every care is taken to ensure that the work cannot be carried out more quietly, the requirements of the act will be fulfilled. In addition a Noise impact assessment has been completed by Herring Storer Acoustics (*Appendix B*)

*How the risk is determined - T*he absence of verified complaints indicates a well-managed facility and equipment.

Why the risk is measured in this way - There is no requirement to produce a noise management plan as the work is being carried out during the normal work day. Modelling carried out by Herring Storer provides additional evidence of compliance with environmental regulations...

4.5.3 Air Emissions - Odours -Individual compounds

Source/ discharge points – Machinery.

Composition and quantity – Exhaust gases, diesel smell from machinery.

Variability of emissions – Infrequent emissions of all gases other than CO_2, which is most likely to be released constantly by vehicles.

Treatment method – Maintenance of vehicles to be carried out regularly, to ensure efficiency and lower emissions.

Monitoring technology employed – Daily visual checks, weekly monitoring and scheduled maintenance.

Contingency plans – If unusual amounts of gas odours are detected the machinery will be checked and maintenance carried out.

Sensitive Environmental Receptors – (See Table 4)

*How the risk is determined. – T*he absence of verified complaints indicates a well-managed facility and equipment.

Consider cumulative impacts of multiple emissions - After a complaint has been received, the operator will:

- Record complaints.
- Investigate the source of the odour
- Take immediate action to reduce the odour impact to agreed levels
- Contact the complainant about the action taken in response to the complaint
- Record complaints and responses or actions, make this readily accessible to the community and regulatory authorities
- Enable a system for providing feedback to the community.

Comparison of fugitive emissions with relevant ambient standards. The chemical emissions have ambient standards with which current levels can be compared. However comparison requires a detailed study to be carried out.

Derivation of targets and limits - Targets and limits are derived from information contained in *Approved Methods for the modelling and assessment of Air pollutants in NSW*

Why the risk is measured in this way. In most cases the gases are detected by olfactory senses at much lower levels than the standards.

4.5.4 Light emissions

Source/ discharge points - Building and vehicle lights.

Composition and quantity - Variable, but not usually applicable as work is carried out in the normal working day.

Variability of emissions – Infrequently, as business usually closes down by nightfall.

Treatment method – Limit work after nightfall.

Monitoring technology employed – No monitoring carried out but complaints from neighbours will be confirmed and dealt with.

Contingency plans – Baffling of light and stricter control over working hours

Identify Sensitive Environmental Receptors or pathway- (See Table I)

Comparison of fugitive emissions with relevant ambient standards – As work is carried out during the normal work, this will not be formally monitored, however any complaints from neighbours will be dealt with as soon as feasible.

Consider cumulative impacts of multiple emissions – Cumulative impacts of multiple emissions should not be an issue due to the working hours.

4.5.5 Discharge to water

Source/ discharge points – Fuel storage areas, vehicles, Water runoff.

Composition and quantity – Diesel, lubricant oil, water runoff.

Variability of emissions – No discharge is planned, but unforseen leakage may occur.

Treatment method - The foremost measure to reduce leakage is care taken in refuelling machinery. However bunding around the fuel storage area will reduce the chances of fugitive emissions. If water runoff proves to be an issue then temporary bunding or dams can be installed to remedy the problem.

Monitoring technology employed - The appropriate methods following Australian standards (AS/NZS 5667.1/6/10; (Standards Australia 1998a/c/d) and Australian guidelines for water quality monitoring and reporting (ANZECC 2000) will be used for sampling and analysing surface water bodies, groundwater and leachate.

Contingency plans – If accidental discharge occurs remedial action will need to be carried out, to prevent further discharge and ensure that a similar situation will not occur in the future. A water pollution remediation plan will be prepared and include the following information:

- Immediate measures to contain any contamination;

- Why the pollution occurred
- The process to be used to protect water from further pollution
- Assessment of practicable ways of returning the water to the original quality
- Immediate measure to prevent further contamination;
- Remediation measures;
- Changes to site activity to prevent re-occurrence;
- Monthly inspection to ensure that no contamination has occurred.

Identify *Sensitive Environmental Receptors* or pathway - Due to the proximity of Red Swamp brook, it is essential that all reasonable care be taken to prevent contamination of this environmentally sensitive area.

Comparison of fugitive emissions with relevant ambient standards –requires modelling. – Regular testing of surface water can be carried out to ensure that no leachate is escaping into the system. Results will be compiled and any differences in chemical composition will be easily identified.

Consider cumulative impacts of multiple emissions – The aim is to produce zero emissions, if multiple emissions do occur, it will require a major re-planning of the fuel storage bunding systems and extraction site.

Derivation of targets and limits – Targets will be derived from values collected prior to commencement of operations from water bodies on the site. This will set the base line for leachate, any measurements recorded above these will trigger a review to the system.

How the risk is determined – The risk is determined by comparison of chemicals recorded in ambient levels in water bodies prior to commencement of extraction, with levels of the same chemicals found during operations.

Why the risk is measured in this way – The risk is measured in this way as base line levels will be set and these can be compared with results collected during and after operations, this enables a very precise testing procedure.

4.5.6 Discharge to Land

Source/ discharge points - Fuel storage and refuelling of vehicles.
Composition and quantity- Diesel and lubricant oils.
Variability of emissions – Fugitive emissions may be produced infrequently during operation.

Treatment method – Bunding around the fuel storage area will reduce the chances of discharge to land.

Monitoring technology employed – Visual monitoring and early reporting of and y fugitive emissions.

Contingency plans - Under the Environmental Protection Act (1986), if pollution incidents causing or threatening material harm to the environment are detected, then the facility occupier will take immediate action to contain the pollution. The incident will be reported to the appropriate regulatory authority in accordance with the Act, giving details such as the nature and source of the pollution, any actions taken, and any future action that will be carried out to prevent recurrence. If the EPA directs the future actions, these will be commenced as soon as practicable.

If the water assessment report indicates that action is required to mitigate the pollution and remediate the water, then a water pollution remediation plan will be prepared and include the following information:

- Why the pollution occurred
- The process to be used to protect water from further pollution
- Assessment of practicable ways of returning the water to the original quality
- Documented procedures for identification and remediation of contaminated sediments.

Identify Sensitive Environmental Receptors or pathway - Due to the proximity of Red Swamp brook, it is essential that all reasonable care be taken to prevent contamination of this environmentally sensitive area.

4.5.7 Hydrocarbon/ Chemical storage

Volumes and type of hydrocarbons and chemicals stored on the property –

There will only be one fuel type stored on site:

Diesel – 5,000 litres

Storage location – Storage consists of approved tanks compliant with the Dangerous Goods (Storage and Handling of Non-explosives) Safety Regulations 2007 and Australian Standard 1940.2004.

Secondary containment of environmentally hazardous substances – The tanks are to be mounted on a concrete pad. The tank will be double skinned to provide emergency storage in case of leakage.

Construction / Infrastructure requirements for management of potential discharges and emissions. – A regularly maintained, standard Hydrocarbon spill kit will be mounted next to the fuel tank, for immediate deployment should a spillage occur

What is the environmental risk of the discharge? -The environmental risk of discharge will be very low.

How is the risk determined and why is it measured in this way. The risk is determined by the possibility of tanks rupturing or leaking and the bunding wall failing to contain the fuels.

4.5.8 Native Flora/Fauna

Area to be cleared - There are limited number of areas proposed for clearance of native vegetation.

Neighbouring or other local vegetation areas – The site is mainly cleared except for clumps of remnant vegetation the vegetation type varies, but usually consists of Jarrah, Marri and Parrot bush, with Powderbark Wandoo and other species present in some areas. Remnant vegetation in the Pindalup unit usually consist of Flooded Gum, White Gum and Rushes. A Naturemap survey has been carried out for the area, to identify possible priority species (Appendix C).

Flora/fauna – The desktop flora and fauna carried out, indicates that no priority species are found in the areas concerned. In addition a black cockatoo study has been carried out to identify any habitat or forage trees on the site (Appendix A)

Sustainability – The areas cleared will be small enough to have very little impact on the sustainability of the local flora and fauna.

4.5.9 Contaminated Site Identification

No contaminated sites have been identified at the property and it is intended that the extraction process does not contaminate the environment.

4.5.10 Industry Guidelines

The following guidelines were the ones used mainly for planning the proposal:

- Government of WA – Department of Water (2013) Water Quality protection note 15 – Extractive Industries near sensitive water resources (Department of Water 2011).

- CC&A (2010) Extractive industries Model Codes v1.0 and guidelines for the extractive industry model codes v1.0. Queensland (Department of State Planning 2015).
- EPA Victoria (2007) Protocol for environmental management –mining and extractive industries. EPA Victoria (EPA Victoria 2007).
- WA Planning Commission (2000) Basic Raw Materials Applicants' Manual. Perth (WAPC(DPI) 2000).

Further Industry guidelines are identified in the reference section.

Compare proposal against each element of guideline – Industry guidelines have been used to establish best practice procedures for all stages of the composting process.

4.5.11 Pest, Weed and Vermin Control

Weed control will be carried out as necessary, but the surrounding area is pasture land and will already be weed strewn.

Pest/vermin controls will involve the binning and removal of any foodstuffs and rubbish on the site on an 'as-needs' basis, to reduce the risk of vermin.

4.5.12 Site Security

The security of the processing site is considered to be adequate, due to the property's distance from the town and the presence of a dwelling on the site. Further fencing and signage will not be required, other than those specified in the shire planning approval.

4.5.13 Maintenance of Facilities and Equipment

All equipment is regularly maintained to ensure safe and effective operation at the composting site. Regular site inspections will identify problems on the site and maintenance can be carried out effectively.

5. Fire-fighting and Prevention

5.1 Fire Prevention

Fire prevention measures are carried out by:

- Prohibition of smoking on site
- Assessment and minimisation of the risk of spark generation from operating equipment.
- Reticulation of firefighting water at suitable flows and pressure, from a supply of suitable capacity.
- Prevention of unlawful entry to the site.

5.2 Fire-Fighting Provisions

Staff members will undergo site induction which will include fire risk and emergency procedures.

Machinery will be fitted with fire suppression equipment.

5.3 Staffing

Staffing will include:

Site manager – (full time)

3-5 x Machinery operators (full time)

Staff training procedures will include an induction where all staff will undergo training in safety, risk reduction, noise reduction, dust reduction, emergency procedures and general housekeeping procedures.

6. Complaints Procedure

Complaints from approved extractive industry generally apply to the escape of noise and dust pollution. Odour pollution is not a product of mining gravel.

Complaints made to the operator/licensee will be documented and dealt with expeditiously. Complaints received either directly from the complainant or via the Shire of Mundaring will be reviewed by the operator and interested parties to assess:

- The legitimacy of the complaint;
- The aspects of the operation that triggered the complaint;
- Management actions required to address the issues raised, to bring operations into line with conditions imposed under the Extractive Industries Licence.

Actions considered necessary to comply with relevant legislation, regulation and licence conditions will be undertaken immediately. If necessary, works will be suspended until appropriate rectification has occurred.

Summaries of complaints and action taken to address each specific issue will be recorded in a Complaint Report. The Complaint Report will document the following:

- Details of site, location, licensee and operator;
- Time and date of complaint;
- Details of complainant (including how complaint was made);
- Details of complaint;
- Licence condition(s) allegedly breached;
- Resolution:
- Name of person investigating on behalf of operator/licensee;
- Details of weather conditions at time of complaint;
- Details of site activity at time of complaint;
- Comment as to complaint and cause;
- Time and nature of Immediate action taken;
- Time and nature of Follow-up action taken (if any);

- Date and time complaint was resolved;
- Recommended changes to operating procedures to prevent complaint recurrence;

Complainants and the Shire of Mundaring will be advised of complaint handling and resolution process, including receipt of copy of Complaint Report.

7. Conclusions and Recommendations

Shire and WAPC planning approval for this project has already been gained for this project (Appendices I &J). This report presents environmental information about the proposed project and how it fulfils the environmental conditions.

Clearing permits for vegetation removal should not be needed, as the amount of clearing is kept to a minimum, in order to reduce potential environmental impacts.

The Red Swamp Brook area on the site will be monitored for any changes, over the course of the project and to alleviate any issues, all site infrastructure will be located as far as possible away from the wetland. The maintenance of a vehicle and heavy equipment buffer around the wetland will help to prevent damage and the spread of weeds into the wetland. Monitoring of surface water on the property will enable the monitoring of water levels and water quality on a regular basis. In order to prevent contamination of groundwater, only approved hydrocarbon storage tanks will be installed on the site.

The construction of roads on the property is unnecessary as there are already suitable tracks, however the construction of a suitable bitumised access point, is needed to reduce dust and mud on the Toodyay road. To prevent disturbance to nearby residence, works should not to commence before 7am and be completed by 5pm, Monday to Saturday only.

Soil will only be extracted from areas with groundwater depth greater that 2m AHD, where no ASS risks occur. If any soils are uncovered, which are a different colour from normal, these will be tested. Topsoil which is removed from above the gravel will be stored on site and used as further sound barriers, it will be

replaced at the completion of each stage. Vegetation will be rehabilitated back to pasture as soon as possible, ideally at the completion of each stage.

8. References

Churchward.H.M., M. W. M. (1978). Landforms and Soils of the Darling System, Western Australia. Atlas of Natural Resources. Darling System. Western Australia, Perth WA, Department of Conservation and Environment.

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DER (2013). Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes. Contaminated Sites Branch. DER. Perth WA, Governement of Western Austrlia.

DPI (2008). Acid Sulfate Soils -Planning Guidelines. Department of Planning and Infrastructure. Perth WA, Government of Westren Australia.

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Government of Western Australia (1986). Environmental Protection Act. SLP. Perth WA, Government of Western Australia.

WAPC(DPI) (2000). Basic Raw Materials Applicants' Manual. W. A. P. Commission. Perth WA, Government of Western Australia.

WAPC(DPI) (2005). Guidelines for Determination of Wetland Buffer Requirements. Western Australian Planning Commission (Department of Planning and Infrastructure). Perth WA, Government of Western Australia.

Wells. M.R., K. P. D. (1989). Land capability assessment methodology. W. A. D. o. Agriculture. Perth WA. Resource Series No. 1.

FIGURE A1 – SITE LAYOUT

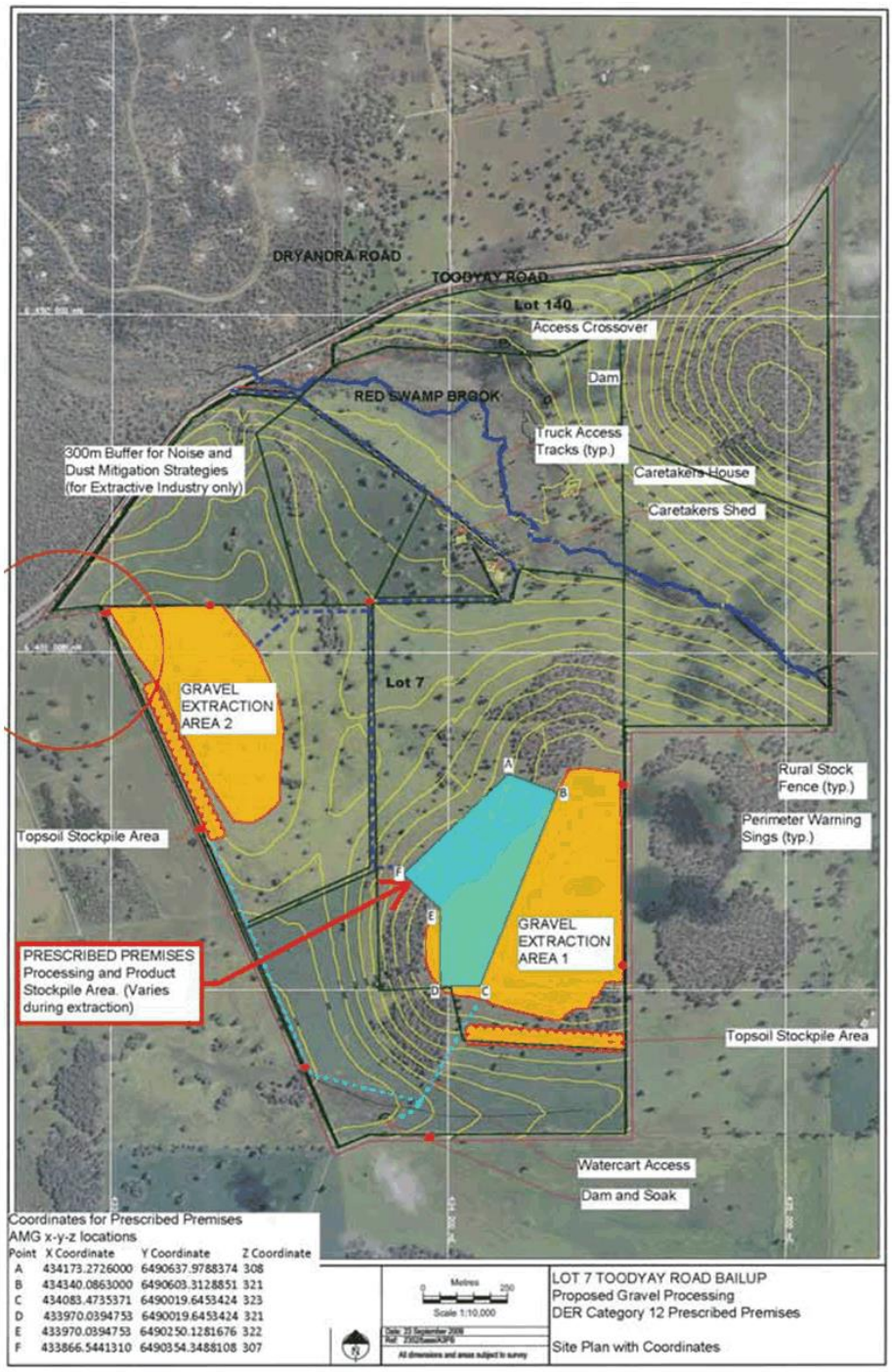

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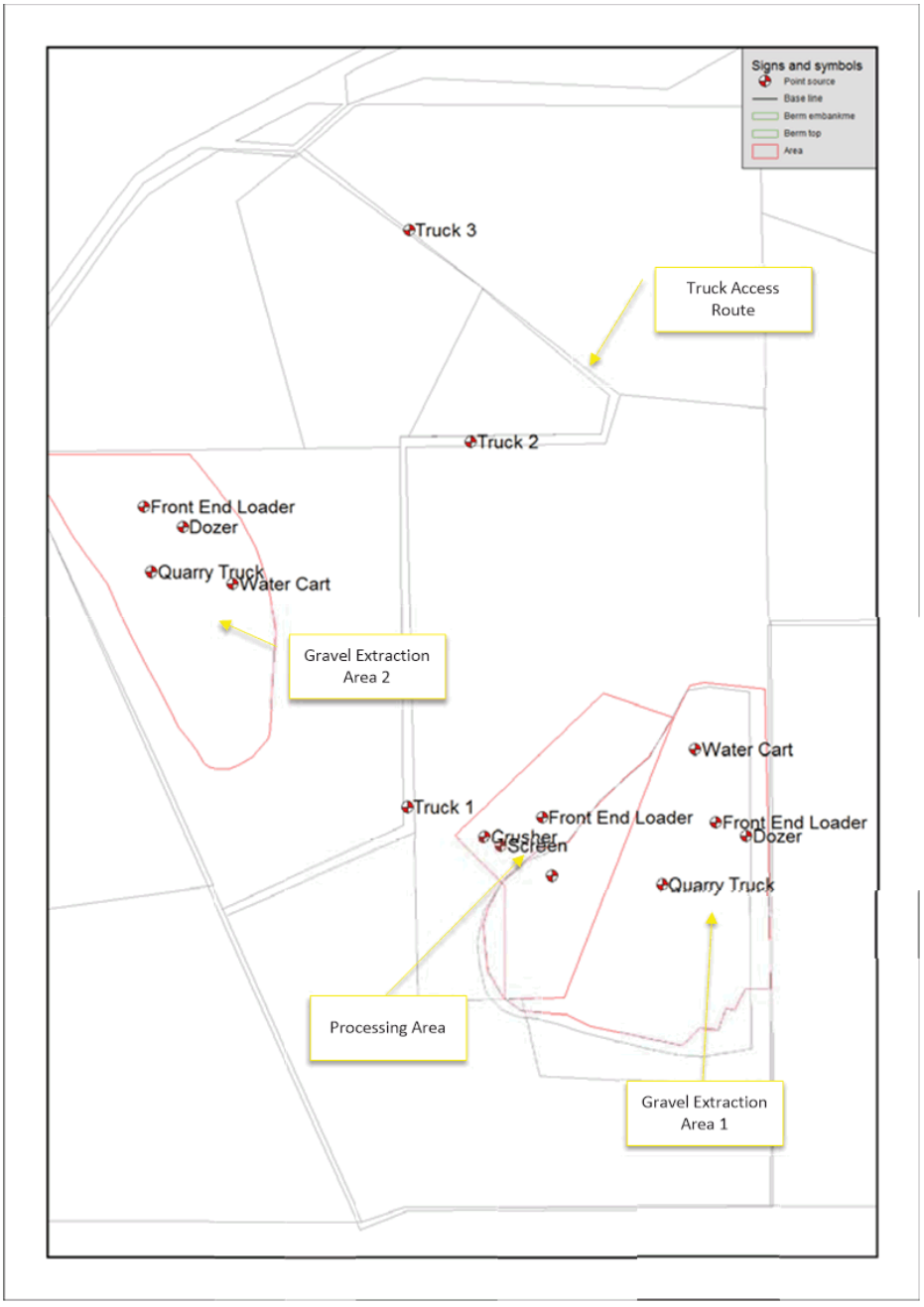
FIGURE A2 – RECEIVER LOCATION



Noise Contours

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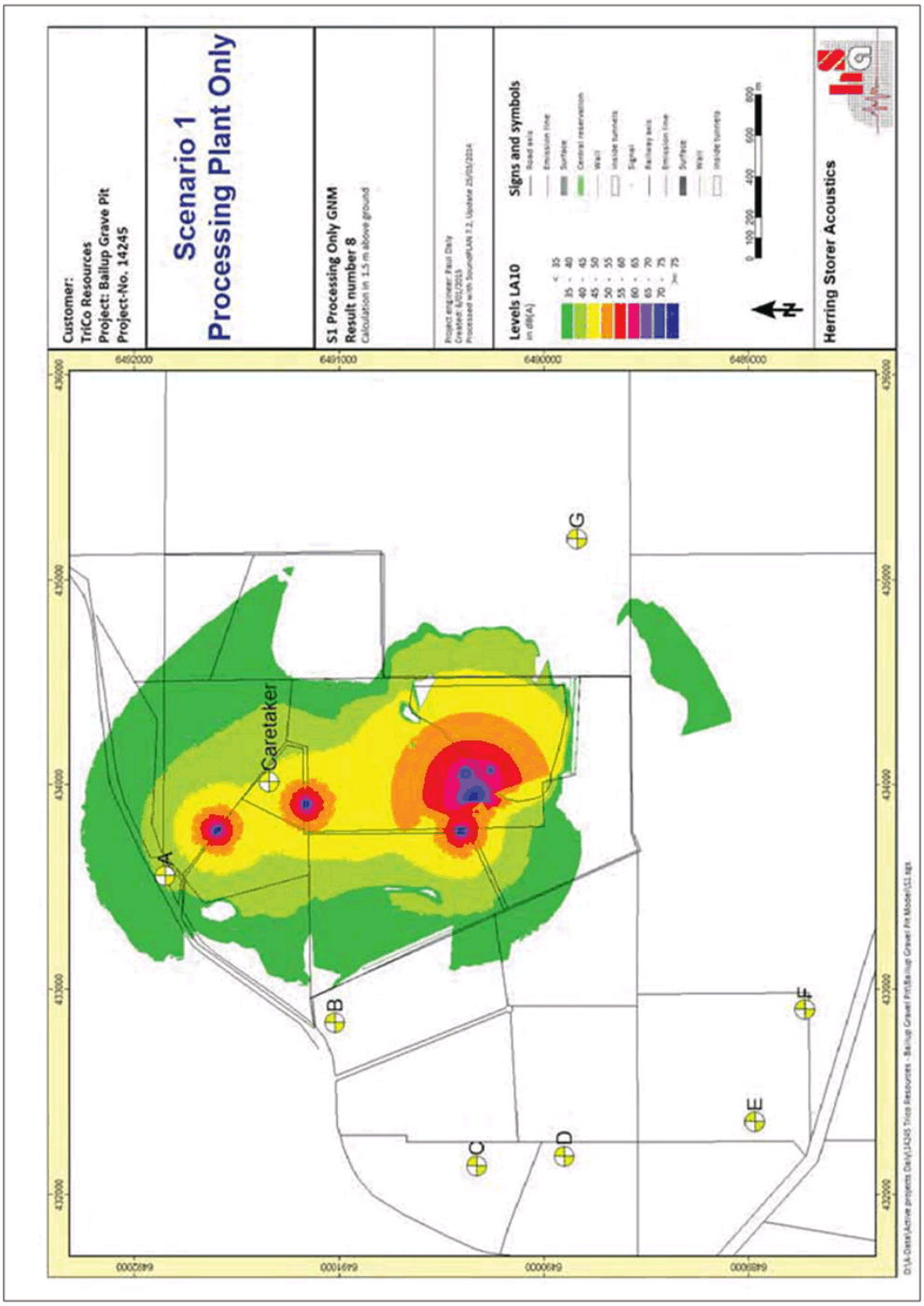

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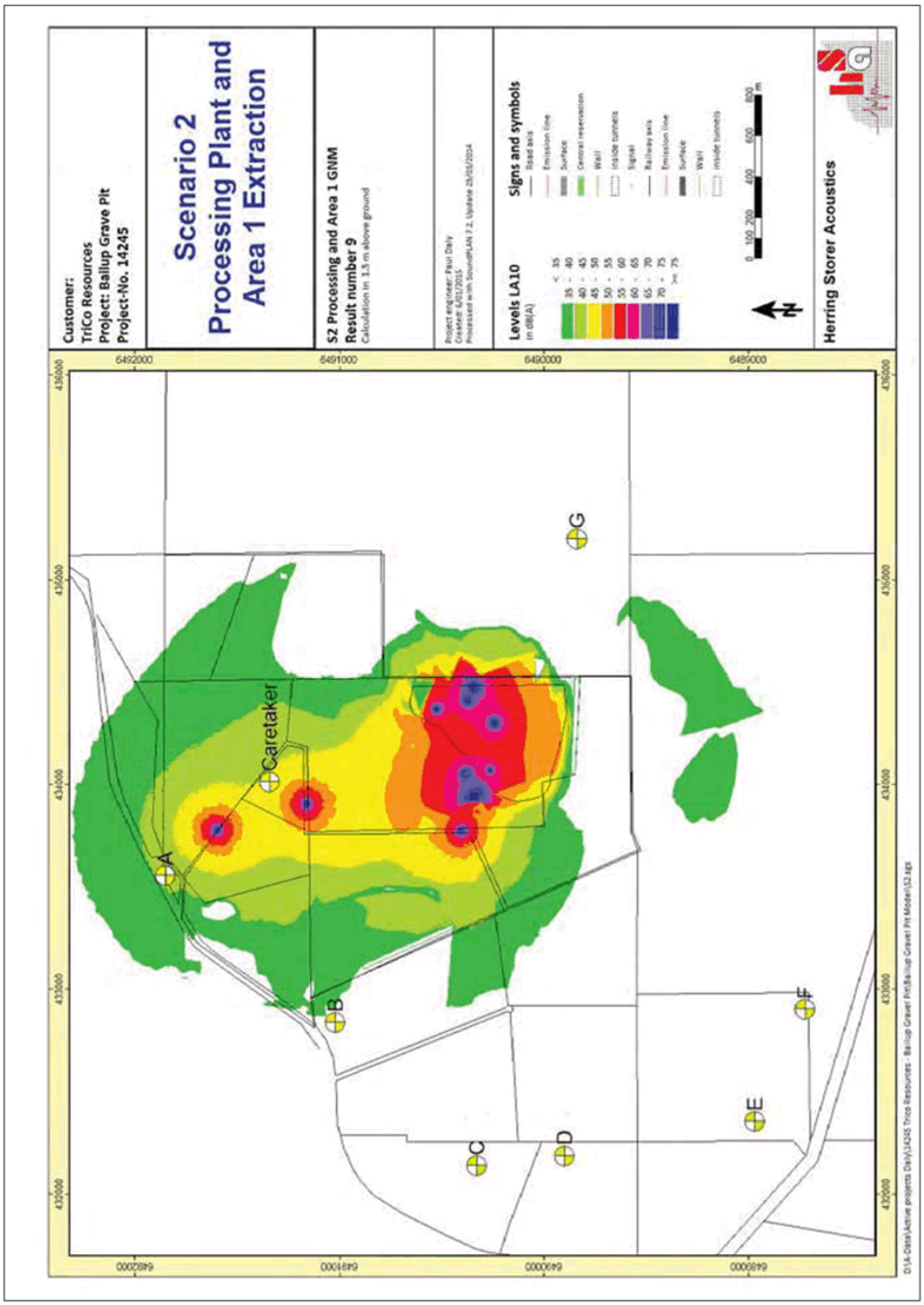
Herring Storer Acoustics
Our ref: 18713-1-14245



Herring Storer Acoustics
Our ref: 18713-1-14245

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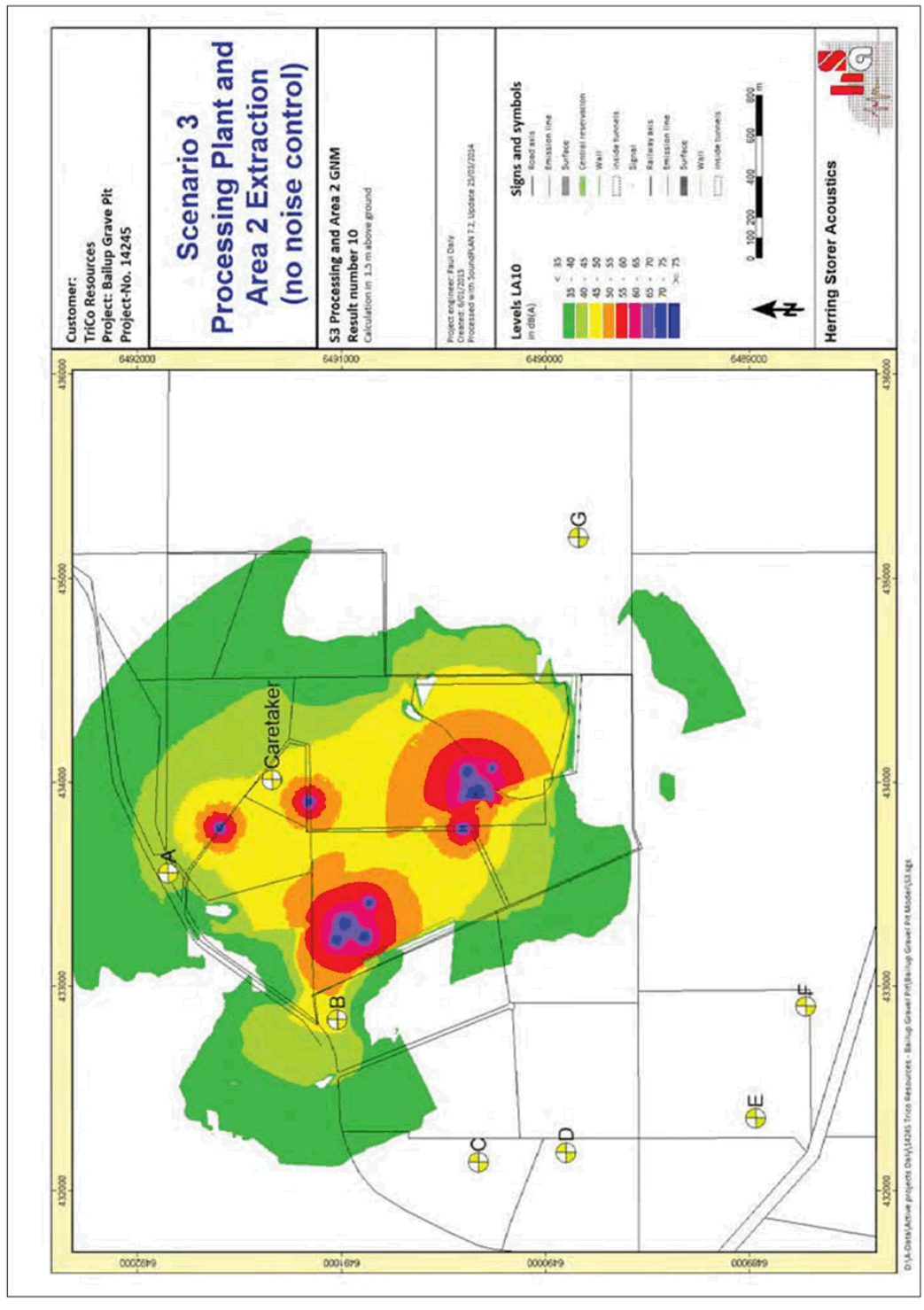
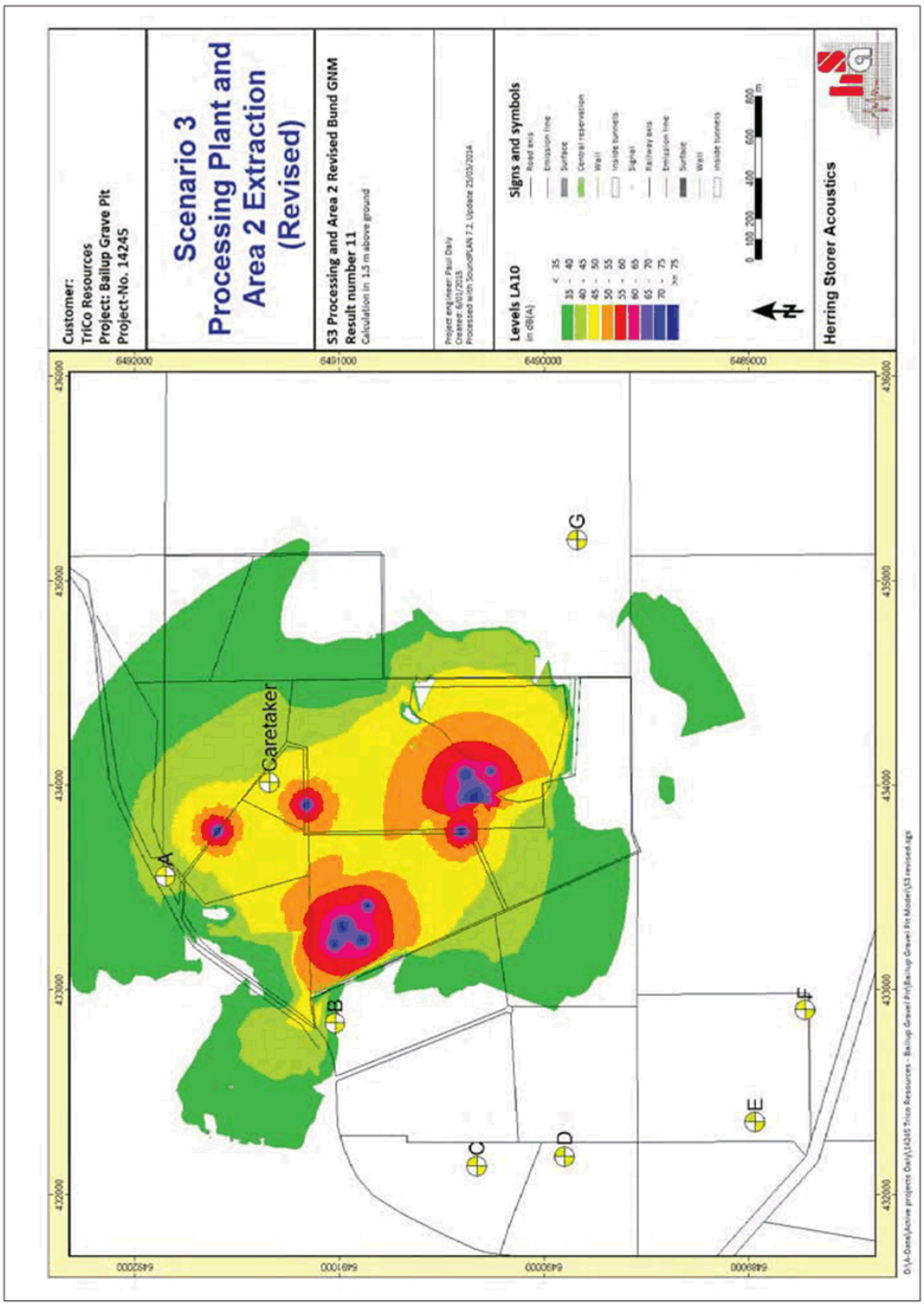


Herring Storer Acoustics
Our ref: 18713-1-14245

63



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Government of Western Australia
Department of Indigenous Affairs

Appendix E

ENQUIRIES : Sally McGann - Ph 08 9235 8138

OUR REF: 02/0569-02

YOUR REF: ID 60653

Mr David Chidlow
Senior Planning Officer
Shire of Mundaring
7000 Great Eastern Highway
Mundaring WA 6073

Dear Mr Chidlow

3650 (LOT 7) TOODYAY ROAD BAILUP PROPOSED EXTRACTIVE INDUSTRY

Thank you for your information regarding the Proposed Extractive Industry at 3650 (Lot 7) Toodyay Road, Bailup (the Proposal).

A search of the Register of Aboriginal Sites (Register) held by the Department of Indigenous Affairs (DIA) revealed that there is one site under the *Aboriginal Heritage Act, 1972,* (AHA) within the Proposal area:

DIA 3536 (Swan River)

It is possible that there are sites that have not yet been entered on the Register of Aboriginal Sites. The AHA protects all Aboriginal sites in Western Australia whether they are known to the DIA or not.

Please note that the provision of this information is not to be considered as a clearance (as DIA does not have the power to give approvals; rather DIA's role is to provide advice regarding heritage issues). The procedures to enable all relevant parties to follow the requirements of the AHA are outlined below.

Prior to any proposed development, so that no site is damaged or altered (which would result in an offence under section 17 of the AHA), it is recommended that suitably qualified consultants be engaged to conduct ethnographic and archaeological surveys of the area. This should ensure that all Aboriginal interest groups are consulted and that all sites on the designated land are identified and avoided. Such surveys would involve archival research, consultations and on the ground inspections.

It is DIA's preference that any development plans are modified to avoid damaging or altering any site. If this is not possible, and in order to avoid committing an offence under the AHA,

1st Floor, 197 St Georges Terrace, Perth, Western Australia 6000
PO Box 7770, Cloisters Square, Perth, Western Australia 6850
Telephone (08) 9235 8000 Facsimile (08) 9235 8088
www.dia.wa.gov.au
wa.gov.au

the landowner should seek the prior written consent of the Minister for Indigenous Affairs to use the land. This involves the submission of a notice in writing under section 18 of the AHA to the Aboriginal Cultural Material Committee.

Additional information on the AHA can be found on the DIA website, under Heritage and Culture.

http://www.dia.wa.gov.au/Heritage--Culture/

If you have any questions in regard to the above, please contact me on 9235 8138.

Yours sincerely

Sally McGann

Sally McGann
Senior Heritage Officer

12 November 2009

Government of **Western Australia**
Department of **Indigenous Affairs**

Aboriginal Heritage Inquiry System

Register of Aboriginal Sites

Search Criteria

1 sites in street address '3650 Toodyay Rd Ballup'.

Disclaimer

Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.

Copyright

Legend

Restriction

N	No restriction
M	Male access only
F	Female access

Access

C	Closed
O	Open
V	Vulnerable

Coordinate Accuracy

Accuracy is shown as a code in brackets following the site coordinates.

[Reliable]	The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
[Unreliable	The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

Status

L	Lodged
I	Insufficient Information
P	Permanent register
S	Stored data

IR	Insufficient Information (as assessed by Site Assessment Group)
PR	Permanent register (as assessed by Site Assessment Group)
SR	Stored data (as assessed by Site Assessment Group)

Site Assessment Group (SAG)

Sites lodged with the Department are assessed under the direction of the Registrar of Aboriginal Sites. These are not to be considered the final assessment.

Final assessment will be determined by the Aboriginal Cultural Material Committee (ACMC).

Spatial Accuracy

Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:Z50' means Easting=5000000, Zone=50.

Report created 23 Feb 2010 13:50:14. Identifier: 653330.

Department of Water
Government of Western Australia

Appendix F

Your ref: ID 60653
File ref: RF47-04
Enquiries: Brad Rimmer
Tel: 6250 8047

Chief Executive Officer
Shire of Mundaring
7000 Great Eastern Highway
Mundaring WA 6073

Attention: David Chidlow

Dear Mr Chidlow

RE: 3650 (LOT 7) TOODYAY ROAD, BAILUP – PROPOSED EXTRACTIVE INDUSTRY

Thank you for the above referral. The Department of Water (DoW) has considered the proposal and provides the following comments:

The proposed development is located within the Avon River Catchment Area, proclaimed under the Rights in Water and Irrigation Act (1914), where there may be a requirement to obtain a licence for the use of surface water. The issue of a licence is not guaranteed but if issued will contain a number of conditions including the quantity of water that can be pumped each year. The proponent is encouraged to contact the Department of Water's Swan Avon Region office on 6250 8000 to discuss water management options.

If you wish to discuss the matter further, please contact me on 6250 8047.

Yours sincerely,

BRAD RIMMER
NATURAL RESOURCE MANAGEMENT OFFICER
SWAN AVON REGION

Tegah (Tagoo)

7 December 2009

23/2/10 DOW est volume claims groundwater area

No hist record - - no ... - Soakwell (...)

88

Swan Avon Region
7 Ellam Street Victoria Park Western Australia 6100
Telephone (08) 6250 8000 Facsimile (08) 6250 8050
www.water.wa.gov.au
wa.gov.au

Appendix G

Government of Western Australia

RECEIVED
22 JAN 2010
SHIRE OF MUNDARING

MAIN ROADS
Western Australia

ABN: 50 860 676 021

Enquiries: Ms Assunta Dinardo on (08) 9323 4163
Our Ref: 09/5148 (D10#12843)
Your Ref: ID 60653

19 January 2010

FILE CODE TO 3.3650
SCANNED
22 JAN 2010
ID No. 68973

Shire of Mundaring
7000 Great Eastern Highway
MUNDARING WA 6073

ATTENTION: MR DAVID CHIDLOW

Dear Sir

PROPOSED DEVELOPMENT - LOT 7 (3650) TOODYAY ROAD BAILUP- PROPOSED EXTRACTIVE INDUSTRY

Thank you for your letter dated 5 November 2009 requesting Main Roads comments regarding the above proposal. Please accept my apologies for the delayed response.

The proposed development is acceptable to Main Roads subject to the following conditions being imposed:

1. No earthworks shall encroach onto the Toodyay Road reserve.
2. No stormwater drainage shall be discharged onto the Toodyay Road reserve.
3. The applicant shall make good any damage to the existing verge vegetation within the Toodyay Road reservation.
4. All vehicle access shall be restricted to the one existing crossover which shall be modified to a "type B" intersection treatment to accommodate the proposed turning movements into the site with provision for eastbound vehicles to pass in a safe manner. Main Roads Drawing 200131-0083 attached refers.
5. The applicant shall be responsible for all costs involved in the land acquisition, design and construction of the turn pocket and widening of the carriageway. This includes signing, road markings, relocation of services, street lighting and Main Roads costs involved in the checking of the design and construction drawings, including any site inspections.
6. Main Roads approval for the construction drawings is required before any work is undertaken with the Great Northern Highway reservation. A detailed traffic management safety plan while working within the road reservation is to be submitted as part of this approval.
7. The sight distance for right turn out movements is below Australian Standards and this will require remediation.

Australian Business Excellence Awards
Bronze Award 2007

Don Aitken Centre, Waterloo Crescent, East Perth or PO Box 6202 EAST PERTH Western Australia 6892
Telephone: 138 138 Facsimile: (08) 9323 4430 TTY: (08) 9428 2230
Email: enquiries@mainroads.wa.gov.au Website: www.mainroads.wa.gov.au

8. The proponent shall seal the existing crossover to reduce the amount of gravel being dragged onto Toodyay Road network. This will also assist with skid resistance and acceleration for trucks exiting the site.

9. The erection of advanced warning "Trucks Entering" signage will be required at appropriate locations, particularly on the eastbound side of the access point.

Advice to Applicant

1. All enquiries related to conditions 1-3 shall be directed to the Metropolitan Region - Asset Manager.

2. All enquiries related to conditions 4-9 shall be directed to the Traffic Services Co-Ordinator North-East. — Bruce = helpful

Main Roads personnel can be contacted at:- Sharon Forster 9323 4111

Main Roads WA
Waterloo Crescent
EAST PERTH WA 6004
Tel: 138 138
Fax: 9323 4430

If Council disagrees with or resolves not to include as part of its conditional approval any of the above conditions or advice to applicant, can you please inform Main Roads.

Also, please forward a copy of Council's final determination on this proposed development, quoting file reference 09/5148 (D10#12843).

If you require any further information please contact Ms Assunta Dinardo on (08) 9323 4163.

Yours faithfully

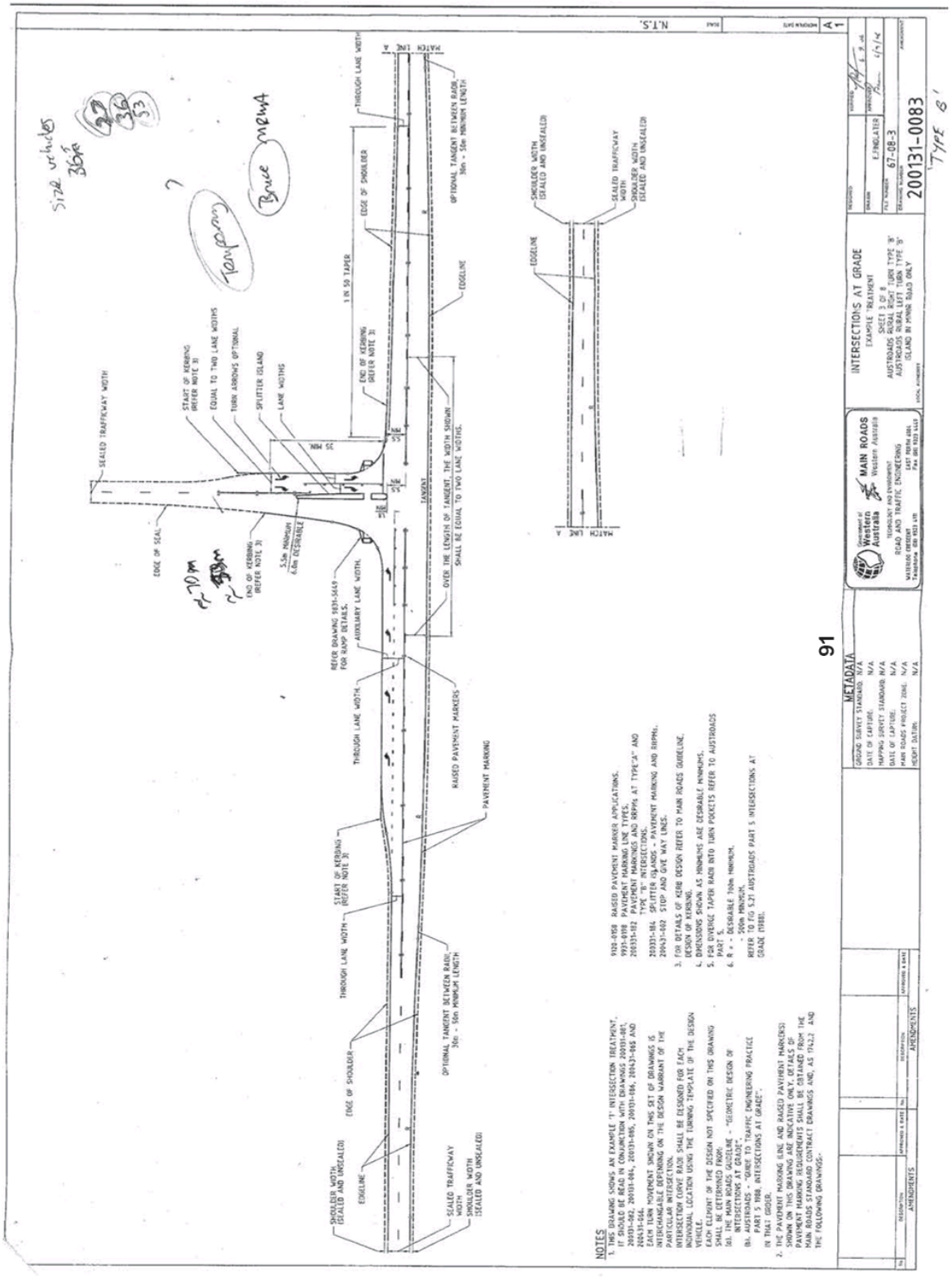
Assunta Dinardo
A/PLANNING INFORMATION MANAGER

Int design -

refer to Austroads guide to traffic engineering practices Part 5 Intersections @ grade pg 18+21

Traffic study to determine if just a slip lane on approach side or a painted island.

27.5m trucks size


INTERSECTIONS AT GRADE
EXAMPLE TREATMENT
SHEET 1 OF 8
AUSTROADS RURAL RIGHT TURN TYPE 'B'
AUSTROADS RURAL LEFT TURN TYPE 'S'
ISLAND IN MINOR ROAD ONLY
MAIN ROADS
Western Australia
67-08-3
200131-0083
NOTES
METADATA
AMENDMENTS
SEALED TRAFFICWAY WIDTH
EDGE OF SEAL
START OF KERBING (REFER NOTE 3)
EQUAL TO TWO LANE WIDTHS
TURN ARROWS OPTIONAL
SPLITTER ISLAND
LANE WIDTHS
END OF KERBING (REFER NOTE 3)
THROUGH LANE WIDTH
EDGE OF SHOULDER
1 IN 50 TAPER
OPTIONAL TANGENT BETWEEN RADII
EDGELINE
SHOULDER WIDTH (SEALED AND UNSEALED)
TANGENT
REFER DRAWING 9931-9449 FOR RAMP DETAILS.
AUXILIARY LANE WIDTH.
RAISED PAVEMENT MARKERS
PAVEMENT MARKING
MATCH LINE
N.T.S.

Appendix H

Government of **Western Australia**
Department of **Environment and Conservation**

Your ref: ID60653
Our ref: 2008/003571
Enquiries: Stefan de Haan
Phone: 9295 9100
Fax: 9295 9101
Email: stefan.dehaan@dec.wa.gov.au

David Chidlow
Senior Planning Officer
Shire of Mundaring
7000 Great Eastern Highway
MUNDARING WA 6073

3650 (LOT 7) TOODYAY ROAD, BAILUP – PROPOSED EXTRACTIVE INDUSTRY

I refer to your letter dated 5 November 2009, seeking comments on the above mentioned proposal. It is important to note that this advice focuses on the potential impacts to conservation assets for which the Department of Environment and Conservation (DEC) is responsible for and in no way should be considered as part of an endorsement for an Extractive Industries Licence, which follows a separate process. The Department of Environment and Conservation (DEC) provides the following advice:

Desktop analysis indicates that the subject site is significantly clear of remnant vegetation and is largely cleared agricultural land. The subject site contains no records of threatened flora, fauna or communities and no threatened species or communities were found within a close proximity to the development that may be considered at risk from industrial disturbance.

Given the proximity to other dwellings in the general area there are potential risks to adjoining landholders in terms of increased noise and dust as a result of excavation on Lot 7. It is important to note that any residential dwellings are sensitive sites are subject to buffer distances as determined on a case by case basis according to EPA guidance statement 3 (1995) and DEC's Industry Licensing Section will take this into account when reviewing any application for a licence.

Should the post mining rehabilitation be undertaken using native species rather than pasture it is important that flora species endemic to the site are used. This should be done to support local fauna populations, and species selection should be limited to endemic species rather than those simply suited to the environmental conditions.

If you have any queries regarding this advice please contact Paul Tholen at DEC's Perth Hills District office on 9295 9100.

Stefan de Haan
District Manager
Perth Hills District

16 February 2010

Dave Redmond

Perth Hills District
51 Mundaring Weir Road, MUNDARING WA, 6073
Ph: (08) 9295 9100 Fax: (08) 9295 9101
www.dec.wa.gov.au

RECEIVED 05-11-13

Appendix I

Western Australian Planning Commission

Our Ref : 27-50081-1
Your Ref :
Enquiries : Mario Carbone (Ph (08)6551 9617)

Benjamin Avila
945 Abernethy Road
OAKFORD WA 6121

Application for Approval to Commence Development dated 3 August 2010 received 10 August 2010.

Lot Number	:	7
Location	:	-
Plan / Diagram	:	9594
Volume/Folio	:	1824/309
Locality	:	Toodyay Road, Bailup
Owner	:	Elswick Developments Pty Ltd 36-38 Wallace Street ASHFIELD WA 6054

Under the provisions of the Metropolitan Region Scheme this application has been referred for determination by the Western Australian Planning Commission.

The application has now been considered by the Commission and the formal notice setting out the terms of the decision is attached.

A copy of this decision has been forwarded to the Local Government for information.

You are advised of the need to consult with the Local Government with regard to the gaining of all necessary approvals and the issuing of the requisite building licence.

This decision is issued pursuant to the provisions of the Metropolitan Region Scheme, and has been made by the Commission after due consideration of the regional planning implications of the proposal. The development must also comply with the requirements of Council's Local Planning Scheme(s) and any determination in this regard must be made by the local government. The Commission's decision, therefore, is made without prejudice to any others that may be separately required from Council.

Should the applicant be aggrieved by this decision there is a right to apply for a review pursuant to the provisions of Clause 33 of the Metropolitan Region Scheme. Such an application for review must be submitted to the State Administrative Tribunal, 12 St George's Terrace, Perth in accordance with Part 14 of the *Planning and Development Act 2005*. It is recommended that you contact the State Administrative Tribunal for further details (telephone 9219 3111) or go to its website: http://www.sat.justice.wa.gov.au.

140 William Street, Perth, Western Australia 6000, Locked Bag 2506 Perth, 6001
Tel: (08) 6551 9000; Fax: (08) 6551 9001; Infoline: 1800 626 477
e-mail: corporate@planning.wa.gov.au; web address http://www. planning.wa.gov.au
ABN 35 482 341 493

Western Australian Planning Commission

ADVICE TO APPLICANT

1. All development must comply with the provisions of the Shire of Mundaring Town Planning Scheme, the Environmental Protection (Noise) Regulations 1997, Building Code of Australia, Public Building Regulations, and all other relevant Acts, Regulations and Local Laws. This includes the provision of access and facilities for people with disabilities in accordance with the Building Code of Australia.

2. With regard to Condition 3, following this period, the development shall not be continued unless further development approval is sought and granted.

3. In relation to Condition 4, areas to be rehabilitated back to native vegetation to include black cockatoo feed species and for these areas to be fenced to provide protection from future grazing.

4. With regard to Condition 5, Main Roads Western Australia (MRWA) advises that:

   a) Standard design guidance drawings have been developed for 'type B' accesses which are attached to this approval (MRWA Drawings 200131-0082 and 200131-0083).

   b) MRWA approval of the construction drawings for the 'type B' access is required before any work is undertaken within the Toodyay Road road reserve

   c) A detailed safety plan addressing traffic management during construction of the 'type B' access within the road reserve, is to be approved on the advice of MRWA and to the satisfaction of the Western Australian Planning Commission.

   d) No earthworks shall encroach onto the Toodyay Road road reserve.

   e) No stormwater drainage shall be discharged onto the Toodyay Road road reserve.

   f) The applicant shall make good any damage to the existing verge vegetation within the Toodyay Road road reserve.

   g) The applicant shall be responsible for all costs involved in the provision of the 'type B' intersection. The costs involved may include, but are not limited to, land acquisition, design and construction of turn pockets, widening of the carriageway, signage, road markings, relocation of services, street lighting and MRWA costs involved in the checking of the design and construction drawings, including any site inspections.

5. With regard to condition 8, a separate development application will be required should blasting be proposed.

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ABN 35 482 341 493

Western Australian Planning Commission

6. The Department of Water advises that the proposed development is located within the Avon River Catchment Area, proclaimed under the Rights in Water and Irrigation Act (1914), where there may be a requirement to obtain a licence for the use of surface water. The issuing of a licence is not guaranteed but if issued will contain a number of conditions including the quantity of water that can be pumped each year. The proponent is encouraged to contact the Department of Water's Swan Avon Region office on 6250 8000 to discuss water management options.

7. The land is affected by a site Registered on the Aboriginal Heritage Inquiry System (Registered Site No. 3536). The applicant/owner is advised to brief all persons involved in site works and associated activities of their legal obligations with respect to the Aboriginal Heritage Act of WA (1972), prior to development commencing.

8. It is noted that the proposed development has the potential to impact upon the Carnaby's Black Cockatoo, a threatened species listed under the federal *Environmental Protection and Biodiversity Conservation* (EPBC) *Act (1999)*. It is therefore recommended that the proposed development be referred to the Australian Government Minister for Sustainability, Environment, Water, Population and Communities for a decision on whether assessment and approval is required under the EPBC Act.

Tim Hillyard
Secretary
Western Australian Planning Commission
31 October 2013

140 William Street, Perth, Western Australia 6000, Locked Bag 2506 Perth, 6001
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ABN 35 482 341 493

Western Australian Planning Commission

Our Ref : 27-50081-1
Your Ref :
Enquiries : Mario Carbone (Ph (08)6551 9617)

METROPOLITAN REGION SCHEME

Shire of Mundaring

APPROVAL TO COMMENCE DEVELOPMENT

Name and Address of Owner and Land on which Development Proposed:

Owner	:	Elswick Developments Pty Ltd 36-38 Wallace Street ASHFIELD WA 6054
Lot Number	:	7
Location	:	-
Plan / Diagram	:	9594
Volume/Folio	:	1824/309
Locality	:	Toodyay Road, Bailup
Application Date	:	3 August 2010
Application Receipt	:	10 August 2010
Development Description	:	Extractive Industry

The application for approval to commence development in accordance with the plans submitted thereto is granted subject to the following condition(s):

1. Lot 7 and the unallocated crown land (closed road), the subject of this application, being amalgamated prior to the commencement of excavation works on site.

2. This approval relates specifically to the plans entitled 'Proposed Extractive Industry Operation - Site Plan (23 September 2009)', 'Proposed Extractive Industry Operation - Revegetation Plan (23 September 2009)' and 'Bailup Proposed Extractive Industry - Revegetation Diagram 1 & 2' stamp dated by the Department of Planning 14 April 2011 (attached) and the associated Extractive Industry Application report (20 October 2009).

3. This approval is valid for a period of ten (10) years only from the date of this decision letter.

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Tel: (08) 6551 9000; Fax: (08) 6551 9001; Infoline: 1800 626 477
e-mail: corporate@planning.wa.gov.au; web address http://www. planning.wa.gov.au
ABN 35 482 341 493

Western Australian Planning Commission

4. Prior to the commencement of extraction works, a Management Plan is to be prepared and approved to the specifications of the Shire of Mundaring on advice from the Department of Parks and Wildlife/Department of Environmental Regulation and the satisfaction of the Western Australian Planning Commission. Development thereafter must be carried out in accordance with the approved Management Plan. The Management Plan shall be prepared in accordance with the requirements of State Planning Policy 2.4 - *Basis Raw Materials* and in addition shall address the following:

   (i) The effects of noise, dust, and vibration arising from the proposed extraction works and associated vehicular traffic on the amenity of the surrounding area, specifically Lot M1824, and any proposed control measures.

   (ii) The effects of noise, dust, and vibration arising from the proposed extraction works and associated vehicular traffic on fauna and flora within Red Brook Swamp and any proposed control measures.

   (iii) Rehabilitation of remnant vegetation and protection.

   (iv) Hours of operation.

5. Vehicular access and egress is limited to the existing cross-over which shall be modified to a 'type B' intersection treatment to accommodate turning movements into the site, with the provision for eastbound vehicles to pass in a safe manner, to be designed and constructed to the specifications of Main Roads Western Australia and to the satisfaction of the Western Australian Planning Commission. As part of these works the proponent shall seal the existing crossover.

6. The sight distance for the right-turn out movements from the site onto Toodyay Road being modified to comply with Australian Standards to the specifications of Main Roads Western Australia and the satisfaction of the Western Australian Planning Commission.

7. The erection of advanced warning 'Trucks Entering' signage at appropriate locations, particularly on the east bound side of the access point, to the specifications of Main Roads Western Australia and the satisfaction of the Western Australian Planning Commission.

8. No blasting shall be conducted.

If the development the subject of this approval is not substantially commenced within a period of two years from the date of this letter, the approval shall lapse and be of no further effect. Where an approval has so lapsed, no development shall be carried out without the further approval of the responsible authority having first been sought and obtained.

Tim Hillyard
Secretary
Western Australian Planning Commission
31 October 2013

96

140 William Street, Perth, Western Australia 6000, Locked Bag 2506 Perth, 6001
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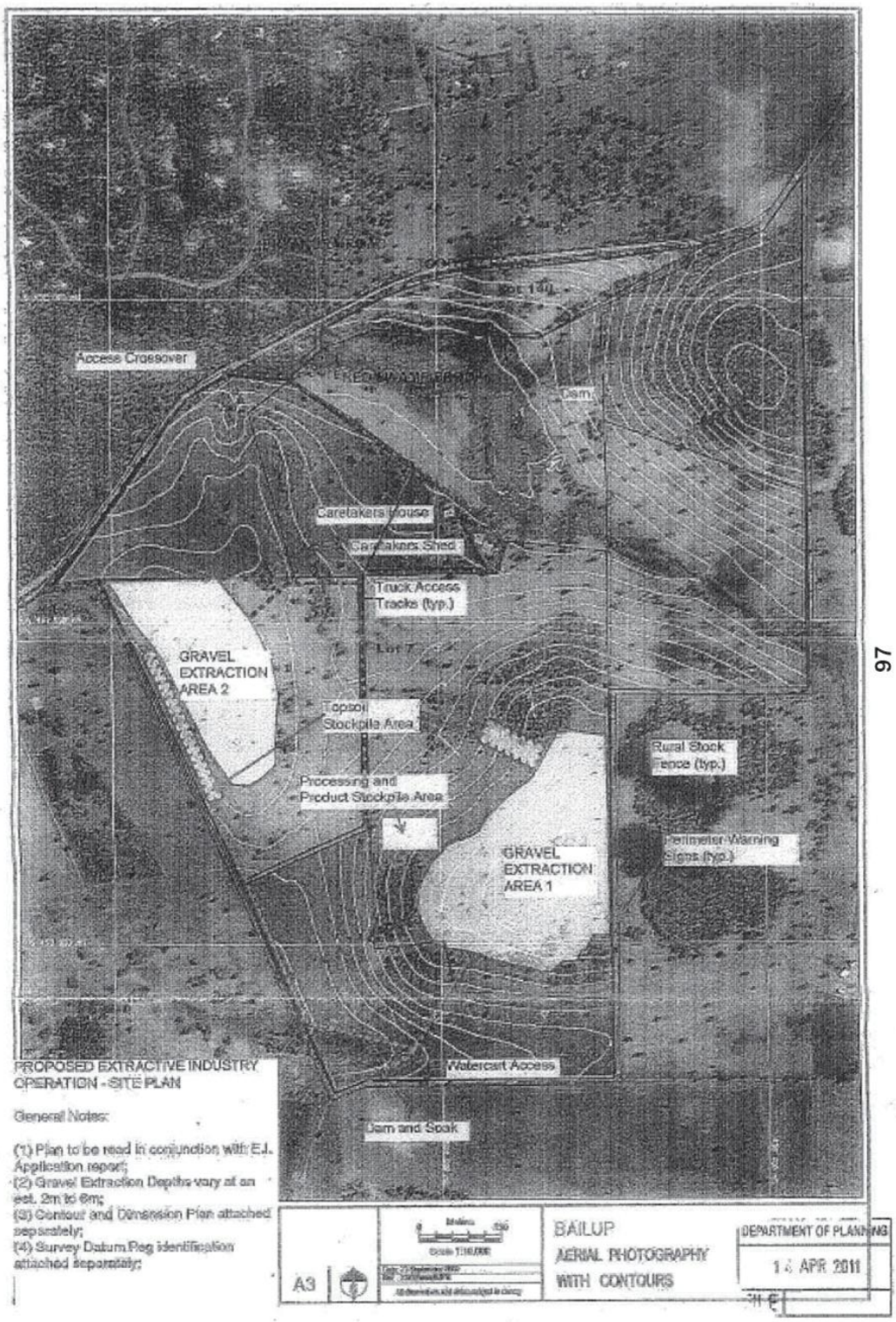
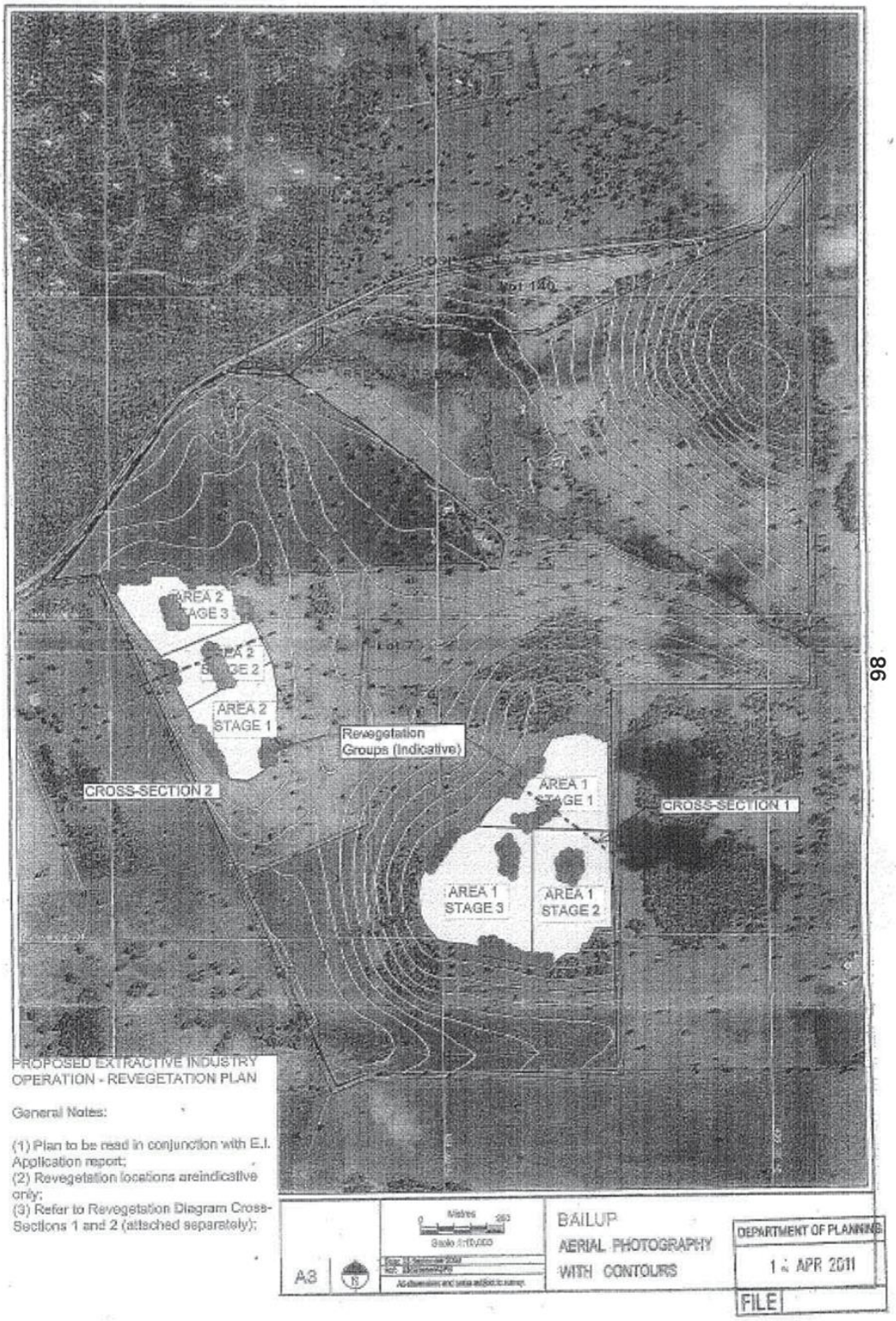
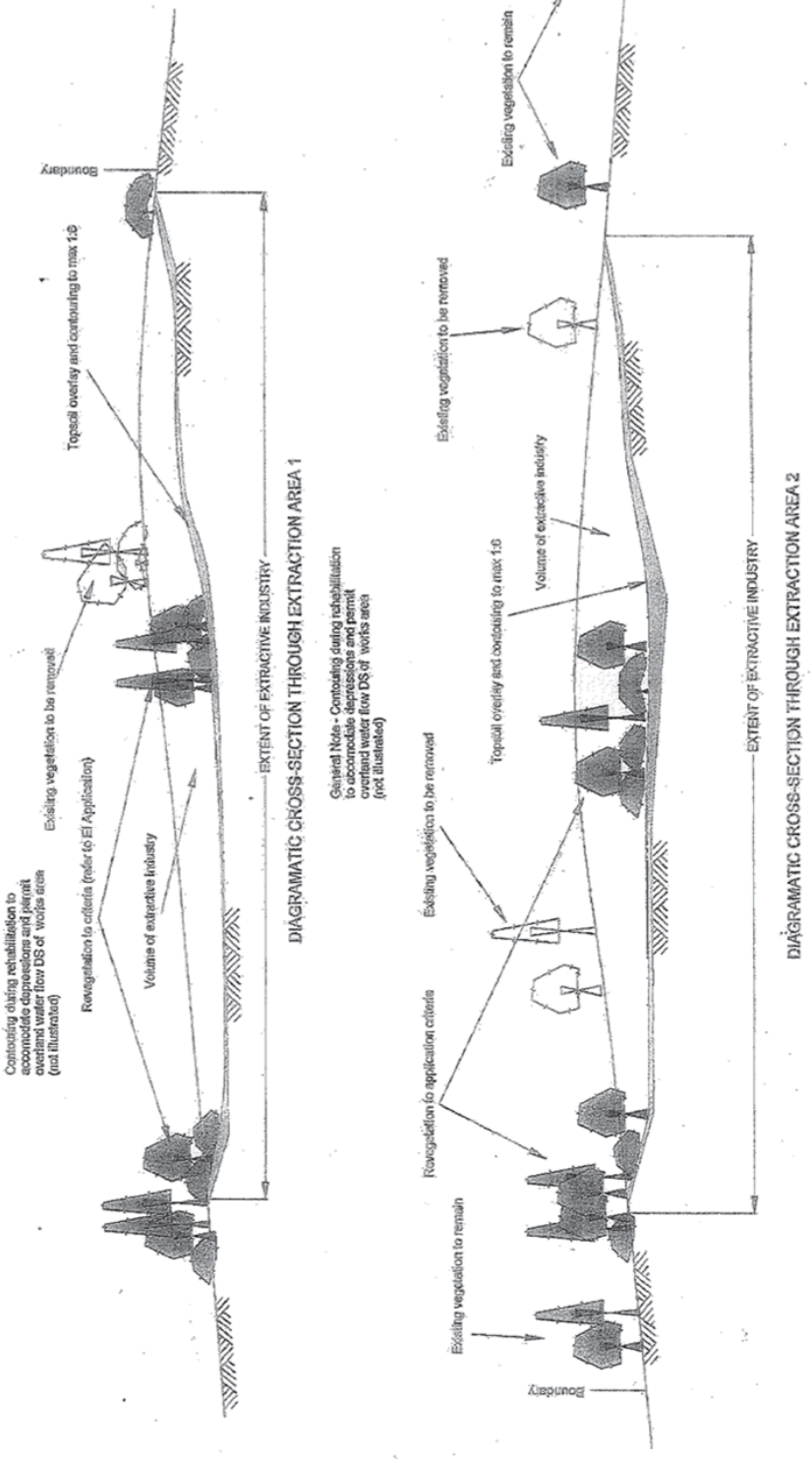
ABN 35 482 341 493

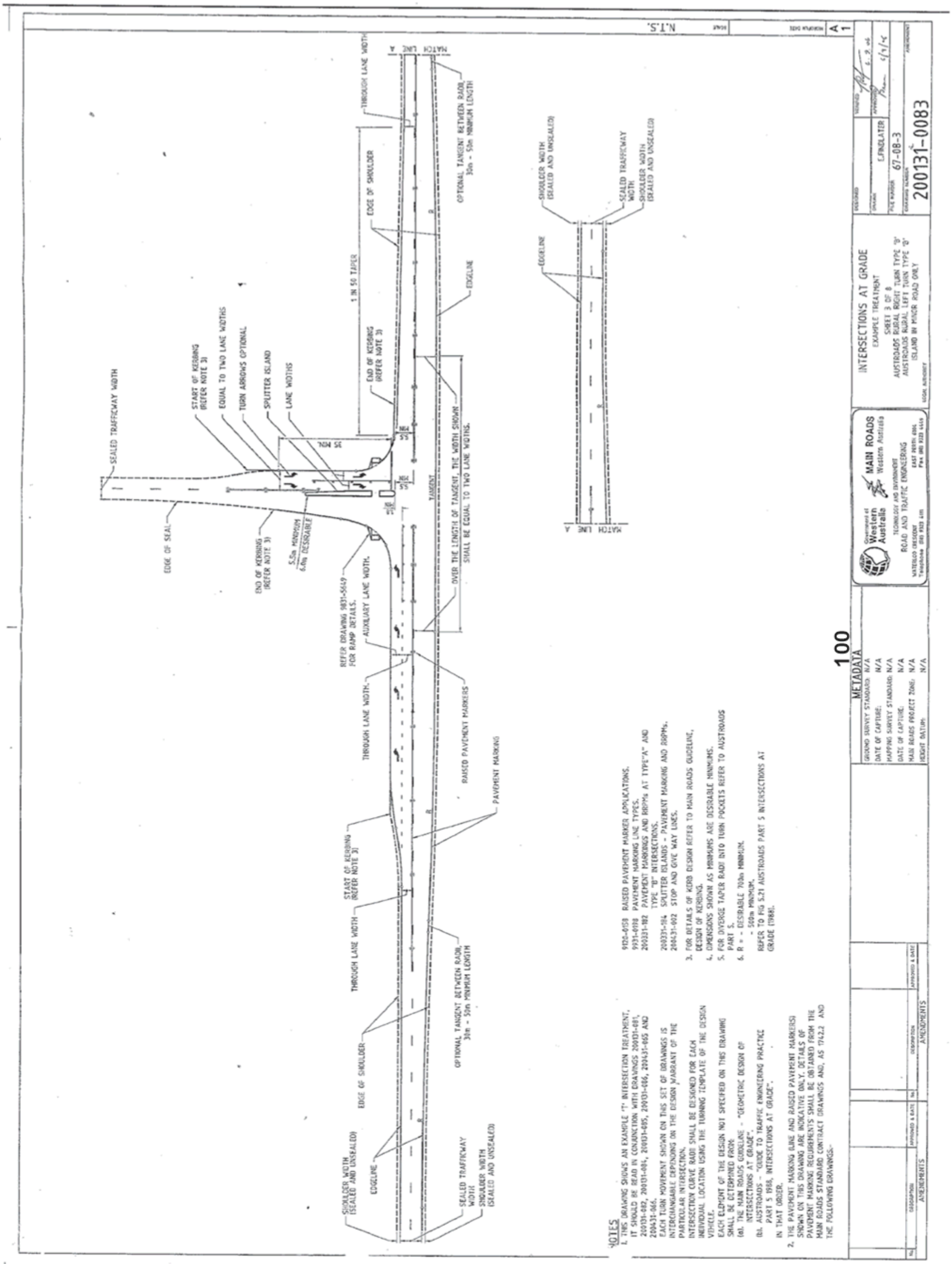

Access Crossover
Dam
Caretakers House
Caretakers Shed
Truck Access Tracks (typ.)
Lot 7
GRAVEL EXTRACTION AREA 2
Topsoil Stockpile Area
Processing and Product Stockpile Area
Rural Stock Fence (typ.)
Perimeter Warning Signs (typ.)
GRAVEL EXTRACTION AREA 1
Watercart Access
Dam and Soak
97
PROPOSED EXTRACTIVE INDUSTRY OPERATION - SITE PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Gravel Extraction Depths vary at an est. 2m to 6m;
(3) Contour and Dimension Plan attached separately;
(4) Survey Datum Peg identification attached separately;
A3
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS
DEPARTMENT OF PLANNING
14 APR 2011

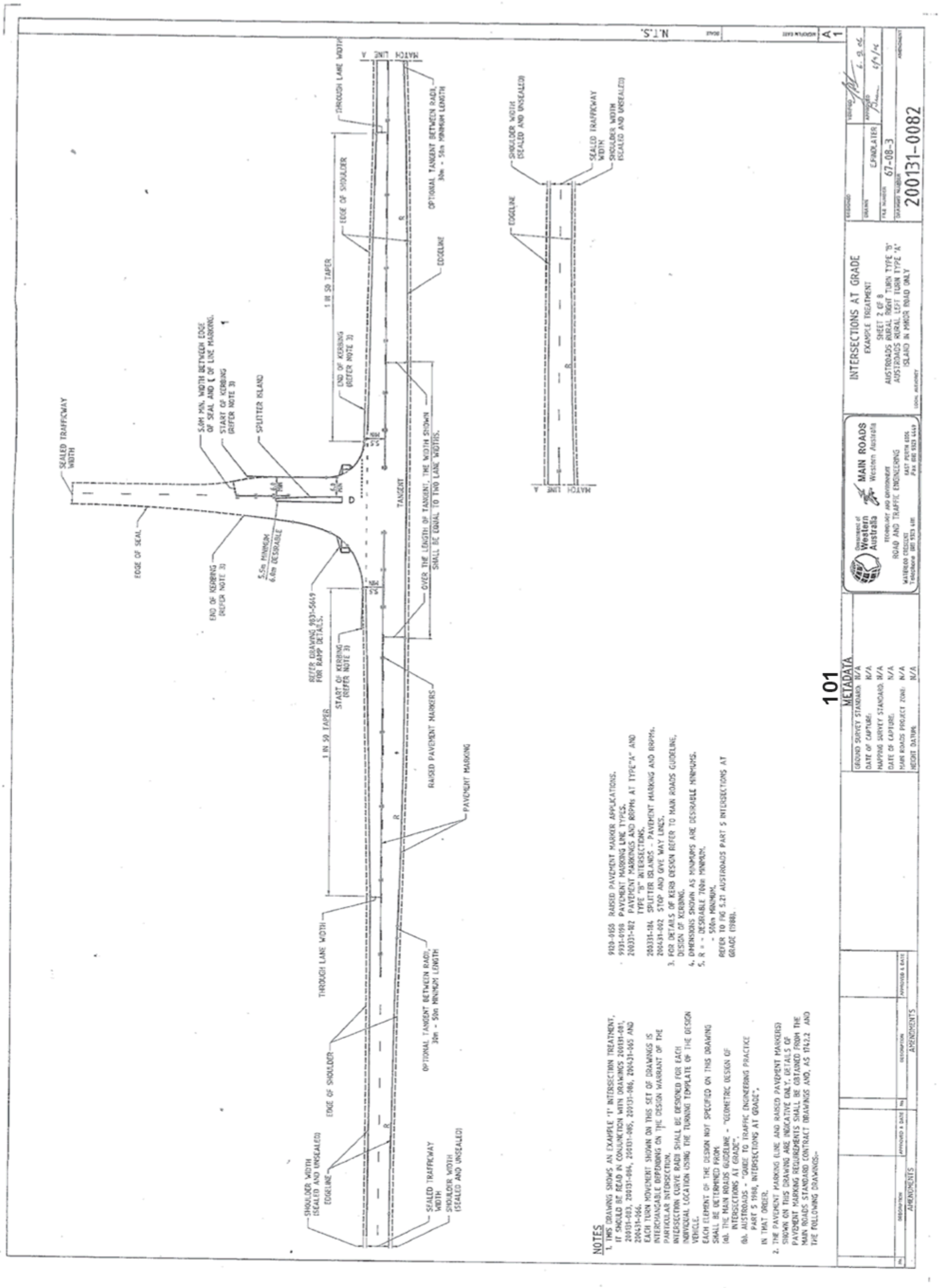

Lot 140
Lot 7
AREA 2
STAGE 3
AREA 2
STAGE 2
AREA 2
STAGE 1
Revegetation
Groups (Indicative)
CROSS-SECTION 2
AREA 1
STAGE 1
CROSS-SECTION 1
AREA 1
STAGE 3
AREA 1
STAGE 2
86
PROPOSED EXTRACTIVE INDUSTRY
OPERATION - REVEGETATION PLAN
General Notes:
(1) Plan to be read in conjunction with E.I. Application report;
(2) Revegetation locations areindicative only;
(3) Refer to Revegetation Diagram Cross-Sections 1 and 2 (attached separately);
Metres
Scale 1:10,000
A3
BAILUP
AERIAL PHOTOGRAPHY
WITH CONTOURS
DEPARTMENT OF PLANNING
1 APR 2011
FILE

BAILUP PROPOSED EXTRACTIVE INDUSTRY - REVEGETATION DIAGRAM 1 & 2



99


SEALED TRAFFICWAY WIDTH
EDGE OF SEAL
START OF KERBING (REFER NOTE 3)
EQUAL TO TWO LANE WIDTHS
TURN ARROWS OPTIONAL
END OF KERBING (REFER NOTE 3)
SPLITTER ISLAND
LANE WIDTHS
5.5m MINIMUM
6.0m DESIRABLE
35 MIN.
REFER DRAWING 9831-5649 FOR RAMP DETAILS.
1 IN 50 TAPER
SHOULDER WIDTH (SEALED AND UNSEALED)
EDGELINE
EDGE OF SHOULDER
THROUGH LANE WIDTH
THROUGH LANE WIDTH.
AUXILIARY LANE WIDTH.
END OF KERBING (REFER NOTE 3)
TANGENT
MATCH LINE A
SEALED TRAFFICWAY WIDTH
SHOULDER WIDTH (SEALED AND UNSEALED)
OPTIONAL TANGENT BETWEEN RADII, 30m - 50m MINIMUM LENGTH
RAISED PAVEMENT MARKERS
OVER THE LENGTH OF TANGENT, THE WIDTH SHOWN SHALL BE EQUAL TO TWO LANE WIDTHS.
PAVEMENT MARKING
NOTES
1. THIS DRAWING SHOWS AN EXAMPLE 'T' INTERSECTION TREATMENT, IT SHOULD BE READ IN CONJUNCTION WITH DRAWINGS 200131-081, 200131-082, 200131-084, 200131-085, 200131-086, 200431-065 AND 200431-066.
EACH TURN MOVEMENT SHOWN ON THIS SET OF DRAWINGS IS INTERCHANGABLE DEPENDING ON THE DESIGN WARRANT OF THE PARTICULAR INTERSECTION.
INTERSECTION CURVE RADII SHALL BE DESIGNED FOR EACH INDIVIDUAL LOCATION USING THE TURNING TEMPLATE OF THE DESIGN VEHICLE.
EACH ELEMENT OF THE DESIGN NOT SPECIFIED ON THIS DRAWING SHALL BE DETERMINED FROM:
(a). THE MAIN ROADS GUIDELINE - "GEOMETRIC DESIGN OF INTERSECTIONS AT GRADE".
(b). AUSTROADS - "GUIDE TO TRAFFIC ENGINEERING PRACTICE PART 5 1988, INTERSECTIONS AT GRADE".
IN THAT ORDER.
2. THE PAVEMENT MARKING (LINE AND RAISED PAVEMENT MARKERS) SHOWN ON THIS DRAWING ARE INDICATIVE ONLY. DETAILS OF PAVEMENT MARKING REQUIREMENTS SHALL BE OBTAINED FROM THE MAIN ROADS STANDARD CONTRACT DRAWINGS AND, AS 1742.2 AND THE FOLLOWING DRAWINGS:-
9120-0158 RAISED PAVEMENT MARKER APPLICATIONS.
9931-0198 PAVEMENT MARKING LINE TYPES.
200331-182 PAVEMENT MARKINGS AND RRPMs AT TYPE "A" AND TYPE "B" INTERSECTIONS.
200331-184 SPLITTER ISLANDS - PAVEMENT MARKING AND RRPMs.
200431-002 STOP AND GIVE WAY LINES.
3. FOR DETAILS OF KERB DESIGN REFER TO MAIN ROADS GUIDELINE, DESIGN OF KERBING.
4. DIMENSIONS SHOWN AS MINIMUMS ARE DESIRABLE MINIMUMS.
5. FOR DIVERGE TAPER RADII INTO TURN POCKETS REFER TO AUSTROADS PART 5.
6. R = - DESIRABLE 700m MINIMUM.
- 500m MINIMUM.
REFER TO FIG 5.21 AUSTROADS PART 5 INTERSECTIONS AT GRADE (1988).
100
METADATA
GROUND SURVEY STANDARD: N/A
DATE OF CAPTURE: N/A
MAPPING SURVEY STANDARD: N/A
DATE OF CAPTURE: N/A
MAIN ROADS PROJECT ZONE: N/A
HEIGHT DATUM: N/A
AMENDMENTS
Government of Western Australia
MAIN ROADS Western Australia
ROAD AND TRAFFIC ENGINEERING
INTERSECTIONS AT GRADE
EXAMPLE TREATMENT
SHEET 3 OF 8
AUSTROADS RURAL RIGHT TURN TYPE 'B'
AUSTROADS RURAL LEFT TURN TYPE 'B'
ISLAND IN MINOR ROAD ONLY
E.FINDLATER
67-08-3
200131-0083
N.T.S.
A1


SEALED TRAFFICWAY WIDTH
EDGE OF SEAL
END OF KERBING (REFER NOTE 3)
5.0M MIN. WIDTH BETWEEN EDGE OF SEAL AND ℄ OF LINE MARKING.
START OF KERBING (REFER NOTE 3)
SPLITTER ISLAND
5.5m MINIMUM 6.0m DESIRABLE
REFER DRAWING 9031-5649 FOR RAPP DETAILS.
SHOULDER WIDTH (SEALED AND UNSEALED)
EDGELINE
EDGE OF SHOULDER
THROUGH LANE WIDTH
1 IN 50 TAPER
START OF KERBING (REFER NOTE 3)
END OF KERBING (REFER NOTE 3)
TANGENT
MATCH LINE A
SEALED TRAFFICWAY WIDTH
SHOULDER WIDTH (SEALED AND UNSEALED)
OPTIONAL TANGENT BETWEEN RADII, 30m - 50m MINIMUM LENGTH
RAISED PAVEMENT MARKERS
OVER THE LENGTH OF TANGENT, THE WIDTH SHOWN SHALL BE EQUAL TO TWO LANE WIDTHS.
PAVEMENT MARKING
NOTES
1. THIS DRAWING SHOWS AN EXAMPLE 'T' INTERSECTION TREATMENT, IT SHOULD BE READ IN CONJUNCTION WITH DRAWINGS 200131-081, 200131-083, 200131-084, 200131-085, 200131-086, 200431-065 AND 200431-066.
EACH TURN MOVEMENT SHOWN ON THIS SET OF DRAWINGS IS INTERCHANGABLE DEPENDING ON THE DESIGN WARRANT OF THE PARTICULAR INTERSECTION.
INTERSECTION CURVE RADII SHALL BE DESIGNED FOR EACH INDIVIDUAL LOCATION USING THE TURNING TEMPLATE OF THE DESIGN VEHICLE.
EACH ELEMENT OF THE DESIGN NOT SPECIFIED ON THIS DRAWING SHALL BE DETERMINED FROM:
(a). THE MAIN ROADS GUIDELINE - "GEOMETRIC DESIGN OF INTERSECTIONS AT GRADE".
(b). AUSTROADS - "GUIDE TO TRAFFIC ENGINEERING PRACTICE PART 5 1988, INTERSECTIONS AT GRADE".
IN THAT ORDER.
2. THE PAVEMENT MARKING (LINE AND RAISED PAVEMENT MARKERS) SHOWN ON THIS DRAWING ARE INDICATIVE ONLY. DETAILS OF PAVEMENT MARKING REQUIREMENTS SHALL BE OBTAINED FROM THE MAIN ROADS STANDARD CONTRACT DRAWINGS AND, AS 1742.2 AND THE FOLLOWING DRAWINGS:-
9120-0150 RAISED PAVEMENT MARKER APPLICATIONS.
9931-0198 PAVEMENT MARKING LINE TYPES.
200331-182 PAVEMENT MARKINGS AND RRPMs AT TYPE "A" AND TYPE "B" INTERSECTIONS.
200331-184 SPLITTER ISLANDS - PAVEMENT MARKING AND RRPMs.
200431-002 STOP AND GIVE WAY LINES.
3. FOR DETAILS OF KERB DESIGN REFER TO MAIN ROADS GUIDELINE, DESIGN OF KERBING.
4. DIMENSIONS SHOWN AS MINIMUMS ARE DESIRABLE MINIMUMS.
5. R = - DESIRABLE 700m MINIMUM.
- 500m MINIMUM.
REFER TO FIG 5.21 AUSTROADS PART 5 INTERSECTIONS AT GRADE (1988).
N.T.S.
AMENDMENTS
101
METADATA
GROUND SURVEY STANDARD: N/A
DATE OF CAPTURE: N/A
MAPPING SURVEY STANDARD: N/A
DATE OF CAPTURE: N/A
MAIN ROADS PROJECT ZONE: N/A
HEIGHT DATUM: N/A
Government of Western Australia
MAIN ROADS Western Australia
ROAD AND TRAFFIC ENGINEERING
INTERSECTIONS AT GRADE
EXAMPLE TREATMENT
SHEET 2 OF 8
AUSTROADS RURAL RIGHT TURN TYPE 'B'
AUSTROADS RURAL LEFT TURN TYPE 'A'
ISLAND IN MINOR ROAD ONLY
E.FINDLATER
67-08-3
200131-0082
A1

Appendix J

Shire of Mundaring

7000 GREAT EASTERN HIGHWAY MUNDARING WA 6073 TELEPHONE (08) 9290 6666 FACSIMILE (08) 9295 3288
ABN: 204 3148 7930 WEBSITE: www.mundaring.wa.gov.au EMAIL: shire@mundaring.wa.gov.au

Our Ref: To 3.3650
28 October 2010

RECEIVED 29.10.10

Greenwave Nominees
945 Abernethy Road
OAKFORD WA 6073

Dear Sir/Madam

NO. 3650 TOODYAY ROAD, BAILUP – PROPOSED EXTRACTIVE INDUSTRY

I am pleased to advise that your application for the proposed Extractive Industry has been approved.

Council at its meeting held on the 26 October 2010 considered your application and resolved as follows:

"That Council:

A. Grants approval for the proposed Extractive Industry at 3650 (Lot 7) Toodyay Road, Bailup, subject to the attached conditions:

B. Approves the extractive industry licence application for the extractive industry at 3650 Lot 7, Toodyay Road, Bailup in accordance with the requirements of the Shire's Extractive Industry Local Law, subject to the attached condition.

1. The operation of the extractive industry shall be conducted in accordance with the approved management plan

C. Recommends the Western Australian Planning Commission approves the proposed extractive industry at 3650 (Lot 7) Toodyay Road, Bailup, in accordance with the Conditions set out in Part A."

Once again, I am pleased to advise of your approval which is attached to this letter and should you require further information, please do not hesitate to contact **Christopher Jennings** of the Shire's Planning Services Team on **9290 6666**.

Yours sincerely

Mark Luzi **102**
DIRECTOR STATUTORY SERVICES
102708.cj

SHIRE OF MUNDARING

TOWN PLANNING SCHEME NO. 3

DETERMINATION OF APPLICATION FOR PLANNING APPROVAL

OWNER'S NAME:	**ELSWICK DEVELOPMENT PTY LTD**
APPLICANT'S NAME:	**GREENWAVE NOMINEES**
ADDRESS OF DEVELOPMENT:	**3650 TOODYAY ROAD, BAILUP**
DESCRIPTION OF PROPOSED DEVELOPMENT:	**EXTRACTIVE INDUSTRY**
DATE OF APPLICATION:	**27 OCTOBER 2009**
DATE OF COUNCIL RESOLUTION:	**26 OCTOBER 2010**

Your application for planning approval to commence development and/or use on the above lot has been approved subject to the following conditions.

CONDITIONS

REQUIRED PRIOR TO OPERATION

An Officer of the Statutory Services Directorate shall be requested by the developer to check that the following requirements have been met prior to the commencement of operations:

1. The applicant shall submit a composite management plan (that includes all the information submitted in the various draft iteration plans from the mediation process). In addition, the management plan must contain:

   a) A clearer diagram notation to identify location of the fixed temporary crushing plant.

   b) An analysis of the wind-rose details from Bureau of Meteorology data to be provided and potential dust management implications to be amended accordingly.

2. Evidence that any ethnographic and archaeological survey requirements by the Department of Indigenous Affairs have been satisfied.

3. A turning pocket and widening of the carriageway for Toodyay Road is to be constructed to the satisfaction of Main Roads Western Australia.

4. The applicant shall seal the existing crossover to reduce the amount of gravel being dragged onto the Toodyay Road network to the satisfaction of Main Roads Western Australia.

5. The applicant shall erect "Trucks Entering" signage at appropriate locations, particularly on the eastbound side of the access point to the satisfaction of Main Roads Western Australia.

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6. No earthworks shall encroach onto the Toodyay Road reserve.

7. The applicant shall make good any damage to the existing verge vegetation within the Toodyay Road reserve to the satisfaction of Main Roads Western Australia.

8. All vehicle access shall be restricted to the one existing crossover which shall be modified to a "type B" intersection treatment to accommodate the proposed turning movements into the site with provision for eastbound vehicles to pass in a safe manner to the satisfaction of Main Roads Western Australia.

REQUIRED DURING OPERATION

The following conditions are not required to be checked for compliance prior to commencement of operations but still apply to the development.

9. A bond shall be taken by the Shire for site revegetation and remediation works in accordance with the requirements of the Extractive Industry Local Law.

10. No explosive devices shall be stored on site without prior approval of the Shire.

11. No blasting shall be conducted without the prior approval of the Shire and other relevant state government agencies.

12. Red Swamp Brook shall not be interfered with, nor will there be any water drained from it, as a result of operations of the extractive industry.

13. No works associated with the alteration to the size of any other watercourses (including dams) without prior approval from the Shire. Further, the dam to the south west corner of the property, from which water is to be drawn for dust management, is not to be increased in size without planning approval.

14. No stormwater drainage shall be discharged onto the Toodyay Road reserve;

Mark Luzi
DIRECTOR STATUTORY SERVICES

28/10/2020.
Date

Appendix K

REGISTER NUMBER	
556/DP77558	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	N/A

WESTERN AUSTRALIA

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 2822 FOLIO 505

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 556 ON DEPOSITED PLAN 77558

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

TRICO RESOURCES PTY LTD OF SUITE 3, 465 SCARBOROUGH BEACH ROAD, OSBORNE PARK
(AF M408366) REGISTERED 19 SEPTEMBER 2013

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. *EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER 6434/1946.
2. *EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER 8309/1950.
3. *EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER 5589/1953.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP77558.
PREVIOUS TITLE: 1824-309.
PROPERTY STREET ADDRESS: 3650 TOODYAY RD, BAILUP.
LOCAL GOVERNMENT AREA: SHIRE OF MUNDARING, SHIRE OF TOODYAY.

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING K402503

105

LANDGATE COPY OF ORIGINAL NOT TO SCALE Tue Jan 28 07:14:53 2014 JOB 43777518

Project:	Proposed Raw Material Extraction Lot 556 Toodyay Road, Bailup
Client:	TriCo Resources
Author:	Keli Li / Paul Nguyen
Doc No:	1801006-TIA-001
Revision:	H

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Document Status

Revision	Prepared By	Reviewed By	Approved By	Issue	Date
A	Keli Li	Leigh Dawson	Leigh Dawson	Draft for Review	17/01/18
B	Keli Li	Leigh Dawson	Leigh Dawson	Client Comment	06/02/18
C	Keli Li	Leigh Dawson	Leigh Dawson	MRWA Comments	16/04/18
D	Keli Li	Leigh Dawson	Leigh Dawson	MRWA Comments	08/08/18
E	Keli Li	Leigh Dawson	Leigh Dawson	MRWA Comments	13/11/18
F	Keli Li	Leigh Dawson	Leigh Dawson	MRWA Comments	17/12/18
G	Keli Li	Leigh Dawson	Leigh Dawson	MRWA Comments	23/01/19
H	Paul Nguyen	Tony Shaw	Tony Shaw	Revised Access	21/05/20

File Reference: Y:\Jobs Active 2018\T&T - Traffic and Parking\TriCo Resources_Lot 556 Toodyay Road_1801006\Reports\TIA - Lot 556 Toodyay Road Rev_H.docx

Contents

Figures

Tables

1. Introduction

1.1. Background

TriCo Resources (client) is proposing to construct and operate basic raw material extraction and processing facility at Lot 556 (No. 3650) Toodyay Road, Bailup. The majority of the site is in the Shire of Mundaring with the northern section of the site within the Shire of Toodyay.

The client has a current Extraction Industry Approval to haul 47,000 tonnes per annum (tpa) from Lot 7 Toodyay Road, Bailup and the new transport proposal is proposed to increase the haul capacity to 950,000tpa. Lot 7 Toodyay Road has been changed to Lot 556 Toodyay Road after an amalgamation of approximate 8,000sqm into the title.

The site location is shown in **Figure 1** and an aerial view of the site is shown in **Figure 2**.

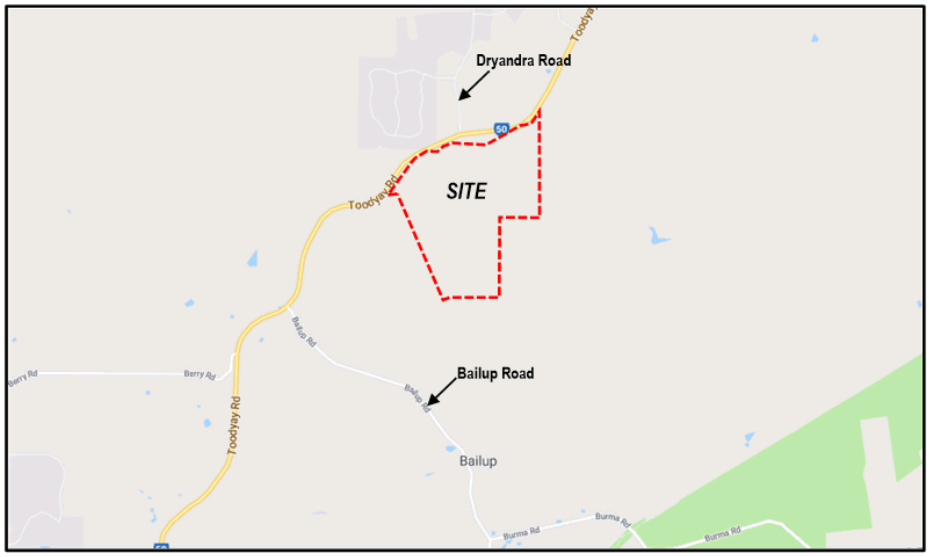


Figure 1: Location of Proposed Development

Figure 2: Aerial Photo

Shawmac has been engaged by TriCo Resources to undertake a Transport Impact Assessment (TIA) of the proposed operation. The TIA has been undertaken in accordance with the Western Australian Planning Commission's (WAPC) *Transport Impact Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016)*. The assessment includes:

- Collection of background data including traffic counts and crash data.
- Details of the proposed extraction and transportation of basic raw material as provided by the client. This includes the proposed yields, operating hours and periods, vehicle numbers types and loads.
- Assessment of the proposed site access in accordance with MRWA and Austroads guidelines with regards to safety, sight distance requirements, geometry and interaction with non-site traffic.
- Assessment of the development impact on the adjacent road network including any relevant mid-block locations and at nearby intersections.
- Review of any site-specific safety issues associated with the proposal.
- Identify any required management measures to ensure acceptability of the proposal.

2. Existing Situation

2.1. Land Use

The site is currently zoned as *General Agriculture* within the Shire of Mundaring and *Rural* in the Shire of Toodyay. The site is currently used for farming.

2.2. Road Network

2.2.1. Hierarchy

The layout and hierarchy of the adjacent road network is shown in **Figure 3**.

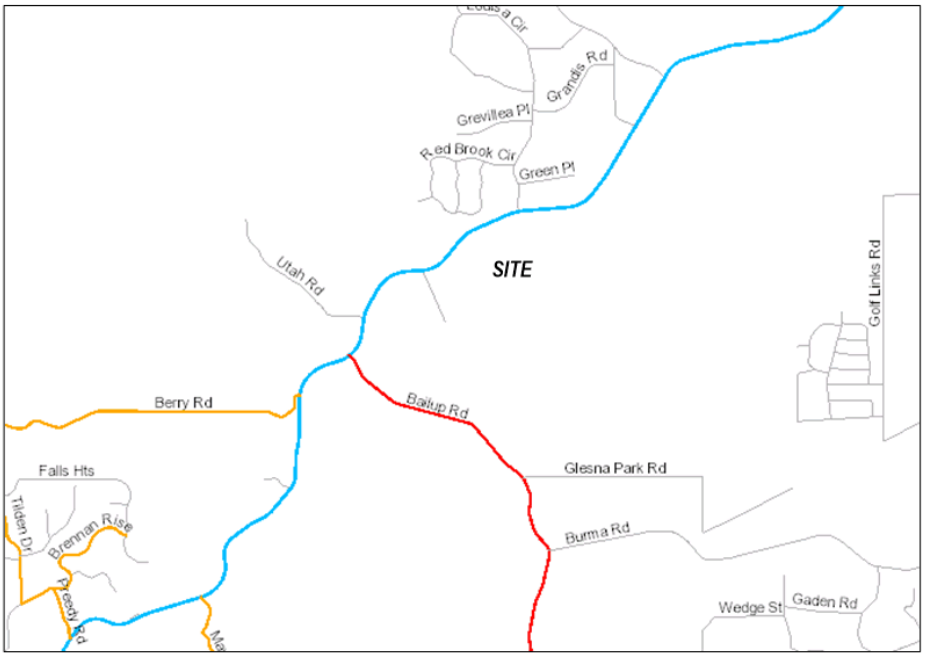


Figure 3: Road Hierarchy

2.2.2. Cross Section

Toodyay Road in the vicinity of the site has been constructed as two-lane, undivided carriageway with a 7.2m sealed width and 2.0 wide unsealed shoulders on both sides. The cross-section of Toodyay Road in the vicinity of the site access is shown in **Figure 4** and **Figure 5**.

Figure 4: Toodyay Road Looking North-East

Figure 5: Toodyay Road Looking South-West

2.2.3. Speed Limit

The existing speed limit for Toodyay Road is 100km/hr.

2.2.4. RAV Status

Toodyay Road currently allows Restricted Access Vehicles (RAV) up to Category 4 with some conditions along the sections through Red Hill and Middle Swan.

2.2.5. Traffic Volumes

The latest traffic counts for Toodyay Road were obtained from Main Roads WA's Traffic Map with the average weekday traffic shown in **Figure 6** and the average weekend traffic shown in **Figure 7**.

mainroads WESTERN AUSTRALIA

SITE 51573

Hourly Volume

Toodyay Rd (M026)

West of Dryandra Rd (SLK 13.00)

2019/20
Monday to Friday

	All Vehicles			Heavy Vehicles			
	EB	WB	Both	EB	WB	Both	%
00:00	4	1	5	0	0	0	0.0
01:00	1	1	2	0	0	0	0.0
02:00	3	2	5	1	0	1	20.0
03:00	2	9	11	0	1	1	9.1
04:00	4	34	38	0	3	3	7.9
05:00	28	80	108	4	10	14	13.0
06:00	67	127	194	14	20	34	17.5
07:00	62	153	215	8	31	39	18.1
08:00	63	133	196	12	20	32	16.3
09:00	63	116	179	10	18	28	15.6
10:00	79	99	178	13	17	30	16.9
11:00	85	88	173	15	21	36	20.8
12:00	80	84	164	9	20	29	17.7
13:00	87	81	168	9	19	28	16.7
14:00	99	87	186	8	17	25	13.4
15:00	134	80	214	11	15	26	12.1
16:00	152	82	234	12	17	29	12.4
17:00	159	65	224	6	13	19	8.5
18:00	109	37	146	4	4	8	5.5
19:00	57	23	80	1	2	3	3.8
20:00	37	15	52	2	2	4	7.7
21:00	26	10	36	1	1	2	5.6
22:00	16	5	21	1	0	1	4.8
23:00	9	3	12	1	0	1	8.3
TOTAL	1426	1415	2841	142	251	393	13.8

Peak Statistics

AM	TIME	11:00	06:45	06:45	10:30	07:00	06:30
	VOL	85	154	215	16	31	39
PM	TIME	17:00	14:15	16:15	15:30	13:15	15:30
	VOL	159	89	237	16	20	30

Figure 6: Toodyay Road Traffic Volumes - Weekday

mainroads WESTERN AUSTRALIA

SITE 51573

Hourly Volume

Toodyay Rd (M026)

West of Dryandra Rd (SLK 13.00)

2019/20
Weekend

	All Vehicles			Heavy Vehicles			
	EB	WB	Both	EB	WB	Both	%
00:00	11	3	14	0	0	0	0.0
01:00	6	1	7	0	0	0	0.0
02:00	4	1	5	1	0	1	20.0
03:00	2	3	5	0	0	0	0.0
04:00	3	8	11	1	1	2	18.2
05:00	9	20	29	1	2	3	10.3
06:00	28	34	62	4	2	6	9.7
07:00	46	70	116	3	10	13	11.2
08:00	69	110	179	5	14	19	10.6
09:00	88	133	221	4	14	18	8.1
10:00	119	142	261	5	15	20	7.7
11:00	117	132	249	6	15	21	8.4
12:00	113	113	226	5	12	17	7.5
13:00	114	117	231	3	10	13	5.6
14:00	106	111	217	2	10	12	5.5
15:00	114	103	217	1	8	9	4.1
16:00	113	92	205	2	8	10	4.9
17:00	102	57	159	3	6	9	5.7
18:00	70	41	111	1	3	4	3.6
19:00	50	30	80	0	2	2	2.5
20:00	36	17	53	1	2	3	5.7
21:00	22	12	34	0	1	1	2.9
22:00	19	14	33	0	3	3	9.1
23:00	14	3	17	0	0	0	0.0
TOTAL	1375	1367	2742	48	138	186	6.8

Peak Statistics

AM	TIME	09:45	10:15	10:15	07:15	10:15	11:00
	VOL	119	144	263	6	16	21
PM	TIME	15:30	12:30	12:30	12:15	12:30	12:15
	VOL	116	122	233	7	14	21

Figure 7: Toodyay Road Traffic Volumes - Weekend

A network performance site on Toodyay Road west of Fernie Road indicates that traffic reduced from 2016/17 to 2018/19 and then increased from 2018/19 to 2019/20.

2.2.6. Crash History

The 5-year crash history of Toodyay Road between Bailup Road and Dryandra Road was obtained from Main Roads WA as summarised in **Figure 8**.

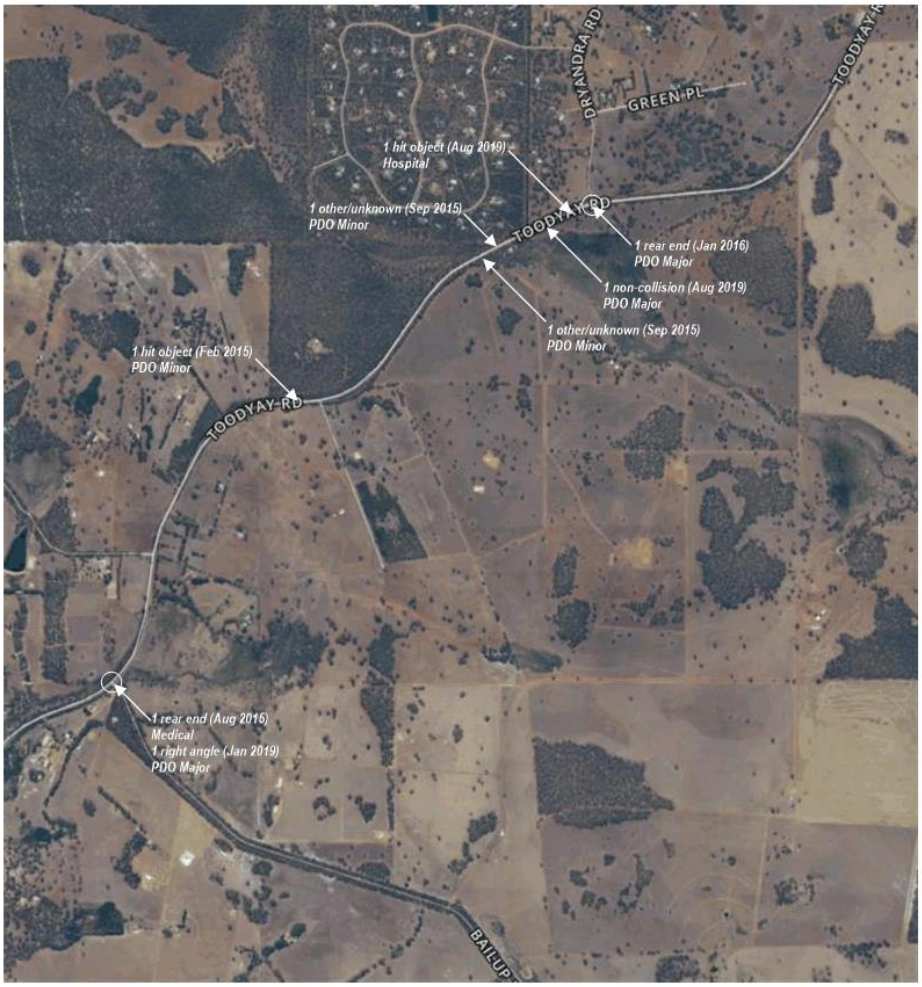


Figure 8: Toodyay Road Crash History – January 2015 to December 2019

The casualty crash rate for this section of road has been calculated based on the following ARRB formula:

$$Casualty\ Crash\ Rate = \frac{Number\ of\ Casualty\ Crash\ x\ 100{,}000{,}000}{AADT\ x\ 365\ x\ Number\ of\ Years\ of\ Data\ x\ Length\ of\ Roadway\ Segment}$$

The casualty crash rate is 10 crashes per 100 million vehicle-kilometres travelled. According to the ARRB Group *Casualty Crash Rates for Australian Jurisdictions (2008)*, the national weighted mean casualty crash rate for rural single carriageway roads is 16.26 crashes per 100 million vehicle-kilometres travelled.

3. Proposed Development

3.1. Land Use

The site is proposed to be developed as a quarry for extraction and delivery of basic raw materials. A site plan is shown in **Figure 9**.

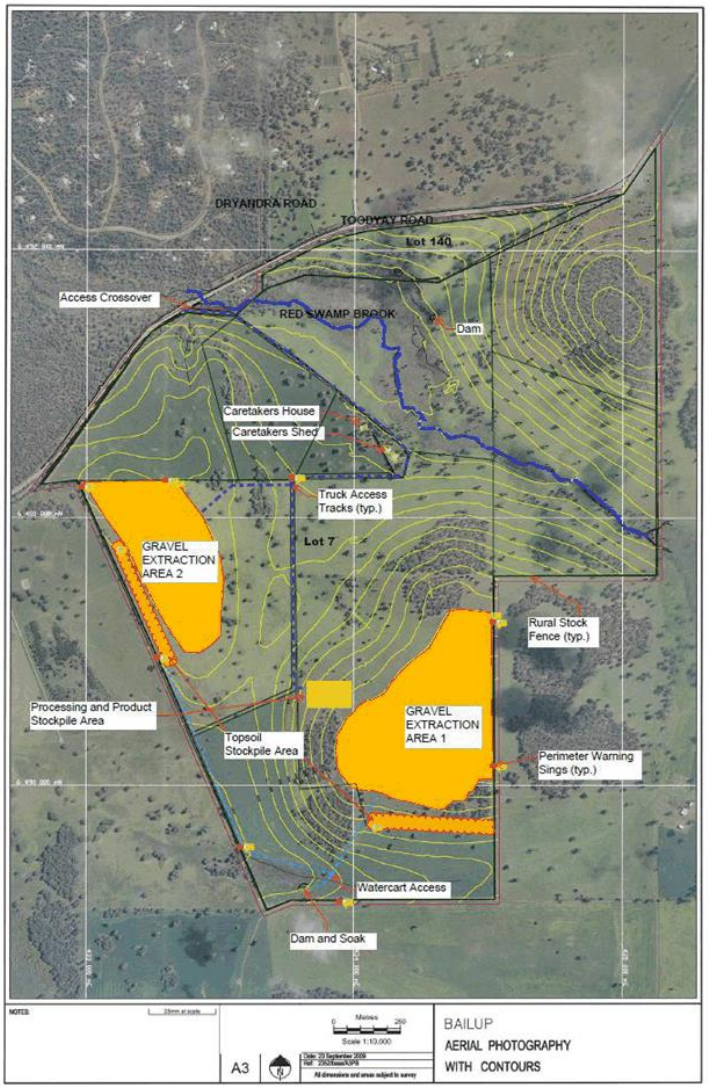


Figure 9: Proposed Site Plan

3.2. Operating Hours

The extraction is proposed to operate for at least 10 years starting from 2020/21. Delivery of raw materials will operate from 7:00 to 17:00, Monday to Saturday.

3.3. Proposed Haulage Vehicle

It is proposed to use Semi-trailers (**Figure 10**) and RAV 2 Truck and Dog Trailers (**Figure 11**) to transport raw material from the site with approximately 50% of each vehicle type used. The estimated carrying capacity for these trucks are 26 tonnes for semi-trailers and 41 tonnes for truck and dog trailers.

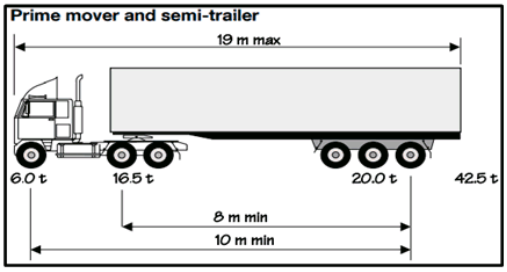


Figure 10: Typical Semi-Trailer Configuration

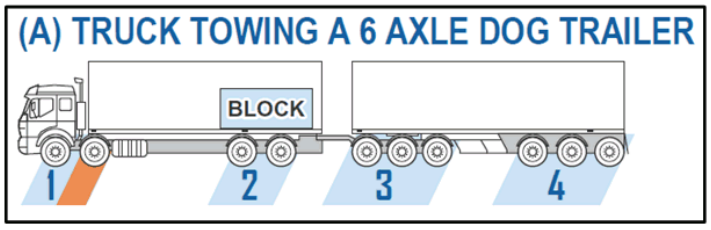


Figure 11: Typical Truck and Dog Trailer Configuration

3.4. Proposed Haulage Route

Based on the information provided, the extracted material will primarily be delivered to the Perth Coastal Plain areas (north and south). Approximately 5% of deliveries will be made towards the northeast along Toodyay Road using semi-trailers.

3.5. Proposed Traffic Volumes

Haulage from the site is expected to increase gradually from 150,000tpa in the first year (2020/21) to a maximum of 950,000tpa. The haulage volumes will depend on demand and it is considered unlikely that the 950,000tpa maximum would be reached. The client has estimated that the average annual tonnage would be 500,000tpa. The client is not proposing to not undertake campaigning at the site.

Based on a 150,000tpa and 950,000tpa transport demand, the traffic generation is calculated as shown in **Table 1** and

Table 2 respectively.

Table 1: Traffic Generation from the Development 2020/21 – 150,000tpa

Truck Type	%	Annual Haulage Amount by Truck Type (tpa)	Carrying Capacity or Payload (t)	Operating Days Per Year	Truck Movements Per Day	Operating Hours Per Day	Truck Movements Per Hour
Semi-Trailer	50%	75,000	26	312	18 (9 in/out)	10	2 (1 in/out)
Truck & Dog	50%	75,000	41	312	12 (6 in/out)	10	2 (1 in/out)
Total		150,000			30 (15 in/out)		4 (2 in/out)

Table 2: Traffic Generation from the Development 2030/31 – 950,000tpa

Truck Type	%	Annual Haulage Amount by Truck Type (tpa)	Carrying Capacity or Payload (t)	Operating Days Per Year	Truck Movements Per Day	Operating Hours Per Day	Truck Movements Per Hour
Semi-Trailer	50%	475,000	26	312	118 (59 in/out)	10	12 (6 in/out)
Truck & Dog	50%	475,000	41	312	74 (37 in/out)	10	8 (4 in/out)
Total		950,000			192 (96 in/out)		20 (10 in/out)

The proposed operations will also generate light vehicle movements from staff trips to site in the morning and from the site in the evening. Based on an estimated 6 onsite staff, the number of light vehicle trips is 12 trips per day. As the light vehicle movements are likely to occur outside of the peak periods of traffic on the road network, these have been excluded from the peak hour assessment.

As above, the proposed development is estimated to generate:

- 30 truck movements per day with 4 movements during the peak hours in the first year of operation (2020/21).
- Up to a maximum of 192 truck movements per day with 20 movements during the peak hours 10 years after opening (2030/31).

3.6. Proposed Access

Access to the site is proposed via an existing driveway on Toodyay Road at SLK12.50 (approx.) which will be upgraded to include turning treatments to suit the haulage vehicles. The layout of the access has been discussed with MRWA and an agreed concept layout has been provided by MRWA which is attached as **Appendix A** and discussed later in this assessment.

4. Transport Impact Assessment

4.1. Assessment Years

The development is assessed based on the year of operation, assumed to be 2020/21 as well as 10 years after opening (2030/31).

4.2. Time Periods for Assessment

The time periods adopted for assessment are the peak hours on the adjacent road network as these represent the peak combination of road network traffic and development traffic. Traffic data indicates that the weekday peak hours are from 6:45 to 7:45am and from 4:15 to 5:15pm and the weekend peak hours are from 10:15 to 11:15am and from 12:30 to 1:30pm.

4.3. Development Generation and Distribution

Based on the calculated traffic generation (shown previously in **Section 3.5**) and a 5% east (semi-trailer only) / 95% west split, a comparison between the pre-development and post-development traffic volumes is shown in **Table 3** and **Table 4**. As the majority of site traffic is heading towards the west and as the background traffic decreases towards the east, only Toodyay Road west of the site has been assessed.

Although traffic volumes along Toodyay Road have remained relatively stable, for the purpose of this assessment, it has been assumed conservatively that the background traffic will increase by 3% per year.

Table 3: Pre- and Post-Development Traffic Volumes - Weekday

Road	Time Period	2019/20 Volume	Projected 2020/21 Volume	Projected 2020/21 Volume with Development Traffic	Projected 2031/31 Volume	Projected 2030/31 Volume with Development Traffic
Toodyay Road West of Site Access	Daily (vpd)	2,841	2,926	2,956 (+30)	3,933	4,125 (+192)
	AM Peak (vph)	215	221	225 (+4)	298	318 (+20)
	PM Peak (vph)	237	244	248 (+4)	328	348 (+20)

Table 4: Pre- and Post-Development Traffic Volumes - Weekend

Road	Time Period	2019/20 Volume	Projected 2020/21 Volume	Projected 2020/21 Volume with Development Traffic	Projected 2031/31 Volume	Projected 2030/31 Volume with Development Traffic
Toodyay Road West of Site Access	Daily (vpd)	2,742	2,824	2,854 (+30)	3,796	3,988 (+192)
	AM Peak (vph)	263	271	275 (+4)	364	384 (+20)
	PM Peak (vph)	233	240	244 (+4)	323	343 (+20)

The daily and peak hour traffic volumes have been converted using passenger car equivalent (PCE) factors recommended by the MRWA *Standard RAV Route Assessment Guidelines* (RAV Guidelines). The PCE factors are shown in **Figure 12** and the converted volumes are shown in **Table 5**. The PCE factors for flat terrain were used.

Table 3: Passenger Car Equivalence Factors for RAVs

Vehicle Types		PCE Factors on Flat Terrain	PCE Factors on Rolling Terrain
Austroads Class 1		1	1.3
Austroads Class 2		1	1.3
Austroads Class 3 to 5		2	3.5
Austroads Class 6 to 9		2.5	5
Austroads Class 10	RAVs Categories 2-4	4	10
Austroads Class 11	RAVs Categories 5-8	4	10
Austroads Class 12	RAVs Categories 9-10	9	22

Figure 12: PCE Factors

Table 5: PCE Traffic Volumes – Post-development

Peak Period	2020/21 (vpd)	2020/21 (PCE)	2030/31 (vpd)	2030/31 (PCE)
Weekday Daily	2,956	3,579	4,125	5,417
Weekday AM Peak	225	227	318	432
Weekday PM Peak	248	304	348	468
Weekend Daily	2,854	3,167	3,988	4,864
Weekend AM Peak	275	308	384	473
Weekend PM Peak	244	275	343	429

4.4. Midblock Assessment

4.4.1. Capacity

Austroads *Guide to Traffic Management Part 3: Traffic Studies and Analysis* (AGTM03) provides the following advice on the typical mid-block lane capacity of different road types:

- Two-lane two-way rural roads and highways 1,700 passenger cars / hour
- Urban roads with interrupted flow 900 - 1,000 passenger cars / hour

The resulting traffic volumes as shown in **Table 5** are well within the mid-block capacity of the existing roads and so the proposed development traffic can be accommodated.

4.4.2. Road Cross Section

The required road cross sections according to the MRWA *Supplement to Austroads Guide to Road Design - Part 3* are shown in **Figure 13**.

Element	Design (PCUs / Day)			
	150 - 500	500 - 1000	1000 - 3000	3000 - 8000
Traffic Lanes[1]	7m (2 x 3.5m)	7m (2 x 3.5m)	7m (2 x 3.5m)	7m (2 x 3.5m)
Total Shoulder	1m	1.5m	1.5m or 2m	2m or 2.5m
Minimum Shoulder Seal[2][3][4][5]	1m	1.5m	1.5m or 2m	2m or 2.5m
Wide Centreline	N/A	N/A	None or 1m	None or 1m
Total Carriageway	9m	10m	11m	12m

Table 4.5: Single Carriageway Rural Road Widths

1. Traffic lane widths are measured from the centre of the relevant linemarking.

2. Where significant numbers of cyclists are expected to use the shoulders, consideration should be given to using a maximum size 10 mm seal within a 20 km radius of towns.

3. Wider shoulder seals may be appropriate depending on requirements for maintenance costs, soil and climatic conditions or to accommodate the tracked width requirements for Large Combination Vehicles.

4. Where verge barriers are installed, short lengths of wider shoulder seal or lay-bys may need to be provided at suitable locations to provide for discretionary stops in terms of Clause 6.3.5 of the Supplement to GRD Part 6.

5. Full width shoulder seals are required adjacent to safety barriers along unkerbed roads and may be appropriate on the high side of superelevation.

6. Design traffic comprises the traffic volume that is expected to be using the road at the end of the design period (generally 20 years) and includes passenger car equivalents for large vehicles. Passenger car equivalents for large vehicles in Table 4.5.1 are based upon work undertaken for the National Road Transport Commission.

7. A wide centreline treatment should be considered where there is a history of head-on crashes. Generally, this only occurs when traffic volumes exceed 5000 – 6000 PCUs / day.

Figure 13: Single Carriageway Rural Road Widths (MRWA)

Based on the predicted maximum daily traffic volume in **Table 5**, Toodyay Road should have an 11m to 12m wide carriageway consisting of two 3.5m wide traffic lanes and 2m to 2.5m wide shoulders. This is consistent with MRWA's intent for rural roads on the state network which suggests an 11m seal on 11 on 11m pavement for Toodyay Road for the 2031 horizon. The only difference is that a 0.6m to 1m wide centreline is also recommended for Toodyay Road.

The existing sealed width of Toodyay Road in the vicinity of the site is approximately 7.2m and there is a minimum of 2.0m unsealed shoulders on each side which does not fully meet the requirements due to the lack of a sealed shoulder.

The RAV Guidelines has also been referred to for advice on typical rural road widths. For roads carrying RAV2-4 vehicles with an AADT more than 1,000 vpd, the RAV Guidelines recommends a 7.1m wide seal. The existing cross-section of Toodyay Road in the vicinity of the site meets these requirements.

In this instance, a widening and sealing of the shoulders is not considered essential as the road is already approved for RAV2 vehicles and the requirements of the RAV guidelines are met.

4.5. Intersection Assessment

4.5.1. Intersection Capacity

The peak hour operation of proposed access has been modelled using SIDRA Intersection 8.0.

SIDRA is a commonly used intersection modelling tool used by traffic engineers for all types of intersections. Outputs for four standard measures of operational performance can be obtained, being Degree of Saturation (DoS), Average Delay, Queue Length, and Level of Service (LoS).

- Degree of Saturation is a measure of how much physical capacity is being used with reference to the full capability of the particular movement, approach, or overall intersection. A DoS of 1.0 equates to full theoretical capacity although in some instances this level is exceeded in practice. SIDRA uses maximum acceptable DoS of 0.90 for signalised intersections for its Design Life analysis. Design engineers typically set a maximum DoS threshold of 0.95 for new intersection layouts or modifications.
- Average Delay reports the average delay per vehicle in seconds experienced by all vehicles in a particular lane, approach, or for the intersection as a whole. For severely congested intersections the average delay begins to climb exponentially.
- Queue Length measures the length of approach queues. In this document we have reported queue length in terms of the length of queue at the 95th percentile (the maximum queue length that will not be exceeded for 95 percent of the time). Queue lengths provide a useful indication of the impact of signals on network performance. It also enables the traffic engineer to consider the likely impact of queues blocking back and impacting on upstream intersections and accesses.
- Level of Service is a combined appreciation of queuing incidence and delay time incurred, producing an alphanumeric ranking of A through F. A LoS of A indicates an excellent level of service whereby drivers delay is at a minimum and they clear the intersection at each change of signals or soon after arrival with little if any queuing. Values of B through D are acceptable in normal traffic conditions. Whilst values of E and F are typically considered undesirable, within central business district areas with significant vehicular and pedestrian numbers, corresponding delays/queues are unavoidable and hence, are generally accepted by road users.

The following key assumptions were made as agreed with MRWA:

- Peak hour traffic flows through the site access were based on the projected traffic volumes on Toodyay Road and the estimated site generated traffic volumes. Only the 2030/2031 scenario has been assessed as this represents the worst case scenario.
- Gap acceptance parameters were based on the default SIDRA values.

- Heavy vehicle parameters (vehicle length, PCE, mass and maximum power) were as outlined in the MRWA *Operational Modelling Guidelines*.
- The existing farming activities on the site would generate minimal traffic and so it is estimated that the current use generates 1vph for each turning movement during peak periods.
- The access geometry has been based on the agreed layout provided by MRWA.

The results of the SIDRA assessment are included as **Appendix B** and are summarised in **Table 6**.

Table 6: 2030/31 SIDRA Results Summary

Scenario	Average DoS	Maximum Queue (m)	Average Delay (s)	Worst Delay (s)	Average LoS	Worst LoS
Weekday AM Peak – Pre-Development	0.130	0.1m	0.1s	7.8s	A	A
Weekday AM Peak – Post-Development	0.132	2.4m	0.8s	15.9s	A/B	C
Weekday PM Peak – Pre-Development	0.129	0.1m	0.1s	8.0s	A	A
Weekday PM Peak – Post-Development	0.129	6.5m	1.4s	21.2s	B	C
Weekend AM Peak – Pre-Development	0.110	0.1m	0.1s	8.3s	A	A
Weekend AM Peak – Post-Development	0.111	2.3m	0.7s	15.1s	A/B	C
Weekend PM Peak – Pre-Development	0.094	0.1m	0.1s	8.2s	A	A
Weekend PM Peak – Post-Development	0.096	2.2m	0.7s	14.4s	A	B

The results of the analysis indicate that under the 2030/31 maximum haulage scenario, the proposed access will operate within capacity with all measures of performance within acceptable values.

4.5.2. Acceleration Lanes

The RAV guidelines provides the following advice with regards to acceleration lanes:

> *To assist in ensuring network performance levels are maintained, the assessor needs to identify if the acceleration lanes and turn pockets are present at intersections and the length of these treatments. Capturing this information in the assessment will assist in determining if network improvements are necessary, in consultation with the road manager.*

AGRD04 notes that:

> *There are no simple numerical warrants for the provision of acceleration lanes. However, an auxiliary lane may be added on the departure side of a left turn or right turn if traffic is unable to join safely and/or efficiently with the adjacent through traffic flow by selecting a gap in the traffic stream.*
>
> *Acceleration lanes may be provided at major intersections depending on traffic analysis. However, they are usually provided only where:*

- *insufficient gaps exist for vehicles to enter a traffic stream.*
- *turning volumes are high (e.g. > 300 vph).*
- *the observation angle falls below the requirements of the minimum gap sight distance model (for example, inside of horizontal curves).*
- *heavy vehicles pulling into the traffic stream would cause excessive slowing of major road vehicles.*

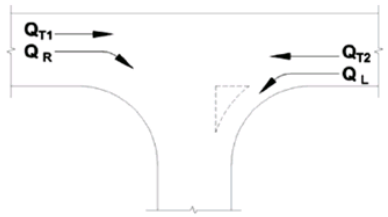
The previous RAV guidelines provided more specific numerical warrants for the provision of acceleration lanes and the previous assessment based on these guidelines concluded that an acceleration lane was required. After several discussions with MRWA, it has been agreed that a 600m acceleration lane (including taper) will be required. This is indicated on the accepted concept access layout included as **Appendix A**.

4.5.3. Auxiliary Lanes

The warrants for provision of auxiliary lanes at the access points were assessed in accordance with MRWA *Intersection Warrants* spreadsheet which was adopted from Austroads guidelines. The through and turning volumes were calculated as per **Figure 14** and the results of the assessment are shown in **Table 7**. This assessment is based on the 2030/31 scenario which represents the peak haulage movements from the development. The background traffic volumes were factored up by 3% to account for general traffic growth and the turning movements were derived from the traffic generation exercise.

Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings

Figure 2.27: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	$= Q_{T1} + Q_{T2} + Q_L$
		Yes	$= Q_{T1} + Q_{T2}$
	Left	Yes or no	$= Q_{T2}$
Four-lane two-way	Right	No	$= 50\% \times Q_{T1} + Q_{T2} + Q_L$
		Yes	$= 50\% \times Q_{T1} + Q_{T2}$
	Left	Yes or no	$= 50\% \times Q_{T2}$
Six-lane two-way	Right	No	$= 33\% \times Q_{T1} + Q_{T2} + Q_L$
		Yes	$= 33\% \times Q_{T1} + Q_{T2}$
	Left	Yes or no	$= 33\% \times Q_{T2}$

Source: TMR (2016a).

Figure 14: Calculation of the Major Road Traffic Volume Q_m

Table 7: Major Road Turning and Through Volumes at Intersection – 2030/31

Peak Hour	Q_{T1}	Q_{T1} HV%	Q_{T2}	Q_{T2} HV%	Direction	Q_R or Q_L	Q_R or Q_L HV%	Treatment
Weekday AM Peak	86	12.9%	212	20.3%	Left	1	100%	BAL
					Right	10	100%	AUR
Weekday PM Peak	210	7.9%	114	20.7%	Left	1	100%	BAL
					Right	10	100%	AUR
Weekend AM Peak	165	4.2%	199	11.1%	Left	1	100%	BAL
					Right	10	100%	AUR
Weekend PM Peak	158	2.6%	169	11.5%	Left	1	100%	BAL
					Right	10	100%	AUR

As per **Table 9**, the traffic flows at the proposed access warrant the provision of a basic left (BAL) turn treatment and an auxiliary right (AUR) turn treatment. It has been agreed that a channelised right (CHR) turn treatment is implemented at the proposed access instead of the warranted AUR treatment due to the restricted sight distance towards the west along the curve.

Additionally, the access will need to be design to accommodate the swept path of RAV 2 vehicles to the west and Semi-trailers to the east. A swept path assessment on the approved MRWA concept has been undertaken in Autodesk Vehicle Tracking which indicates that the intersection geometry is adequate. The swept paths are attached as **Appendix C**.

4.5.4. Safe Intersection Sight Distance

The Safe Intersection Sight Distance (SISD) is the minimum distance which should be provided on the major road at any intersection. SISD provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes) and to decelerate to a stop before reaching the collision point.

The Safe Intersection Sight Distance (SISD) has been assessed in accordance with Austroads Guide to Road Design Part 4A (AGRD04A) and the RAV Guidelines as detailed in **Table 8**. The approach grade is approximately 2.8% downgrade from the southwest to northeast. A reaction time of 2.5s has been adopted for both light vehicles and heavy vehicles.

Deceleration coefficients for each vehicle type for the purpose of sight distance calculations are as follows:

- Light Vehicles: 0.362; and
- Heavy Vehicles: 0.24.

The SISD is measured from the driver's eye height to the top of the opposing vehicle.

Table 8: SISD at Site Access

Vehicle Type	Design Speed (km/h)	Coefficient of Deceleration	Decision Time (s)	Longitudinal Grade	Required SSD from Southwest / Northeast (m)	Available SISD (m)	
						Southwest	Northeast
Trucks	100	0.29	3+2.5	-2.8%/0.5%	351 / 338	250	500+
Cars	110	0.36	3+2.5	-2.8%/0.5%	313 / 300	250	500+

As shown, the currently available SISD from the southwest approach is not sufficient due to vegetation on the inside of the curve. The required SISD will be achieved through clearing of vegetation and cutting back the batter inside the curve.

The previous sight distance drawings are attached as **Appendix D**. Although these drawings do not show the proposed acceleration lane, they indicate that the required SISD towards the southwest can be achieved within the road reserve with the appropriate clearing and modification of the batters. The drawings also show that required SISD is also achieved towards the northeast.

4.5.5. Entering Sight Distance

Entering Sight Distance (ESD) is the sight distance that drivers require when undertaking a crossing or turning manoeuvre at intersections. This sight distance is dependent of the gradient of the road at the intersection and the size, weight and acceleration of the vehicle.

The required and available ESD has been determined from Appendix F of the RAV Guidelines and the results are summarised in **Table 9**.

The ESD is measured from the driver's eye height to the top of the opposing vehicle.

Table 9: ESD at Site Access

Vehicle Type	Direction	Design Speed (km/h)	Approach Grade	Required ESD	Available ESD
Heavy Vehicle (RAV Categories 2-4)	Southwest	100	2.8% Downgrade	323	250
Heavy Vehicle (RAV Categories 2-4)	Northeast	100	0.5% Upgrade	305	500+

As shown, the required ESD is achieved towards the northeast but not towards the southwest. The shortfall in ESD will be achieved through the proposed vegetation clearing and modification of the batters as per the drawings in **Appendix D**.

5. Site Specific Issues

5.1. Road Safety

The crash history of the adjacent road network does not indicate any particular safety issues.

However, to maximise safety, 'Truck Entering' signs (W5-22 as shown in **Figure 15**) or other similar warning signage should be placed on the western approach to the access. The erection of advanced warning 'Trucks Entering' signage is also one of conditions of the current approval (haulage of 47,000tpa from the site).

Figure 15: Recommended Trucks Entering Warning Sign

MRWA have requested that 'flag' lighting is included at the intersection. Considering that the site will only operate during the daytime, lighting at the intersection is not considered necessary.

5.2. School Bus Traffic on Toodyay Road

It is understood that there are community concerns of the proposed haulage activities affecting school bus routes that operate along Toodyay Road. Although the exact school bus route and location of school are unknown at the current stage, the operation of school buses is unlikely to be affected based on the following reasons:

- Toodyay Road is a designated heavy haulage route road and school bus drivers are aware of heavy vehicles operating along Toodyay Road.
- The proposed haulage route does not use any local roads.
- The nearest accesses to rural-residential properties from Toodyay Road are Dryandra Road and Morangup Road which are not part of the proposed haulage route. The intersections are located east of Site Access / Toodyay Road intersection. The proposed traffic distribution only indicates less than 5% truck traffic going east.

6. Conclusions

A Transport Impact Assessment for the proposed raw material extraction and haualge from Lot 556 Toodyay Road, Bailup concluded the following:

- The estimated site traffic generation during first year of operation and 10 years after operation can be accommodated within the capacity of the existing road network at mid-block and intersection locations.
- It has been agreed with MRWA that an acceleration lane is required for vehicles exiting the site towards the south-west.
- The proposed haulage volumes warrant the provision of a Basic Left (BAL) and an Auxiliary Right (AUR) turn treatment at the site access. It is recommended and agreed that a Channelised Right (CHR) turn treatment is provided instead of the AUR to improve safety.
- Toodyay Road is already on the Tandem-Drive 4.1 Network and therefore no further upgrades required.
- The required SISD and ESD is achieved towards the northeast but is not achieved towards the southwest due to vegetation inside the curve within the road reserve. It is proposed to increase the sight distance to meet the minimum requirements by clearing the vegetation and modifying the batter.
- The additional traffic generated by the site is not considered to increase the likelihood of crashes to unacceptable levels and is unlikely to severely affect the operation of school buses operating along Toodyay Road. It has been recommended that warning signage is placed on approach to the access. Although MRWA have requested that 'flag' lighting is provided at the intersection, this is not considered necessary as the site will only operate during the daytime.

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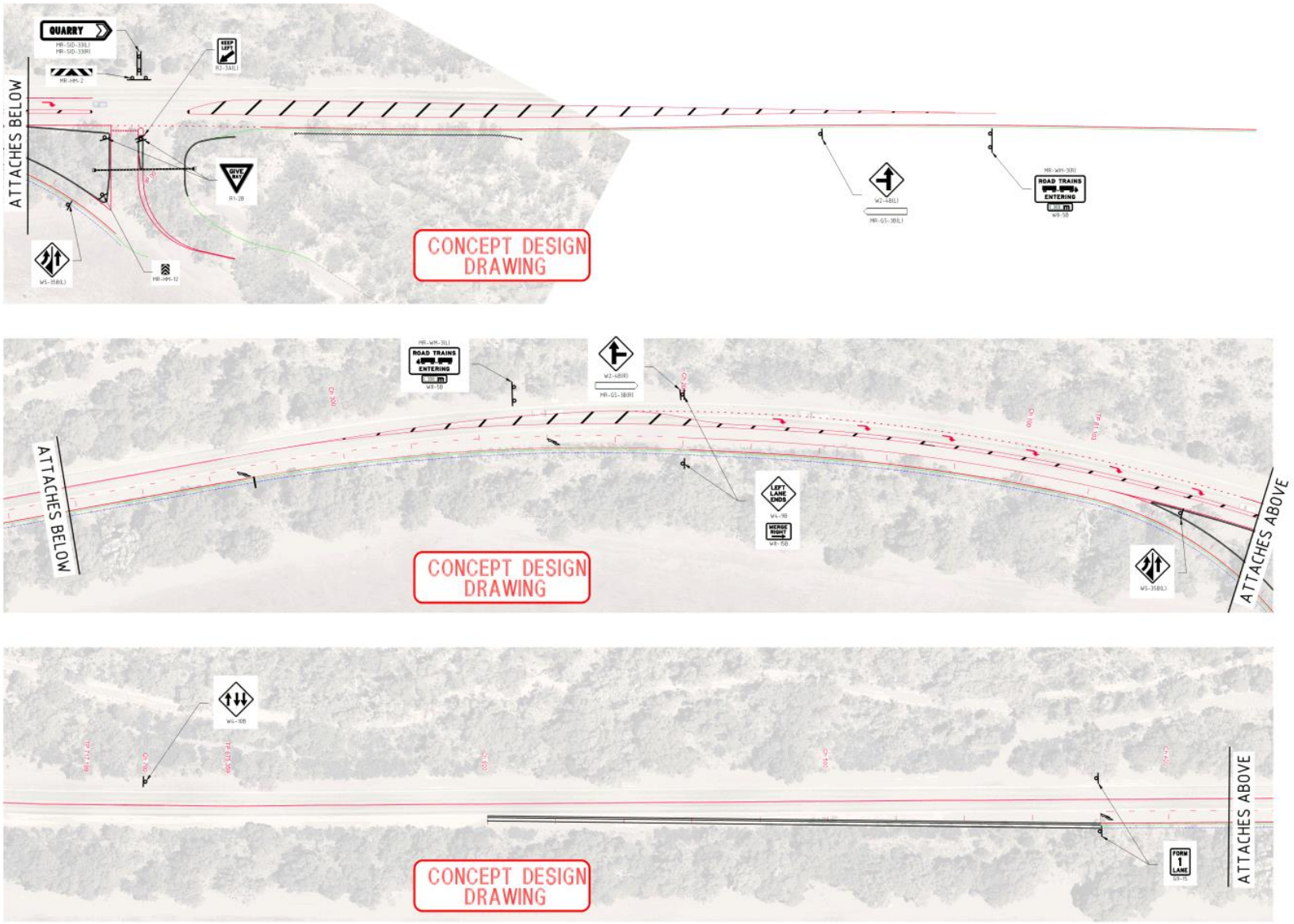
Appendix A – MRWA Approved Site Access Layout


QUARRY
KEEP LEFT
GIVE WAY
ROAD TRAINS ENTERING
ATTACHES BELOW
CONCEPT DESIGN DRAWING
ROAD TRAINS ENTERING
LEFT LANE ENDS
MERGE RIGHT
ATTACHES BELOW
ATTACHES ABOVE
CONCEPT DESIGN DRAWING
FORM 1 LANE
ATTACHES ABOVE
CONCEPT DESIGN DRAWING

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Appendix B – SIDRA Outputs

MOVEMENT SUMMARY

▽ Site: 1 [2030/31 Weekday AM Peak - Pre-development]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	1	0.0	0.002	2.8	LOS A	0.0	0.1	0.40	0.27	0.40	42.0
3	R2	1	0.0	0.002	4.5	LOS A	0.0	0.1	0.40	0.27	0.40	41.5
Approach		2	0.0	0.002	3.6	NA	0.0	0.1	0.40	0.27	0.40	41.7
NorthEast: Toodyay Road												
4	L2	1	0.0	0.130	7.8	LOS A	0.0	0.0	0.00	0.00	0.00	88.5
5	T1	212	14.2	0.130	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
Approach		213	14.1	0.130	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.7
SouthWest: Toodyay Road												
11	T1	85	12.9	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	1	0.0	0.001	8.4	LOS A	0.0	0.0	0.33	0.56	0.33	42.3
Approach		86	12.8	0.051	0.1	NA	0.0	0.0	0.00	0.01	0.00	98.4
All Vehicles		301	13.6	0.130	0.1	NA	0.0	0.1	0.00	0.01	0.00	98.4

MOVEMENT SUMMARY

▽ Site: 1 [2030/31 Weekday AM Peak - Post-development]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	11	90.9	0.026	3.3	LOS A	0.1	1.3	0.21	0.22	0.21	31.9
3	R2	2	50.0	0.026	11.2	LOS B	0.1	1.3	0.21	0.22	0.21	34.1
Approach		13	84.6	0.026	4.5	NA	0.1	1.3	0.21	0.22	0.21	32.3
NorthEast: Toodyay Road												
4	L2	2	50.0	0.132	9.3	LOS A	0.0	0.0	0.00	0.01	0.00	65.6
5	T1	212	14.2	0.132	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.8
Approach		214	14.5	0.132	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.3
SouthWest: Toodyay Road												
11	T1	85	12.9	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	11	90.9	0.025	15.9	LOS C	0.1	2.4	0.51	0.69	0.51	40.4
Approach		96	21.9	0.051	1.8	NA	0.1	2.4	0.06	0.08	0.06	85.5
All Vehicles		323	19.5	0.132	0.8	NA	0.1	2.4	0.03	0.04	0.03	87.7

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MOVEMENT SUMMARY

▽ Site: 1 [2030/31 Weekday PM Peak - Pre-development]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	1	0.0	0.002	3.0	LOS A	0.0	0.1	0.41	0.27	0.41	41.9
3	R2	1	0.0	0.002	4.7	LOS A	0.0	0.1	0.41	0.27	0.41	41.4
Approach		2	0.0	0.002	3.8	NA	0.0	0.1	0.41	0.27	0.41	41.7
NorthEast: Toodyay Road												
4	L2	1	0.0	0.065	7.8	LOS A	0.0	0.0	0.00	0.01	0.00	88.4
5	T1	110	11.8	0.065	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.7
Approach		111	11.7	0.065	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.6
SouthWest: Toodyay Road												
11	T1	211	14.2	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
12	R2	1	0.0	0.001	8.0	LOS A	0.0	0.0	0.22	0.58	0.22	42.5
Approach		212	14.2	0.129	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.3
All Vehicles		325	13.2	0.129	0.1	NA	0.0	0.1	0.00	0.01	0.00	98.6

MOVEMENT SUMMARY

▽ Site: 1 [2030/31 Weekday PM Peak - Post-development]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	11	90.9	0.055	14.2	LOS B	0.3	6.5	0.55	0.37	0.55	29.1
3	R2	6	83.3	0.055	21.2	LOS C	0.3	6.5	0.55	0.37	0.55	28.1
Approach		17	88.2	0.055	16.7	NA	0.3	6.5	0.55	0.37	0.55	28.7
NorthEast: Toodyay Road												
4	L2	6	83.3	0.073	10.3	LOS B	0.0	0.0	0.00	0.03	0.00	55.9
5	T1	110	11.8	0.073	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	99.7
Approach		116	15.5	0.073	0.5	NA	0.0	0.0	0.00	0.03	0.00	95.8
SouthWest: Toodyay Road												
11	T1	211	14.2	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
12	R2	11	90.9	0.020	13.6	LOS B	0.1	2.0	0.40	0.63	0.40	41.5
Approach		222	18.0	0.129	0.7	NA	0.1	2.0	0.02	0.03	0.02	93.4
All Vehicles		355	20.6	0.129	1.4	NA	0.3	6.5	0.04	0.05	0.04	84.9

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MOVEMENT SUMMARY

▽ Site: 1 [2030/31 Weekend AM Peak - Pre-development]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	1	0.0	0.002	3.2	LOS A	0.0	0.1	0.43	0.27	0.43	41.8
3	R2	1	0.0	0.002	4.9	LOS A	0.0	0.1	0.43	0.27	0.43	41.3
Approach		2	0.0	0.002	4.0	NA	0.0	0.1	0.43	0.27	0.43	41.6
NorthEast: Toodyay Road												
4	L2	1	0.0	0.110	7.8	LOS A	0.0	0.0	0.00	0.00	0.00	88.5
5	T1	199	6.5	0.110	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
Approach		200	6.5	0.110	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.8
SouthWest: Toodyay Road												
11	T1	166	7.2	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	1	0.0	0.001	8.3	LOS A	0.0	0.0	0.30	0.56	0.30	42.4
Approach		167	7.2	0.092	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.1
All Vehicles		369	6.8	0.110	0.1	NA	0.0	0.1	0.00	0.00	0.00	98.7

MOVEMENT SUMMARY

▽ Site: 1 [2030/31 Weekend AM Peak - Post-development]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	11	90.9	0.026	4.0	LOS A	0.1	1.5	0.23	0.23	0.23	31.7
3	R2	2	50.0	0.026	13.2	LOS B	0.1	1.5	0.23	0.23	0.23	33.8
Approach		13	84.6	0.026	5.4	NA	0.1	1.5	0.23	0.23	0.23	32.0
NorthEast: Toodyay Road												
4	L2	2	50.0	0.111	9.3	LOS A	0.0	0.0	0.00	0.01	0.00	66.3
5	T1	199	6.5	0.111	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.8
Approach		201	7.0	0.111	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.3
SouthWest: Toodyay Road												
11	T1	166	7.2	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	11	90.9	0.023	15.1	LOS C	0.1	2.3	0.48	0.67	0.48	40.8
Approach		177	12.4	0.092	0.9	NA	0.1	2.3	0.03	0.04	0.03	91.7
All Vehicles		391	12.0	0.111	0.7	NA	0.1	2.3	0.02	0.03	0.02	89.6

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MOVEMENT SUMMARY

▽ Site: 1 [2030/31 Weekend PM Peak - Pre-development]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	1	0.0	0.002	2.9	LOS A	0.0	0.1	0.40	0.27	0.40	42.0
3	R2	1	0.0	0.002	4.5	LOS A	0.0	0.1	0.40	0.27	0.40	41.4
Approach		2	0.0	0.002	3.7	NA	0.0	0.1	0.40	0.27	0.40	41.7
NorthEast: Toodyay Road												
4	L2	1	0.0	0.094	7.8	LOS A	0.0	0.0	0.00	0.00	0.00	88.5
5	T1	169	7.1	0.094	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
Approach		170	7.1	0.094	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.7
SouthWest: Toodyay Road												
11	T1	159	6.9	0.088	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	1	0.0	0.001	8.2	LOS A	0.0	0.0	0.28	0.57	0.28	42.4
Approach		160	6.9	0.088	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.1
All Vehicles		332	6.9	0.094	0.1	NA	0.0	0.1	0.00	0.01	0.00	98.6

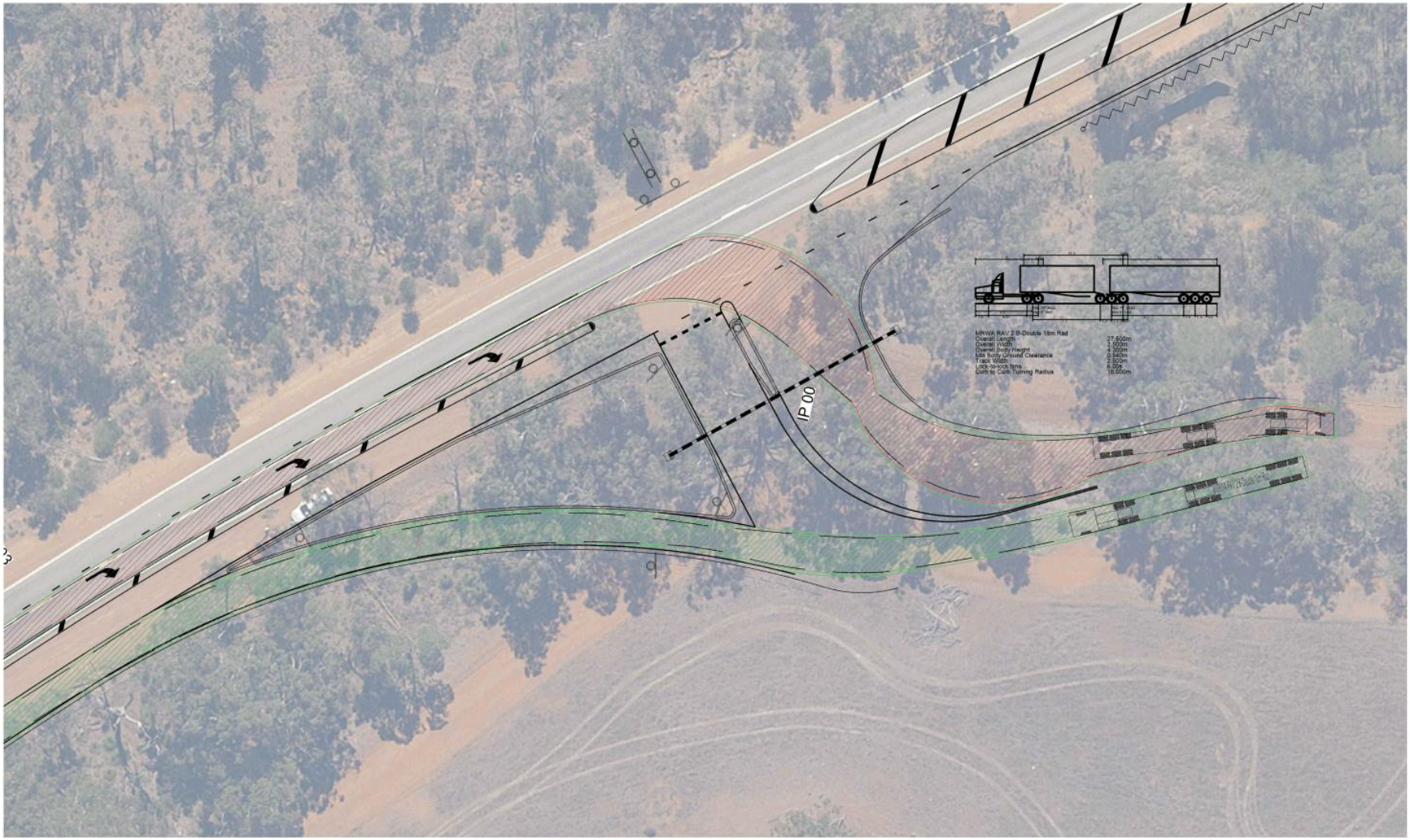
MOVEMENT SUMMARY

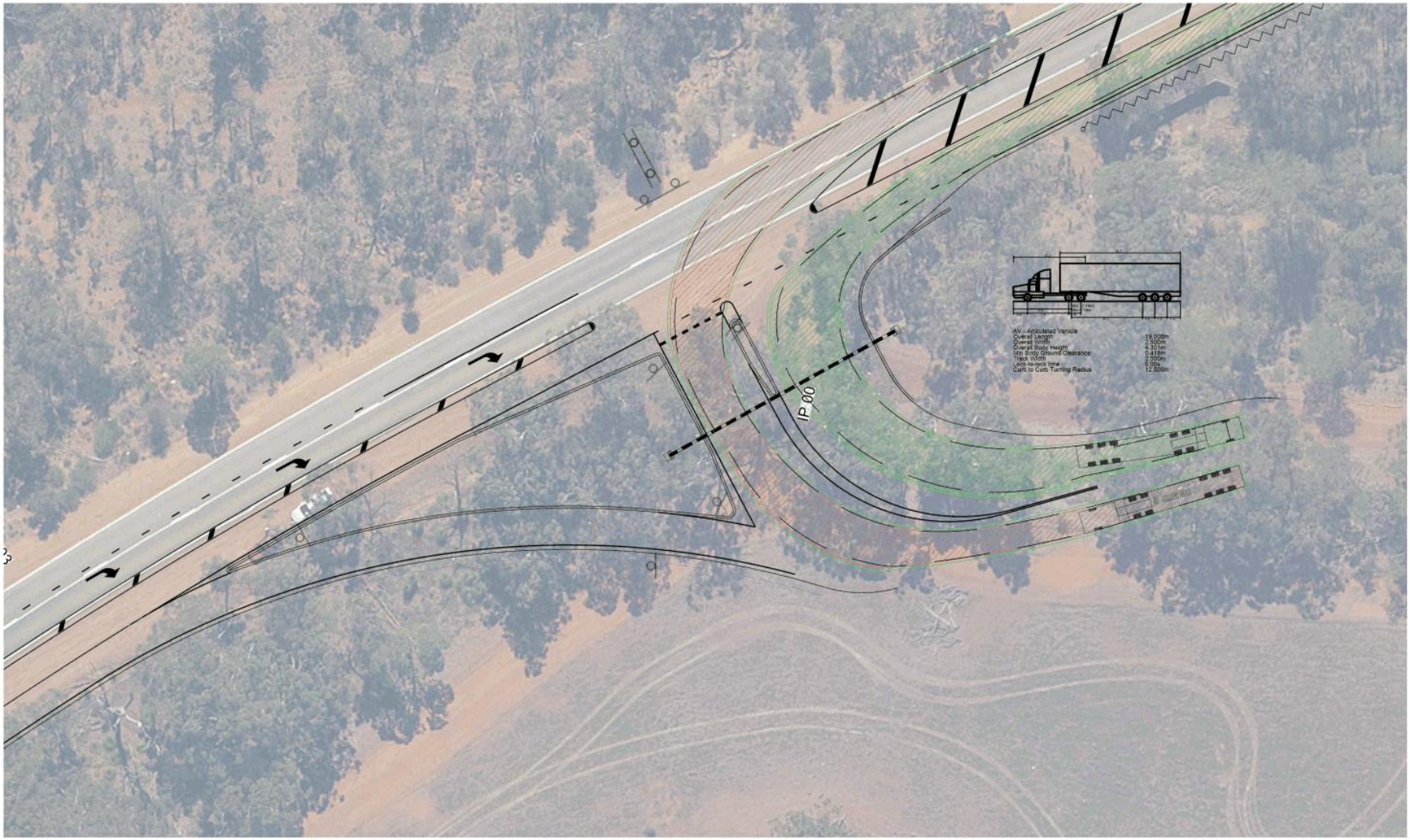
▽ Site: 1 [2030/31 Weekend PM Peak - Post-development]

Site Category: -
Giveway / Yield (Two-Way)

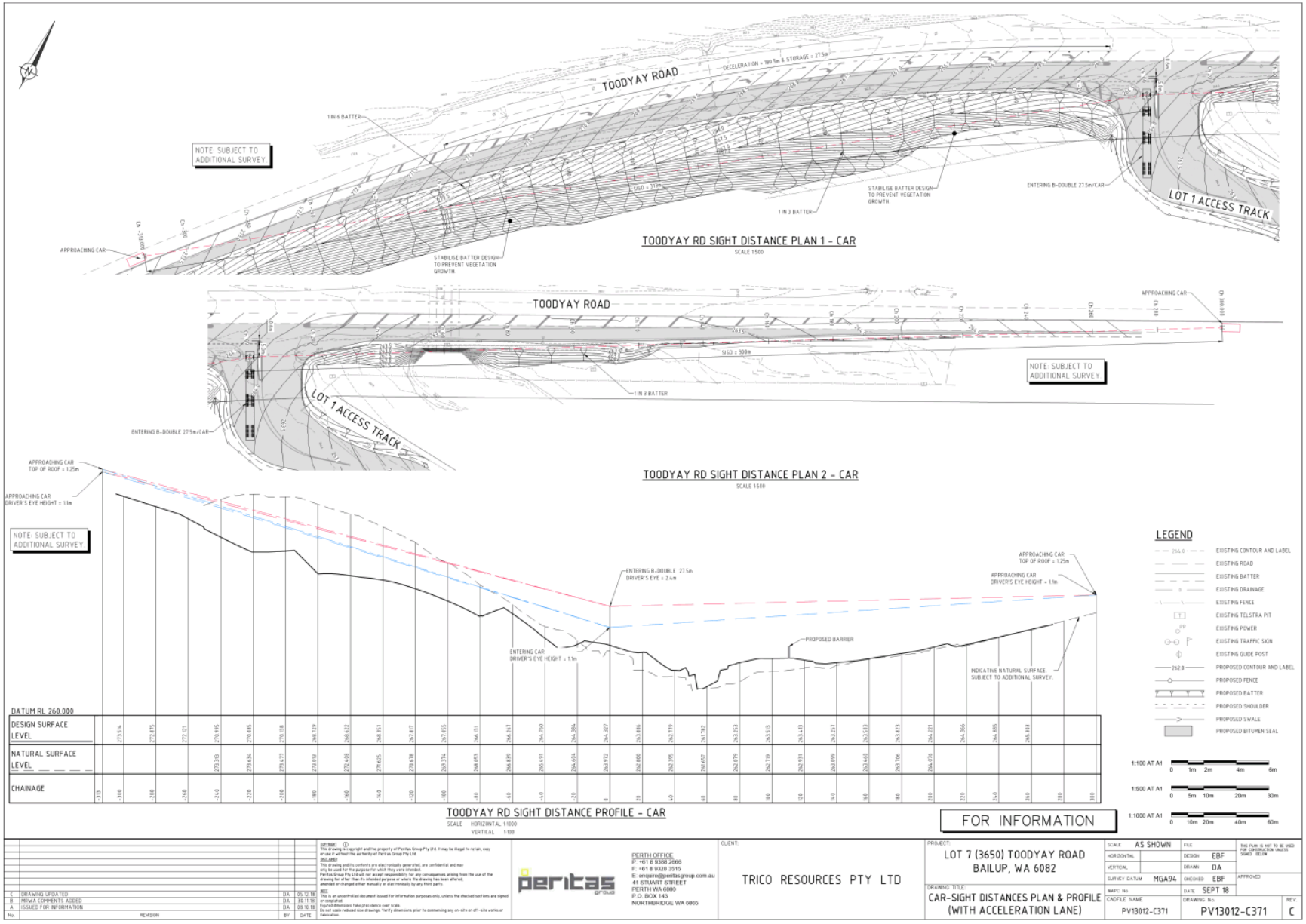
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Site Access												
1	L2	11	90.9	0.026	3.4	LOS A	0.1	1.4	0.21	0.22	0.21	31.9
3	R2	2	50.0	0.026	11.6	LOS B	0.1	1.4	0.21	0.22	0.21	34.1
Approach		13	84.6	0.026	4.7	NA	0.1	1.4	0.21	0.22	0.21	32.2
NorthEast: Toodyay Road												
4	L2	2	50.0	0.096	9.3	LOS A	0.0	0.0	0.00	0.01	0.00	66.2
5	T1	169	7.1	0.096	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.8
Approach		171	7.6	0.096	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.2
SouthWest: Toodyay Road												
11	T1	159	6.9	0.088	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	11	90.9	0.021	14.4	LOS B	0.1	2.2	0.45	0.66	0.45	41.1
Approach		170	12.4	0.088	0.9	NA	0.1	2.2	0.03	0.04	0.03	91.5
All Vehicles		354	12.7	0.096	0.7	NA	0.1	2.2	0.02	0.03	0.02	88.8

Appendix C – Swept Path Diagrams


IP 00
MRWA RAV 2 B-Double 19m Rad
Overall Length 27.600m
Overall Width 3.550m
Overall Body Height 4.300m
Min Body Ground Clearance 0.540m
Track Width 2.500m
Lock-to-lock time 6.90s
Kerb to Kerb Turning Radius 18.000m


IP 00
AV - Articulated Vehicle
Overal Length 19.000m
Overal Width 2.500m
Overal Body Height 4.301m
Min Body Ground Clearance 0.418m
Track Width 2.500m
Lock-to-lock time 9.00s
Curb to Curb Turning Radius 12.500m

Appendix D – Sight Distance Drawings


TOODYAY ROAD
NOTE: SUBJECT TO ADDITIONAL SURVEY
LOT 1 ACCESS TRACK
TOODYAY RD SIGHT DISTANCE PLAN 1 - CAR
SCALE 1:500
TOODYAY ROAD
LOT 1 ACCESS TRACK
NOTE: SUBJECT TO ADDITIONAL SURVEY
TOODYAY RD SIGHT DISTANCE PLAN 2 - CAR
SCALE 1:500
NOTE: SUBJECT TO ADDITIONAL SURVEY
DATUM RL 260.000
DESIGN SURFACE LEVEL
NATURAL SURFACE LEVEL
CHAINAGE
TOODYAY RD SIGHT DISTANCE PROFILE - CAR
SCALE HORIZONTAL 1:1000
VERTICAL 1:100
FOR INFORMATION
LEGEND
EXISTING CONTOUR AND LABEL
EXISTING ROAD
EXISTING BATTER
EXISTING DRAINAGE
EXISTING FENCE
EXISTING TELSTRA PIT
EXISTING POWER
EXISTING TRAFFIC SIGN
EXISTING GUIDE POST
PROPOSED CONTOUR AND LABEL
PROPOSED FENCE
PROPOSED BATTER
PROPOSED SHOULDER
PROPOSED SWALE
PROPOSED BITUMEN SEAL
1:100 AT A1
1:500 AT A1
1:1000 AT A1
C DRAWING UPDATED DA 05.12.18
B MRWA COMMENTS ADDED DA 30.11.18
A ISSUED FOR INFORMATION DA 09.10.18
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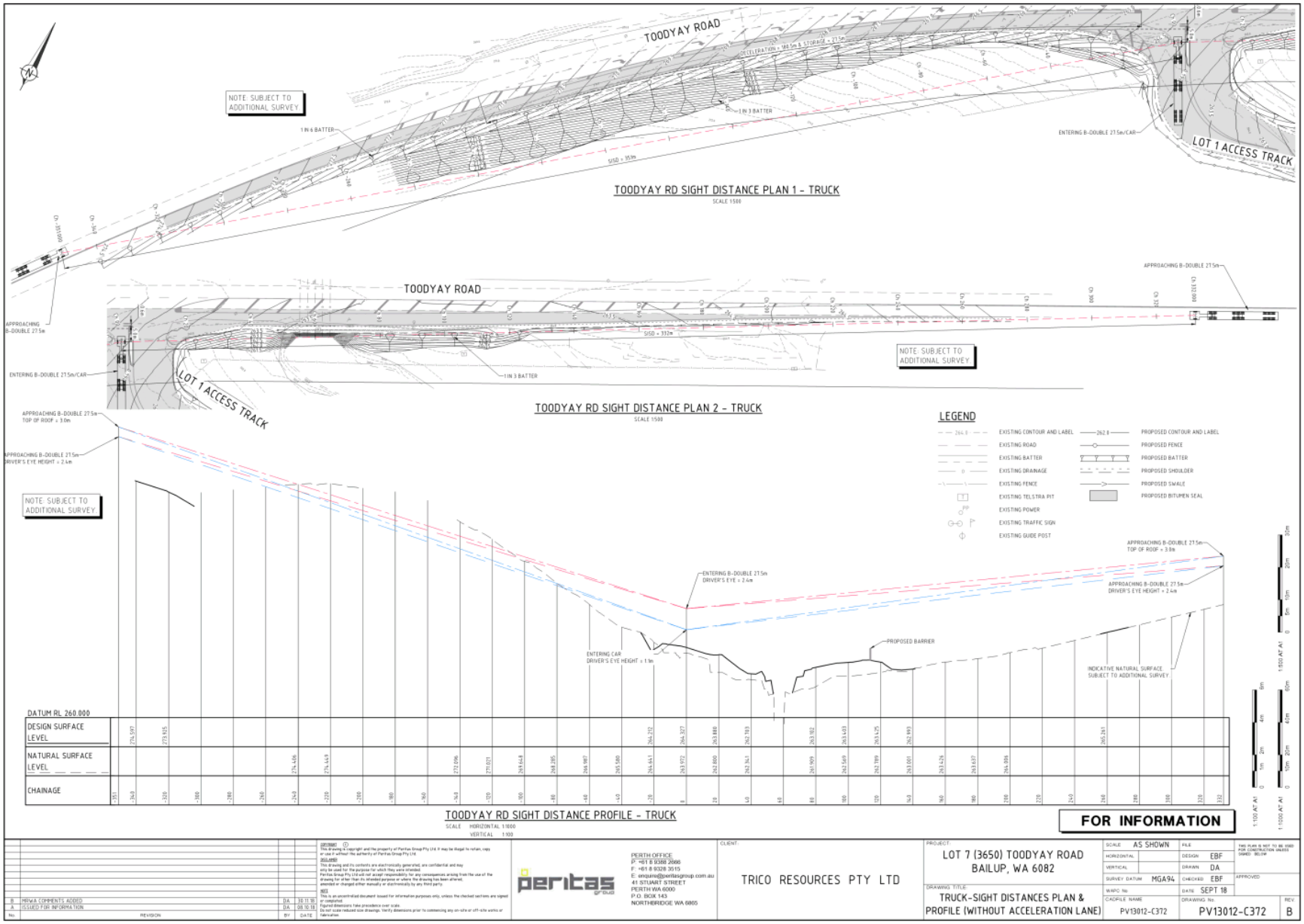
F: +61 8 9328 3515
E: enquiries@peritasgroup.com.au
41 STUART STREET
PERTH WA 6000
P.O. BOX 143
NORTHBRIDGE WA 6865
CLIENT: TRICO RESOURCES PTY LTD
PROJECT: LOT 7 (3650) TOODYAY ROAD BAILUP, WA 6082
DRAWING TITLE: CAR-SIGHT DISTANCES PLAN & PROFILE (WITH ACCELERATION LANE)
SCALE AS SHOWN
HORIZONTAL
VERTICAL
SURVEY DATUM MGA94
WAPC No
CADFILE NAME PV13012-C371
DESIGN EBF
DRAWN DA
CHECKED EBF
DATE SEPT 18
DRAWING No. PV13012-C371
REV C


TOODYAY ROAD
NOTE: SUBJECT TO ADDITIONAL SURVEY
1 IN 6 BATTER
1 IN 3 BATTER
ENTERING B-DOUBLE 27.5m/CAR
LOT 1 ACCESS TRACK
SISD = 359m
TOODYAY RD SIGHT DISTANCE PLAN 1 - TRUCK
SCALE 1:500
TOODYAY ROAD
APPROACHING B-DOUBLE 27.5m
APPROACHING B-DOUBLE 27.5m
ENTERING B-DOUBLE 27.5m/CAR
LOT 1 ACCESS TRACK
1 IN 3 BATTER
SISD = 332m
NOTE: SUBJECT TO ADDITIONAL SURVEY
TOODYAY RD SIGHT DISTANCE PLAN 2 - TRUCK
SCALE 1:500
LEGEND
EXISTING CONTOUR AND LABEL
EXISTING ROAD
EXISTING BATTER
EXISTING DRAINAGE
EXISTING FENCE
EXISTING TELSTRA PIT
EXISTING POWER
EXISTING TRAFFIC SIGN
EXISTING GUIDE POST
PROPOSED CONTOUR AND LABEL
PROPOSED FENCE
PROPOSED BATTER
PROPOSED SHOULDER
PROPOSED SWALE
PROPOSED BITUMEN SEAL
APPROACHING B-DOUBLE 27.5m TOP OF ROOF = 3.0m
APPROACHING B-DOUBLE 27.5m DRIVER'S EYE HEIGHT = 2.4m
NOTE: SUBJECT TO ADDITIONAL SURVEY
ENTERING B-DOUBLE 27.5m DRIVER'S EYE = 2.4m
ENTERING CAR DRIVER'S EYE HEIGHT = 1.1m
PROPOSED BARRIER
INDICATIVE NATURAL SURFACE SUBJECT TO ADDITIONAL SURVEY
APPROACHING B-DOUBLE 27.5m TOP OF ROOF = 3.0m
APPROACHING B-DOUBLE 27.5m DRIVER'S EYE HEIGHT = 2.4m
DATUM RL 260.000
DESIGN SURFACE LEVEL
NATURAL SURFACE LEVEL
CHAINAGE
TOODYAY RD SIGHT DISTANCE PROFILE - TRUCK
SCALE HORIZONTAL 1:1000
VERTICAL 1:100
FOR INFORMATION
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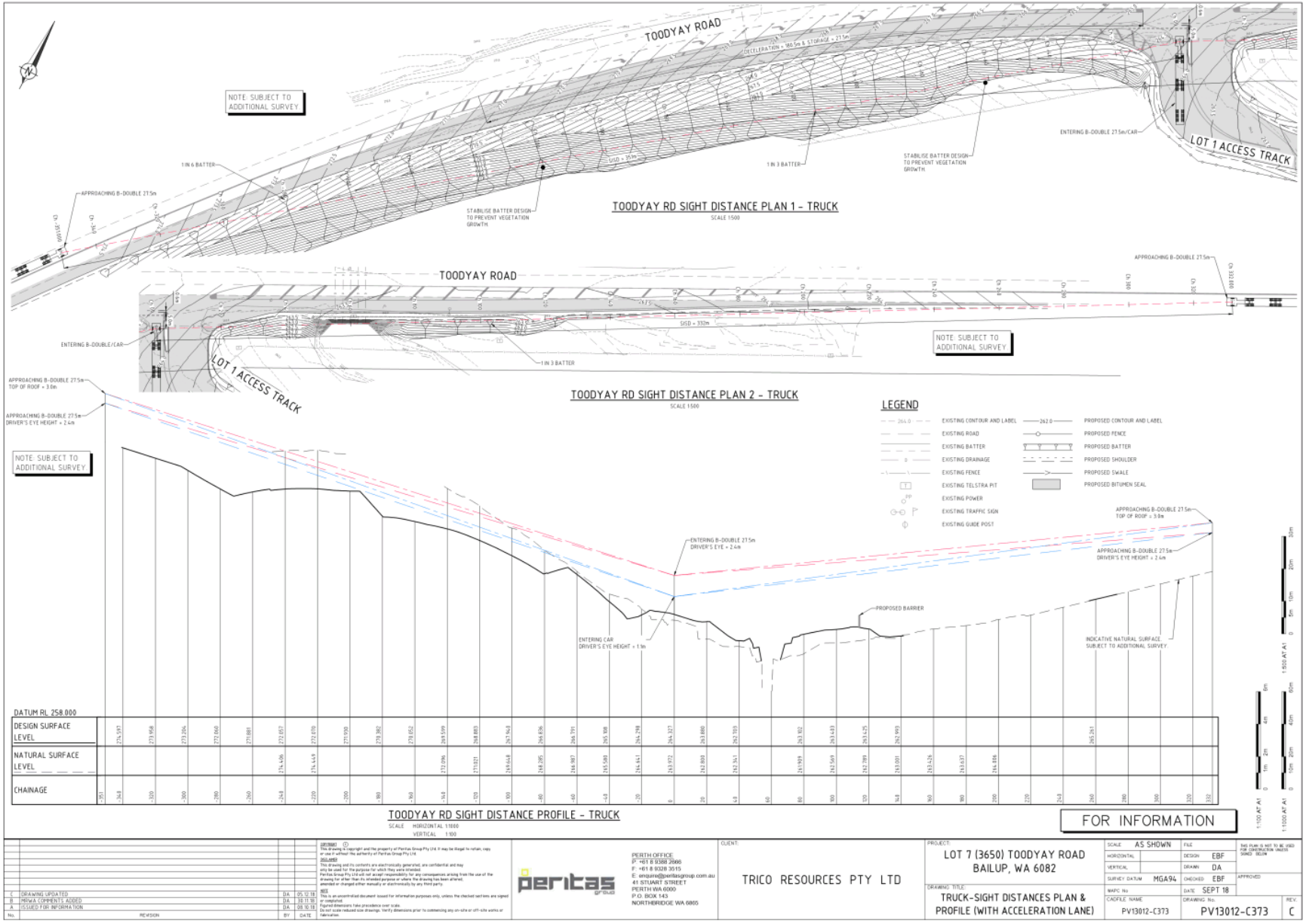
P.O. BOX 143
NORTHBRIDGE WA 6865
CLIENT:
TRICO RESOURCES PTY LTD
PROJECT:
LOT 7 (3650) TOODYAY ROAD
BAILUP, WA 6082
DRAWING TITLE:
TRUCK-SIGHT DISTANCES PLAN & PROFILE (WITHOUT ACCELERATION LANE)
SCALE AS SHOWN
HORIZONTAL
VERTICAL
SURVEY DATUM MGA94
WAPC No.
CADFILE NAME PV13012-C372
DESIGN EBF
DRAWN DA
CHECKED EBF
DATE SEPT 18
DRAWING No. PV13012-C372
REV B
B MRWA COMMENTS ADDED DA 31.11.18
A ISSUED FOR INFORMATION DA 08.10.18


TOODYAY ROAD
NOTE: SUBJECT TO ADDITIONAL SURVEY
1 IN 6 BATTER
APPROACHING B-DOUBLE 27.5m
STABILISE BATTER DESIGN TO PREVENT VEGETATION GROWTH
1 IN 3 BATTER
ENTERING B-DOUBLE 27.5m/CAR
LOT 1 ACCESS TRACK
TOODYAY RD SIGHT DISTANCE PLAN 1 - TRUCK
SCALE 1:500
TOODYAY ROAD
ENTERING B-DOUBLE/CAR
LOT 1 ACCESS TRACK
TOODYAY RD SIGHT DISTANCE PLAN 2 - TRUCK
SCALE 1:500
LEGEND
EXISTING CONTOUR AND LABEL
EXISTING ROAD
EXISTING BATTER
EXISTING DRAINAGE
EXISTING FENCE
EXISTING TELSTRA PIT
EXISTING POWER
EXISTING TRAFFIC SIGN
EXISTING GUIDE POST
PROPOSED CONTOUR AND LABEL
PROPOSED FENCE
PROPOSED BATTER
PROPOSED SHOULDER
PROPOSED SWALE
PROPOSED BITUMEN SEAL
APPROACHING B-DOUBLE 27.5m TOP OF ROOF = 3.0m
APPROACHING B-DOUBLE 27.5m DRIVER'S EYE HEIGHT = 2.4m
ENTERING B-DOUBLE 27.5m DRIVER'S EYE = 2.4m
PROPOSED BARRIER
ENTERING CAR DRIVER'S EYE HEIGHT = 1.1m
INDICATIVE NATURAL SURFACE SUBJECT TO ADDITIONAL SURVEY.
DATUM RL 258.000
DESIGN SURFACE LEVEL
NATURAL SURFACE LEVEL
CHAINAGE
TOODYAY RD SIGHT DISTANCE PROFILE - TRUCK
SCALE HORIZONTAL 1:1000
VERTICAL 1:100
FOR INFORMATION
C DRAWING UPDATED DA 05.12.18
B MRWA COMMENTS ADDED DA 30.11.18
A ISSUED FOR INFORMATION DA 09.10.18
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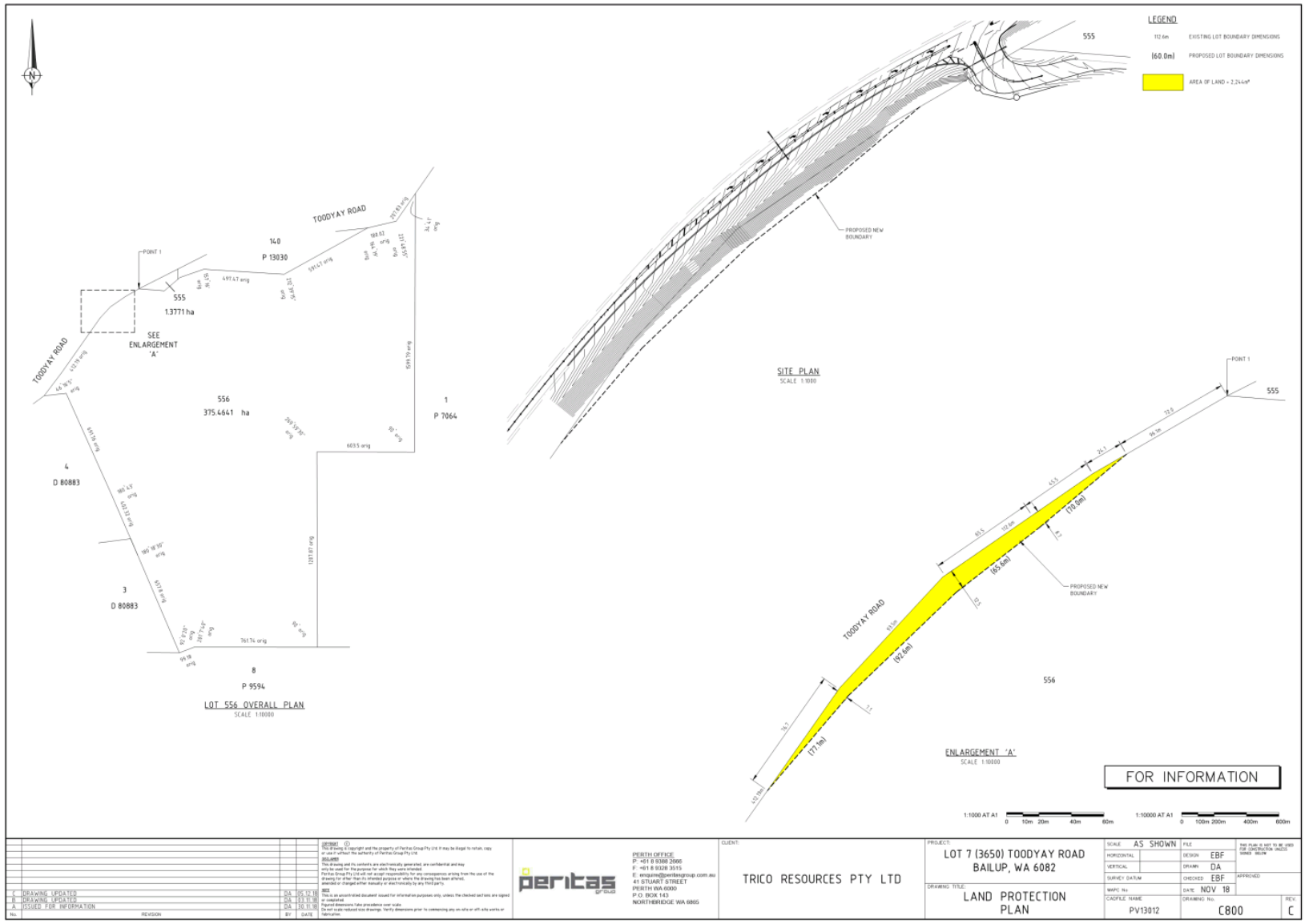
NORTHBRIDGE WA 6865
CLIENT: TRICO RESOURCES PTY LTD
PROJECT: LOT 7 (3650) TOODYAY ROAD BAILUP, WA 6082
DRAWING TITLE: TRUCK-SIGHT DISTANCES PLAN & PROFILE (WITH ACCELERATION LANE)
SCALE AS SHOWN
HORIZONTAL
VERTICAL
SURVEY DATUM MGA94
WAPC No
CADFILE NAME PV13012-C373
FILE
DESIGN EBF
DRAWN DA
CHECKED EBF
DATE SEPT 18
DRAWING No. PV13012-C373
REV. C
1:500 AT A1
1:1000 AT A1


LEGEND
EXISTING LOT BOUNDARY DIMENSIONS
PROPOSED LOT BOUNDARY DIMENSIONS
AREA OF LAND = 2,244m²
TOODYAY ROAD
140
P 13030
555
1.3771 ha
SEE ENLARGEMENT 'A'
556
375.4641 ha
1
P 7064
4
D 80883
3
D 80883
8
P 9594
LOT 556 OVERALL PLAN
SCALE 1:10000
SITE PLAN
SCALE 1:1000
PROPOSED NEW BOUNDARY
(70.5m²)
(65.6m²)
(92.6m²)
(77.1m²)
ENLARGEMENT 'A'
SCALE 1:1000
FOR INFORMATION
1:1000 AT A1
1:10000 AT A1
C DRAWING UPDATED DA 05.12.18
B DRAWING UPDATED DA 13.11.18
A ISSUED FOR INFORMATION DA 30.11.18
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P.O. BOX 143
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CLIENT:
TRICO RESOURCES PTY LTD
PROJECT:
LOT 7 (3650) TOODYAY ROAD
BAILUP, WA 6082
DRAWING TITLE:
LAND PROTECTION PLAN
SCALE AS SHOWN
DESIGN EBF
DRAWN DA
CHECKED EBF
DATE NOV 18
CADFILE NAME PV13012
DRAWING No. C800
REV. C

10.4 Dogs - New Exercise Area

File Code	LE.MIS 3
Author	Adrian Dyson, Manager Community Safety and Emergency Management
Senior Employee	Mark Luzi, Director Statutory Services
Disclosure of Any Interest	Nil
Attachments	1. Submissions (confidential)

SUMMARY

In accordance with the *Dog Act 1976* (the Act) Council is required to specify selected public places to be Dog Exercise Areas (DEA's) by firstly giving local public notice of its intention to specify such areas.

A proposed new DEA (in addition to the 44 DEA's declared in 2017) was the subject of local public notice. Comments were invited to be submitted to Shire of Mundaring by 26 August 2020. Eleven (11) submissions were received in that regard.

This report recommends that Council specify Part Reserve 43904 (Lot 301) Helena Valley Road as a dog exercise area.

BACKGROUND

Council at its meeting of 14 July 2020 (C20.07.20) resolved the following:

"That Council gives 28 days public notice of its intention to specify Part Reserve 43904 (Lot 301 Helena Valley Road) as a dog exercise area.

STATUTORY / LEGAL IMPLICATIONS

The key sub sections of the *Dog Act 1976, s 31. Control of dogs in public places* are summarised as follows:

- *s. 31 (2B)* States that a local government may specify public places (under its care, control or management) to be DEA's

- *s. 31 (5)* States that a local government must specify DEA's that are in its opinion sufficient in number and suitable for exercising dogs in the district; and

- *s. 31 (3C)* In giving notice of its intention to specify a public place as a DEA a local government must at least 28 days before so specifying such a place as a DEA give public notice as defined in the *Local Government Act 1995, s. 1.7*

POLICY IMPLICATIONS

Nil

FINANCIAL IMPLICATIONS

Nil

STRATEGIC IMPLICATIONS

Mundaring Strategic Community Plan 2020 - 2030

Priority 4 - Governance

Objective 4.3 – A well engaged and informed community and a high standard of customer service

Strategy 4.3.2 – The community is engaged in planning for the future and other matters that affect them

SUSTAINABILITY IMPLICATIONS

Nil

RISK IMPLICATIONS

Risk: Reputational Risk: If Council resolves to not specify the land concerned as a dog exercise area		
Likelihood	**Consequence**	**Rating**
Possible	Minor	Low
Action / Strategy		
To mitigate this risk Council should clearly articulate the reasons it does not support specifying the land concerned as a dog exercise area		

EXTERNAL CONSULTATION

External consultation was conducted via public notice within the Echo newspaper on 25 July 2020, and on the Shire website, Facebook page and Shire Administration Centre and libraries notice boards from 25 July 2020. The public notice called for comments to be received by 26 August 2020.

11 submissions of comment were received with the number of principal themes of the comments able to be collated and summarised as follows:

- 7 for/supporting the specification of the land concerned as a DEA
- 1 for/supporting the specification of the land concerned as a DEA and suggesting fencing the area concerned may be an option
- Three against the specification of the land concerned as a DEA, however suggesting another area/areas.

Refer also **Confidential Attachment 1.**

COMMENT

As there was majority support within the public comment submissions for the proposed DEA it is considered appropriate for Council to formally specify the land concerned as a DEA.

It is noted that the public comment suggestions as to alternative sites for a new DEA nominated land/s that were not in the care/control or management of Shire of Mundaring and thus could not be specified as a DEA by Shire of Mundaring.

In relation to the public comment submission suggesting that the land concerned be fenced (if it is to specified as a DEA) it is considered appropriate to monitor the overall

performance of the land concerned as a DEA before a decision in that regard. Further it is noted in that regard that the use of a DEA requires that the person responsible for a dog/dogs being exercised on/within a DEA must at all times have effective control of the dog/dogs concerned.

VOTING REQUIREMENT

Absolute Majority

RECOMMENDATION

That Council, by absolute majority, in accordance with the *Dog Act 1976 s. 31 (3A)* specifies Part Reserve 43904, Lot 301 Corner Helena Valley Road and Goldsbrough Entrance, Helena Valley as a Dog Exercise Area.

10.5 Food Organics and Garden Organics (FOGO) Third Kerbside Bin

File Code	WM.SER 02.1
Author	Shane Purdy, Director Infrastructure Services
Senior Employee	Shane Purdy, Director Infrastructure Services
Disclosure of Any Interest	Nil
Attachments	Nil

SUMMARY

Reducing landfilled food and garden organics is a major waste minimisation priority for national, state and many local governments. In response, many local governments nationwide are introducing kerbside food organic and garden organic (FOGO) waste collection, for subsequent processing in a FOGO specific facility. A FOGO service will involve a community wide behavioural change program that will deliver environmental benefits.

In considering the current information on the introduction of a third bin FOGO service, it is recommended that Council approve this new service, in principle, and review this position again following receipt of further information.

BACKGROUND

Food and garden organics are a key target for increased resource recovery. Organics represent the single largest fraction in a household garbage bin and downstream produce detrimental environmental impacts within the landfill environment. A 2019 audit of EMRC member councils' residual waste stream found organics amounted to 55.1% of total bin weights.

The Western Australian Government in its Waste Avoidance and Resource Recovery Strategy 2030 has set a target that by 2030 only 15% of waste within the Perth and Peel regions will be landfilled. Achieving the 2030 target is largely premised on metropolitan and Peel region local governments having in place a Food Organics - Garden Organics (FOGO) system by 2025.

The EMRC in response to the challenge of this target adopted a Food Organics and Garden Organics (FOGO) Waste Strategy at its 19 September 2019 meeting where it was resolved as follows;

> *"THAT COUNCIL ENDORSES THE DRAFT FOOD ORGANICS AND GARDEN ORGANICS (FOGO) RECOVERY STRATEGY SUBJECT TO THE LAST DOT POINT UNDER 'PRINCIPLES' ON PAGE 9 BEING AMENDED TO STATE "THE FUNDING OF BINS, CADDIES AND INITIAL EDUCATION / PRODUCT MARKETING FOR MEMBER COUNCILS WILL BE FUNDED THROUGH THE SECONDARY WASTE RESERVE."*

This EMRC FOGO Strategy has resulted in the following actions;

- a costing model for a three bin collection system being prepared for each member Local Government
- payment of funds from the EMRC Secondary Waste Reserve to member Local Governments to assist pay for additional bins and setup costs for a three bin system

- the commencement of an interim FOGO facility service at Redhill for the Town of Bassendean and City of Bayswater
- engaged additional education staff for the important change management program
- preparation of a feasibility study for a permanent FOGO facility; and
- the shortlisting of proponents via expressions of interest process for participation in a tender process to deliver a permanent FOGO facility for the EMRC.

The indicative timeline for the implementation of the tender process for a permanent FOGO facility is as follows:

PROJECT STAGE	DATE
Tenders called	December 2020
Tender period	15 weeks
Tender review	March – May 2021
Council approval	June 2021
Preferred tenderer notified	June 2022
Contract award	July/August 2021
Construction period	15 – 18 months (subject to tender)
Commissioning	Jan 2023 (subject to tender)
Operations commence	Mar 2023 (subject to tender)

Based on this the Shire of Mundaring could commence FOGO operations in early 2023. It is noted the commencement of taking residual waste (ie non organics or non recyclables) to the East Rockingham waste to energy facility instead of landfill is due to commence at around the same time. From this time there would be no municipal waste going to landfill, thus easily achieving the State target well ahead of 2030.

At its meeting of 17 September 2020, EMRC, in endorsing the feasibility report for a permanent FOGO facility, has requested confirmation from the Shire of Mundaring that it will participate in the proposed third bin FOGO service to enable EMRC to confirm technical requirements for a tender to be called in December 2020.

STATUTORY / LEGAL IMPLICATIONS

Shire of Mundaring, as a member Local Government of the EMRC, may participate in activities of the EMRC as set out within the EMRC establishment agreement.

POLICY IMPLICATIONS

Nil

FINANCIAL IMPLICATIONS

Cost modelling on the introduction of a third bin FOGO system, based on a gate fee price of $135 per tonne, indicates a likely increase of around $20 per standard residential waste charge to cover the ongoing operating costs of all existing waste services and the additional third bin FOGO service. The current standard residential waste charge is $405 (down from $442 in 2019/20 and $495 in 2018/19).

The gate fee price of $135 per tonne for FOGO was estimated based on information determined by EMRC from an expressions of interest tender process which also shortlisted companies for the upcoming tender for the permanent FOGO facility. This is considered the upper limit price as the tender process may result in a more competitive rate being offered.

The EMRC paid the Shire of Mundaring $1,455,200 to assist with the capital costs and introduction costs involved in purchasing and delivering out a third bin, changeover of bin lids for the residual waste bin to a red coloured lid, provision of bin caddies/compostable bin liners and educational promotion. This money is to be returned if Council resolves not to participate in a three bin FOGO service.

In addition, the State Government has a Better Bins Plus Program. The amount of funding available in this program reduces by $2 each year from $25 per household in 2020/21 to $15 in 2025/26. The funding is only available in the year the service is introduced. Should the Shire of Mundaring commence a FOGO bin service in 2022/23 then funding of $21 per household would be available. Based on 14,300 residential services this would amount to approximately $300,000.

Should the Shire proceed with a third bin FOGO system the combination of both the EMRC funds and the Better Bins Plus funds is likely to result in a small surplus of funds that could be used to offset increases in annual waste operating costs in the initial years of introduction.

STRATEGIC IMPLICATIONS

Mundaring Strategic Community Plan 2020 - 2030

Priority 2 - Natural Environment

Objective 2.3 – Waste management that is efficient and sustainable

Strategy 2.3.2 – Increase recycling rates and diversion from landfill

SUSTAINABILITY IMPLICATIONS

The introduction of a third bin FOGO service will have broad environmental benefits and strongly aligns with the Strategic Community Plan and community vision for the Shire of Mundaring to be “The Place for Sustainable Living.”

RISK IMPLICATIONS

Risk: Financial impact – final costs may vary from the modelled costs to operate a third bin FOGO service		
Likelihood	**Consequence**	**Rating**
Possible	Moderate	Moderate
Action / Strategy		
Greater confidence in likely cost impacts will be known after the EMRC tender process is concluded and details of the Participants Agreement are in a final draft form. This is currently timed to occur by the middle of 2021. This will still leave adequate time to roll out a third bin FOGO service by early 2023 being the current proposed commencement date of the permanent FOGO facility. It is therefore possible to hold off a final decision until mid-2021.		

EXTERNAL CONSULTATION

Nil

COMMENT

The EMRC requires a response as to whether the Shire will introduce a three bin FOGO service, which assists them in finalising specification requirements for the proposed establishment of a permanent FOGO facility.

The environmental benefits and achieving the State waste reduction target set for waste to landfill will be achieved by undertaking a third bin FOGO service.

This service is likely to come at a modest increase in overall operating cost. The capital costs and introduction costs would be covered from the monies received form the EMRC and the State Government Better Bins Program.

Prior to award of a contract by EMRC to a contractor to establish a permanent FOGO facility, the member Local Governments will be asked to sign off on a Participants Agreement, which will detail all the matters of participation. This is expected to occur around July 2021 based on proposed timelines.

At that time, the gate fee cost for FOGO will be more certain and the operational requirements known. There will also be a likely need to seek legal advice to do due diligence on contractual arrangements between the Shire, EMRC and Contractor.

In consideration of all of the above comments it is suggested approval in principle be given for the Shire of Mundaring to introduce a third bin FOGO system consistent with the State's and EMRC's FOGO strategies and best practice guidelines. Final confirmation can then be considered following the EMRC tender process for a permanent FOGO facility and receipt of a draft Participants Agreement.

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION

That Council approves, in principle, the introduction of a third bin FOGO system consistent with the State's and EMRC's FOGO strategies and best practice guidelines, with final confirmation to be considered following the EMRC tender process for a permanent FOGO facility and receipt of a draft Participants' Agreement.

10.6 Application for Rates Exemption as a Charitable Purpose - Community Housing Limited

File Code	Cl 6.101
Author	Stan Kocian, Manager Finance and Governance
Senior Employee	Garry Bird, Director Corporate Services
Disclosure of Any Interest	Nil
Attachments	Nil

SUMMARY

Community Housing Limited has applied for an exemption of Shire rates for its property in Chidlow under Section 6.26 (2) (g) of the *Local Government Act 1995.*

This report recommends that Council approves the request for rate exemption for the property owned by Department of Housing and leased to Community Housing Limited at 101 Clifton Street Chidlow as the land is considered to be used for 'charitable purposes' and thus qualifies for rates exemption under the relevant legislation.

BACKGROUND

Community Housing Limited (CHL) is a provider of social and affordable housing.

CHL previously applied for a rates exemption for the above property October 2016. The exemption request was refused by Council at that time (C2.10.16):

"That *Council refuses the application for Rate Exemption from Community Housing Ltd on the grounds that provision of housing for people with disabilities is not a charitable purpose."*

CHL has provided the following documentation in support of their request for rate exemption under section 6.26 (2) (g) of the *Local Government Act 1995*:

- Application for Rates Exemption with Statutory Declaration;
- Copy of ATO Tax – Charity Concession Status;
- Registration Certificate;
- Copy of Lease Agreement between Community Housing Ltd and Department of Housing;
- Copy of Constitution; and
- Copy of the latest audited Annual Report for the period ended 30 June 2019

The CHL application for rate exemption has stated that the property will be used (and has been used) for housing people with disabilities referred by the Disability Services Commission.

STATUTORY / LEGAL IMPLICATIONS

Section 6.26 (2) (g) of the *Local Government Act 1995* which provides –

"(2) The following land is not rateable land –

(g) land used for charitable purposes;"

Whilst the Act stipulates that where an organisation or individual uses land for a charitable purpose, the owners of that land can be exempted from paying local government rates, the Act does not provide a clear definition of what constitutes a charitable purpose.

Using case law precedence, each local government has the responsibility to assess and decide on applications from organisations seeking an exemption from paying rates. The types of land uses generally considered to be of charitable nature include community housing, accommodation for the aged, people with disabilities, disadvantaged persons etc.

The *Charitable Collections Act 1946* and other sources define the term "charitable purposes". Each definition appears to have as its origin from the *Charitable Uses Act 1601* and the House of Lords case of 1891 which define a charitable purpose to include: relief of the aged, impotent and poor, the advancement of education and religion and other purposes of benefit to the community.

Parts a) and g) of the *Charitable Collections Act 1946* definition of a "charitable purpose" should be considered:

"*(a) the affording of relief to diseased, sick, infirm, incurable, poor, destitute, helpless or unemployed persons, or to the dependants of any such persons;*

(g) any other benevolent, philanthropic or patriotic purpose."

POLICY IMPLICATIONS

Nil

FINANCIAL IMPLICATIONS

The general rates for this property in 2020/21 are $1388.67.

STRATEGIC IMPLICATIONS

Mundaring Strategic Community Plan 2020 - 2030

Priority 4 - Governance

Objective 4.4 – High standard of governance and accountability

Strategy 4.4.8 – Compliance with the Local Government Act 1995 and all relevant legislation and regulations

SUSTAINABILITY IMPLICATIONS

Nil

RISK IMPLICATIONS

Risk: There is a reputational and financial risk in that a decision not to grant the rates exemption could be appealed by CHL at the State Administration Tribunal.		
Likelihood	**Consequence**	**Rating**
Possible	Minor	Moderate

Action / Strategy
Council approves the rate exemption as the land use of providing housing to people with disabilities is considered a charitable purpose under the generally accepted legal definition of a charitable purpose.

EXTERNAL CONSULTATION

Nil

COMMENT

The essence of a rates exemption under section 6.26 (2) (g) of the *Local Government Act 1995* is that the actual land is being used for a "charitable purpose". CHL's application for rate exemption has stated that the property will be, and has been, used exclusively for housing accommodation for people with disabilities referred by the Disability Services Commission. This aligns with the legal interpretation of "charitable purposes".

A rates exemption under section 6.26 (2) (g) does not apply to waste charges and the Emergency Service Levy.

Council has previously approved the following rates exemptions:

Organisation	Council decision reference number	Charitable Purpose
Headwest Brain Injury Association	C7.05.08	Improved quality of life for people with an acquired brain injury.
WA Baptist Homes & Hospital Trust	C7.07.08	Provides facilities and services for elderly persons in need of such care.
Hills Community Support Group Inc (Community Living Program)	C11.04.08	Support accommodation for people with an intellectual disability who are all recipients of disability pensions.
The Silver Tree Steiner School	C7.08.11	Education of Children.
Autism Association of Western Australia	C13.06.13	Housing and support of individuals with an Autism Spectrum Disorder.
Swan Emergency Accommodation (Inc)	C4.10.16	Provides supported accommodation to families and young people who would otherwise likely be homeless.
Mundaring Church of Christ	C5.10.16	Property used exclusively as a place of residence for a fulltime Minister.

Martin Copley Will Trust	C6.10.16	Provides a safe environment for native wildlife mainly mammals

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION

That Council:

1. Approves a rate exemption to Community Housing Limited for the property located at 101 Clifton Street Chidlow effective from 1 July 2020, in accordance with section 6.26 (2) (g) of the *Local Government Act 1995,* as the provision of housing to people with disabilities is considered a charitable purpose land use; and
2. Notes that the annual general rates charged in 2020/21 are $1388.67 for the above property.

10.7 Statement of Financial Activity for period ended 31 August 2020

File Code	FI.RPT 2
Author	Stan Kocian, Manager Finance and Governance
Senior Employee	Garry Bird, Director Corporate Services
Disclosure of Any Interest	Nil
Attachments	1. Statement of Financial Activity for period ended 31 August 2020 ⇩

SUMMARY

The monthly Statement of Financial Activity discloses the Shire's financial position as at 31 August 2020.

The actual closing budget position as at 31 August 2020 was a surplus of $37,668,697, compared to a budgeted year to date surplus to the end of August of $34,579,506. The budgeted year end surplus is $1,545,251 as per the original budget adopted by Council (C2.07.20).

BACKGROUND

The monthly financial report is presented in accordance with the *Local Government Act 1995* and the *Local Government (Financial Management) Regulations 1996.*

A statement of financial activity and any accompanying documents are to be presented to the Council at an ordinary meeting of the Council within two months after the end of the month to which the statement relates.

The Statement of Financial Activity Report summarises the Shire's financial activities.

STATUTORY / LEGAL IMPLICATIONS

Regulation 34(1) of the *Local Government (Financial Management) Regulations 1996* requires a local government to prepare each month a statement of financial activity.

Regulation 34(2) requires the statement of financial activity to report on the sources and applications of funds, as set out in the annual budget.

POLICY IMPLICATIONS

Nil

FINANCIAL IMPLICATIONS

Financial implications are in accordance with the approved reporting material variances (C14.07.20) of:

- (+) or (-) $50,000 or 10%, whichever is the greater for Revenue
- (+) or (-) $100,000 or 10%, whichever is the greater for Expenses

within the monthly Statement of Financial Activity during the 2020/21 financial year.

STRATEGIC IMPLICATIONS

Mundaring 2026 Strategic Community Plan

Priority 1 - Governance

Objective 1.1 – A fiscally responsible Shire that prioritises spending appropriately

Strategy 1.1.4 – Practice effective governance and financial risk management

SUSTAINABILITY IMPLICATIONS

Nil

RISK IMPLICATIONS

Risk: Financial performance is not monitored against approved budget		
Likelihood	**Consequence**	**Rating**
Possible	Minor	Moderate
Action / Strategy		
The monthly financial report tracks the Shire's actual financial performance against its budgeted financial performance to ensure that the Council is able to monitor to Shire's financial performance throughout the financial year.		

EXTERNAL CONSULTATION

Nil

COMMENT

The reports that accompany this item are as follows:

- A graphical representation of the year to date comparison to budget for operating revenue, operating expenses and capital expenses;
- Statement of Financial Activity (based on the Rate Setting Statement adopted in the annual budget) for the period ending 31 August 2020;
- An explanation of the material variances in the Statement of Financial Activity
- The closing budget position for the period ending 31 August 2020 and comparison to the year to date budget and same period last year;
- An explanation of the key terms and definitions used in the Statement of Financial Activity;
- The closing budget position for the period ending 31 August 2020 and comparison to the year to date budget and same period last year;
- A statement of year to date operating expenses by each area of budget responsibility and a graphical comparison of year to date operating expense to the year to date budget; and
- Summary of Cash Investments with financial institutions as at 31 August 2020.

In relation to the material variances, "timing" differences are due to the monthly spread of the budget not matching the actual spread of revenue or expenditure. Timing differences

will not result in a forecast adjustment. Where the material variance is flagged as "permanent" this indicates that a forecast adjustment to the annual budget is required or has been made.

The Shire's closing surplus as at 31 August 2020 was $37,668,697 compared to a year to date budgeted surplus of $34,579,506. This variation is primarily due to:

1. The Shire's forecast opening budget surplus in the adopted budget was $5,453,805 compared to an actual opening surplus position of $6,406,777 (actual opening position was finalised after the budget was adopted);

2. The Shire's year to date actual operating expenses being $1,821,742 less than the year to date budget (see explanation of variances);

3. The Shire's year to date actual operating revenue being $362,384 greater than the year to date budget (see explanation of variances); and

4. Capital expenditure being $56,282 greater than the year to date budget (see explanation of variances); and

Outstanding rates and waste charges as at 31 August 2020 was $23,182,655 compared to a figure of $21,419,632 at the same time last year. It should be noted the due date for payment of rates was 31 August this year, compared to a due date of 23 August last year. On the 8 September 2020 (i.e. 8 days post the due date) there was $21,117,239 outstanding in rates and waste charges.

The Shire's total cash as at 31 August 2020 was $48,607,853 which includes $21,241,606 in municipal funds ($23,534,317 at the same time last year) and $27,366,246 in cash backed reserves and other restricted funds.

VOTING REQUIREMENT

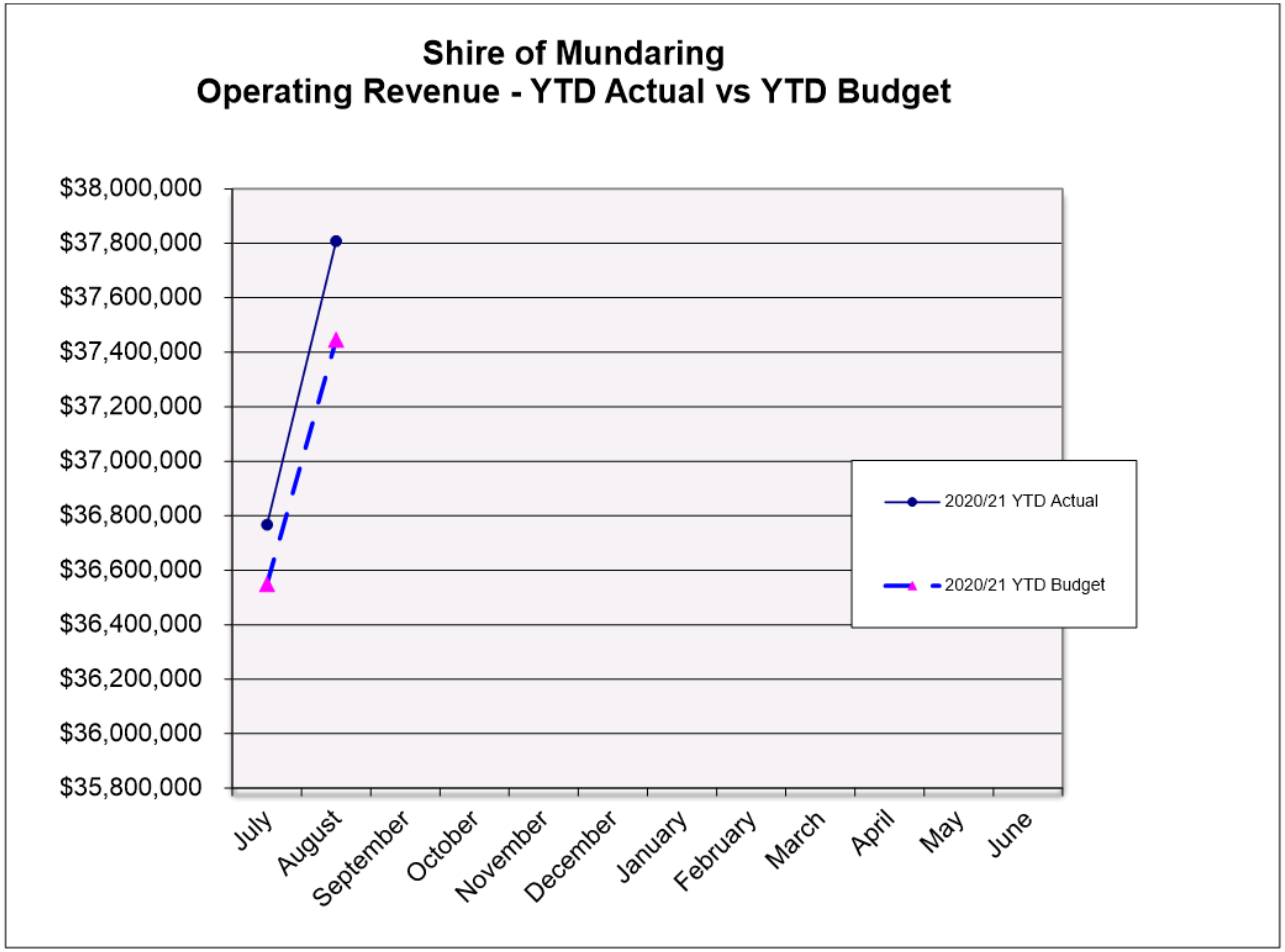
Simple Majority

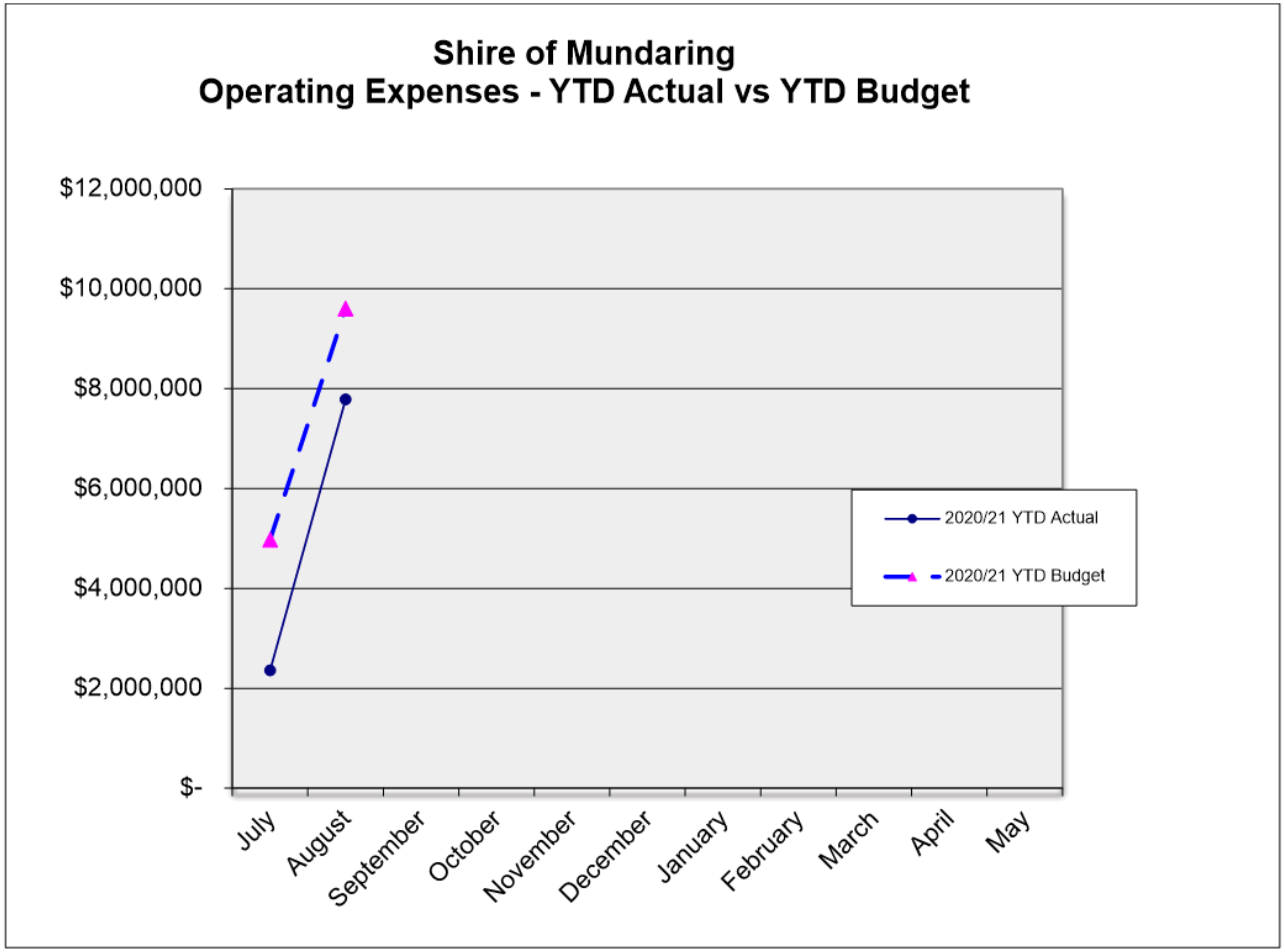
RECOMMENDATION

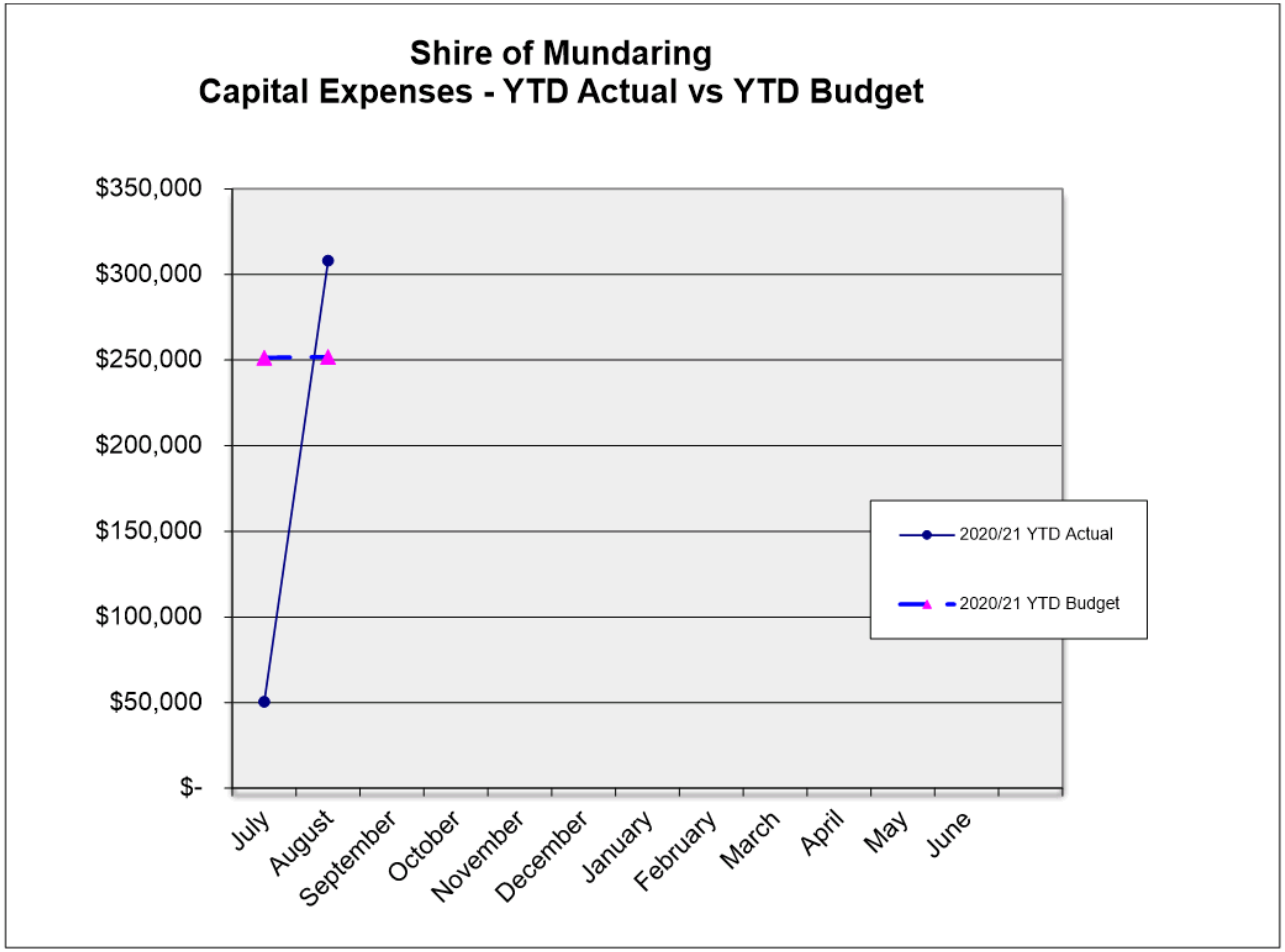
That Council notes:

1. the closing position of the Shire for the period ending 31 August 2020 is a surplus of $37,668,697 compared to the year to date budgeted surplus of $34,579,506; and

2. the explanation of material variances in the Statement of Financial Activity contained in **Attachment 1**.


Shire of Mundaring
Operating Revenue - YTD Actual vs YTD Budget
$38,000,000
$37,800,000
$37,600,000
$37,400,000
$37,200,000
$37,000,000
$36,800,000
$36,600,000
$36,400,000
$36,200,000
$36,000,000
$35,800,000
July
August
September
October
November
December
January
February
March
April
May
June
2020/21 YTD Actual
2020/21 YTD Budget


Shire of Mundaring
Operating Expenses - YTD Actual vs YTD Budget
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$-
July
August
September
October
November
December
January
February
March
April
May
2020/21 YTD Actual
2020/21 YTD Budget


Shire of Mundaring
Capital Expenses - YTD Actual vs YTD Budget
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$-
July
August
September
October
November
December
January
February
March
April
May
June
2020/21 YTD Actual
2020/21 YTD Budget

Shire of Mundaring
Statement of Financial Activity
for period ending 31 August 2020

	2020/21 YTD Budget	2020/21 YTD Actuals	2020/21 BUDGET	YTD Variance	YTD Variance
	$	$	$	$	%
Opening Funding Surplus/(Deficit)	5,453,805	6,406,777	5,453,805	952,972	17.5%
Revenue from operating activities					
General Purpose Funding - Rates	28,971,621	28,947,501	29,092,236	(24,120)	-0.1%
General Purpose Funding - Other	397,965	218,292	1,711,045	(179,673)	-45.1%
Governance	48,918	83,795	179,748	34,877	71.3%
Law, Order & Public Safety	100,100	295,595	562,400	195,495	195.3%
Health	4,366	34,543	46,200	30,177	691.2%
Education & Welfare	1,210,562	1,375,619	5,762,350	165,057	13.6%
Community Amenities	6,456,556	6,539,972	7,147,722	83,416	1.3%
Recreation and Culture	110,782	147,630	2,088,856	36,848	33.3%
Transport	2,666	29,182	65,700	26,516	994.6%
Economic Services	118,491	126,110	256,825	7,619	6.4%
Other Property and Services	24,248	10,422	414,007	(13,827)	-57.0%
Total	**37,446,275**	**37,808,659**	**47,327,089**	**362,384**	**1.0%**
Expenditure from operating activities					
General Purpose Funding	(149,763)	(99,329)	(811,573)	50,434	33.7%
Governance	(1,099,431)	(661,994)	(5,023,677)	437,437	39.8%
Law, Order & Public Safety	(493,008)	(410,742)	(2,476,558)	82,266	16.7%
Health	(161,061)	(123,280)	(787,645)	37,781	23.5%
Education & Welfare	(1,528,157)	(1,184,965)	(8,018,301)	343,192	22.5%
Community Amenities	(1,441,936)	(1,111,743)	(9,012,593)	330,193	22.9%
Recreation and Culture	(1,970,146)	(1,688,056)	(11,160,975)	282,090	14.3%
Transport	(1,928,218)	(2,031,932)	(12,243,036)	(103,714)	-5.4%
Economic Services	(143,668)	(115,172)	(738,656)	28,496	19.8%
Other Property and Services	(690,755)	(357,187)	(1,602,101)	333,568	48.3%
Total	**(9,606,143)**	**(7,784,401)**	**(51,875,115)**	**1,821,742**	**19.0%**
Operating activities excluded from rate setting					
Depreciation on Assets	1,353,404	1,372,714	8,120,471	19,310	-1.4%
(Profit)/Loss on Disposal of Assets	-	-	(635,822)	-	-100.0%
Amount attributable to operating activities	**29,193,536**	**31,396,972**	**2,936,623**	**2,203,436**	**7.5%**
Investing Activities					
Proceeds from Disposal of Assets	-	-	1,139,989	-	0.0%
Grants and Contributions	203,334	176,707	5,938,534	(26,627)	-13.1%
Purchase Property, Plant & Equipment	(251,834)	(42,665)	(2,666,564)	209,169	83.1%
Purchase Infrastructure	-	(265,451)	(8,245,167)	(265,451)	-100.0%
Amount attributable to investing activities	**(48,500)**	**(131,409)**	**(3,833,208)**	**(82,909)**	**170.9%**
Financing Actvities					
Repayment of Debentures	-	(54,334)	(666,777)	(54,334)	-100.0%
Transfers from Reserves	18,589	-	2,099,343	(18,589)	-100.0%
Transfers to Reserves	(37,924)	50,691	(4,444,535)	88,615	233.7%
Amount attributable to financing activities	**(19,335)**	**(3,643)**	**(3,011,969)**	**15,692**	**81.2%**
Closing Funding Surplus/(Deficit)	**34,579,506**	**37,668,697**	**1,545,251**	**3,089,191**	**8.9%**

Explanation of Material Variances

The material variance thresholds are adopted annually by Council as an indicator of whether the actual expenditure or revenue varies from the year to date budget materially.
The material variance for revenue adopted by Council for the 2020/21 year is $50,000 or 10% whichever is the greater.
The material variance for expenses adopted by Council for the 2020/21 year is $100,000 or 10% whichever is the greater.

Reporting Program	Var. $	Var. %	Timing/ Permanent	Explanation of Variance
Revenue from operating activities				
General Purpose Funding -Rates	(24,120)	(0.1%)		Within Variance threshold.
General Purpose Funding - Other	(179,673)	(45.1%)	Timing	Impact of reversal of interest accruals for 30 June 2020 - $121,903 which will self adjust as interest is earned in 2020/21. In addition Interim Rates $24,122 and Local Road Grant $12,4105 are less than YTD Budget.
Governance	34,877	71.3%	Timing	Refund from LGIS is $60,753 greater than YTD Budget, partially offset by ESL Commission which is $22,748 less than YTD Budget.
Law, Order & Public Safety	195,495	195.3%	Timing	DFES Mitigation Activity Fund is $277,833 greater that YTD Budget, partially offset by ESL Grant which is $90,000 less than YTD Budget.
Health	30,177	691.2%	Timing	Food Inspection Fees and Charges greater than YTD Budget - impact $27,750.
Education & Welfare	165,057	13.6%	Timing	IAS Grant $179,000 and Child Care Benefit Grant $36,688 are greater that YTD Budget, partially offset by Sundry Grants which is $46,000 less than YTD Budget.
Community Amenities	83,416	1.3%	Permanent	Waste Charges greater than YTD budget due to the number of bin services being greater than estimated.
Recreation and Culture	36,848	33.3%	Timing	External contributions income for the operation of Mount Helena Aquatic Centre $34,741 received earlier than anticipated in the budget.
Transport	26,516	994.6%	Timing	Income for the maintenance of Great Eastern Highway $28,000 received earlier than anticipated in the budget.
Economic Services	7,619	6.4%		Within Variance threshold.
Other Property and Services	(13,827)	(57.0%)	Timing	Lease Income for Bailup Reserve is $10,000 less than YTD Budget.

Expenditure from operating activities				
General Purpose Funding	50,434	33.7%	Timing	Rates Write-offs $33,327 and Office Expenses $10,656 are less than YTD Budget.
Governance	437,437	39.8%	Timing	Salaries $123,823, General Insurance $123,513, Equipment Maintenance $59,607, Workers Compensation Insurance $49,988 and Computer Running Expenses $29,956 are less than YTD Budget. The balances of variances are spread across a number of areas.
Law, Order & Public Safety	82,266	16.7%	Timing	Salaries $50,242 and Office Expenses $25,038 are less than YTD Budget.
Health	37,781	23.5%	Timing	Salaries are $19,265 less than YTD Budget. The balances of variances are spread across a number of areas.
Education & Welfare	343,192	22.5%	Timing	Salaries and Wages expenditure $221,508 and Insurance expenses $94,126 are less than YTD Budget.
Community Amenities	330,193	22.9%	Timing	Waste Collection Services $145,731, Maintenance Services $111,555 and Engineering Overheads $43,666 are less than YTD Budget. The balances of variances are spread across a number of areas.
Recreation and Culture	282,090	14.3%	Timing	Insurance $157,910, Engineering Overheads $48,093 and Utilities $42,332 are less than YTD Budget. The balances of variances are spread across a number of areas.
Transport	(103,714)	(5.4%)	Timing	Roads Maintenance $75,753 and Street Lighting Maintenance $42,225 are less than YTD Budget.
Economic Services	28,496	19.8%	Timing	Salaries $21,741 and Office Expenses $5,034 are less than YTD Budget.
Other Property and Services	333,568	48.3%	Timing	Salaries $140,539, Plant Operation $93,316 and Public Works Overheads $57,165 are less than YTD Budget. The balances of variances are spread across a number of areas.

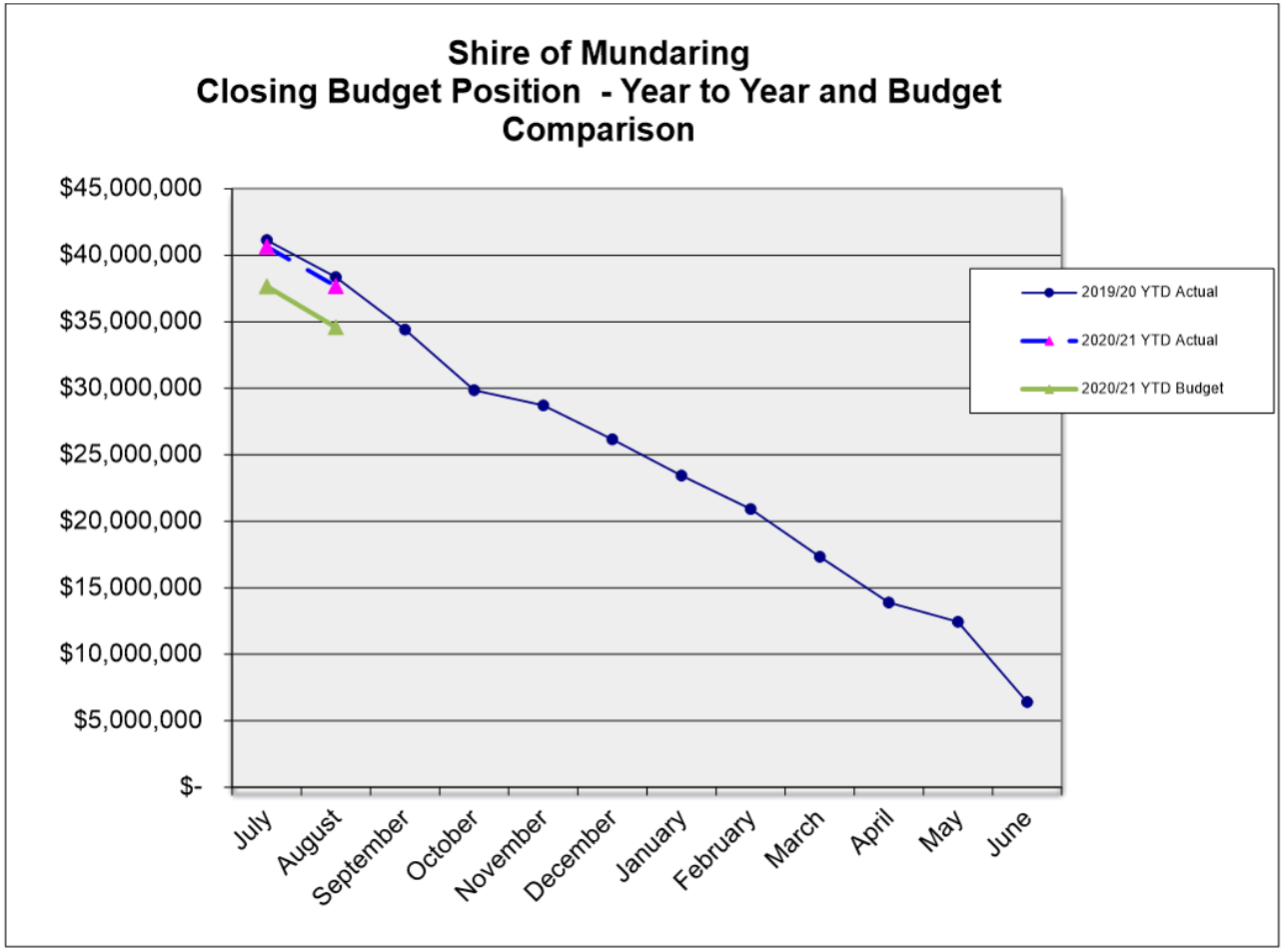
Operating activities excluded from rate setting				
Depreciation on Assets	19,310	(1.4%)	Permanent	Depreciation expense greater than what was estimated in budget.
(Profit)/Loss on Disposal of Assets	0	(100.0%)		Within Variance threshold.
Investing Activities				
Proceeds from Disposal of Assets	0	0.0%		Within Variance threshold.
Grants and Contributions	(26,627)	(13.1%)		Timing of Capital Grant Funds received YTD.
Purchase Property, Plant & Equipment	209,169	83.1%	Timing	Purchase of DFES funded Volunteer Bush Fire Brigade Vehicles $200,000 not aligned to the timing that was anticipated in the budget.
Purchase Infrastructure	(265,451)	(100.0%)	Timing	Expenditure on capital works is less than YTD Budget for Hudson Street $95,512, Wooloomooloo Road $44,134 and the Roads Resurfacing Program $61,719. The balances of variances are spread across a number of areas.
Financing Activities				
Repayment of Debentures	(54,334)	(100.0%)	Timing	Relates to the timing of loans repayments.
Transfers from Reserves	(18,589)	(100.0%)	Timing	No transfers required from reserves to the end of August.
Transfers to Reserves	88,615	233.7%	Timing	Impact of reversal of interest accruals for 30 June 2020 which will self adjust as interest is earned in 2020/21.

KEY TERMS AND DEFINITIONS USED IN STATEMENT OF FINANCIAL ACTIVITY

OBJECTIVE	ACTIVITIES
GOVERNANCE	
To provide a decision making process for the efficient allocation of resources.	Includes the activities of members of council and the administrative support required for the Council and Shire services.
GENERAL PURPOSE FUNDING	
To collect revenue to allow for the provision of services.	Rates, general purpose government grants and interest revenue.
LAW, ORDER, PUBLIC SAFETY	
To provide services to help ensure a safer community.	Supervision and enforcement of legislation and various local laws relating to fire prevention, animal control and other aspects of public safety including emergency services.
HEALTH	
To provide an operational framework for environmental and community health.	Prevention of human illnesses, including inspection of premises/food control.
EDUCATION AND WELFARE	
To provide services to disadvantaged persons, the elderly, children and youth.	Operating and maintaining child minding centres and playgroup centres. Provision of services and programs for the youth and seniors of the Shire.
COMMUNITY AMENITIES	
To provide essential services required by the community.	Rubbish collection services, operation of waste disposal sites, litter control, construction and maintenance of urban storm water drains, protection of the environment and administration of town planning schemes, cemeteries and public conveniences.
RECREATION AND CULTURE	
To establish and effectively manage infrastructure and resources which will help the social well being of the community.	Maintenance of public halls, civic centres, aquatic centres, lake, recreation centres and various sporting facilities. Provision and maintenance of parks, gardens and playgrounds. Operation of libraries and other cultural facilities.
TRANSPORT	
To provide safe, effective and efficient transport services to the community.	Construction and maintenance of roads, streets, pathways, depots, parking facilities and traffic control. Cleaning of streets and maintenance of street trees, street lighting etc.
ECONOMIC SERVICES	
To help promote the Shire and its economic wellbeing.	Tourism and area promotion. Provision of standpipes. Approval of building construction and implementation of statutory building controls.
OTHER PROPERTY AND SERVICES	
To monitor and control the Shire's overheads operating accounts.	Public works overheads, plant and equipment operations and activities not reported in the above programs.

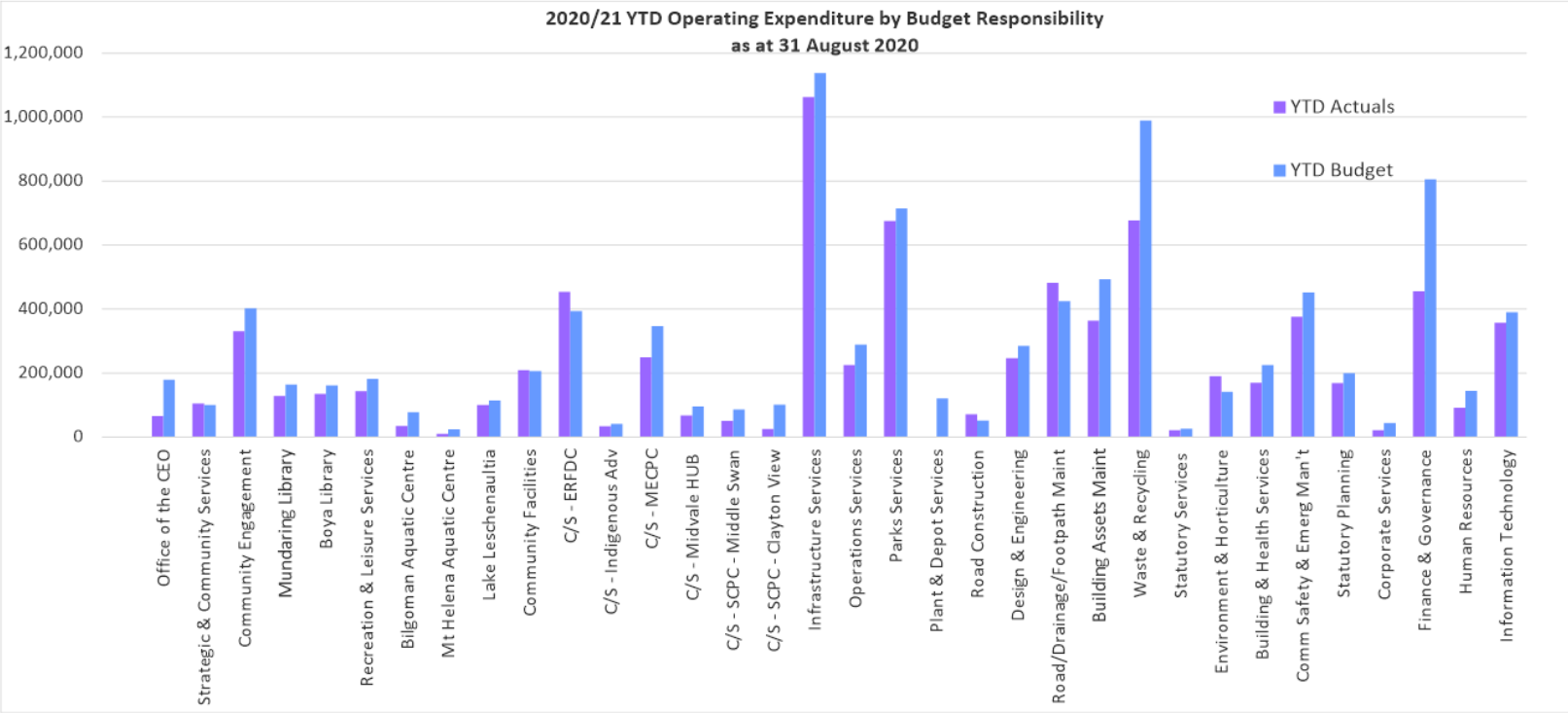
NET CURRENT ASSETS- BUDGET SURPLUS/(DEFICIT)

	Actual 31 August 2019		Actual 31 August 2020	
CURRENT ASSETS				
Rates & Sanitation Debtors	21,419,632		23,182,655	
Debtors	1,075,449		1,062,200	
TOTAL RECEIVABLES - CURRENT		**22,495,081**		**24,244,854**
STOCK ON HAND		**106,548**		**94,373**
CASH ASSETS				
Municipal	23,534,317		21,241,606	
Restricted Cash	24,442,330		27,366,246	
Total Bank Accounts		**47,976,646**		**48,607,853**
TOTAL CURRENT ASSETS		**70,578,275**		**72,947,080**
CURRENT LIABILITIES				
Creditors	(5,918,207)		(6,614,863)	
Borrowings - Current Portion	(635,200)		(666,777)	
Provisions	(3,245,465)		(3,717,460)	
		(9,798,872)		**(10,999,100)**
NET CURRENT ASSETS		**60,779,404**		**61,947,980**
Less Reserve Funds		**(21,918,565)**		**(25,152,323)**
Add Current Loan Liability		**635,200**		**666,777**
Add Current Lease Liability		**0**		**206,263**
CLOSING BUDGET SURPLUS/(DEFICIT)		**39,496,038**		**37,668,697**


Shire of Mundaring
Closing Budget Position - Year to Year and Budget Comparison
$45,000,000
$40,000,000
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$-
July
August
September
October
November
December
January
February
March
April
May
June
2019/20 YTD Actual
2020/21 YTD Actual
2020/21 YTD Budget

Shire of Mundaring
YTD Operating Expenditure by Budget Responsibility
for period ending 31 August 2020

	2020/21 YTD Actuals	2020/21 YTD Budget
Office of the CEO	65,054	178,667
Strategic & Community Services Directorate	103,855	100,568
Community Engagement	331,309	402,205
Mundaring Library	127,987	163,452
Boya Library	134,464	161,248
Recreation & Leisure Services	143,165	181,660
Bilgoman Aquatic Centre	34,291	77,884
Mt Helena Aquatic Centre	9,797	24,043
Lake Leschenaultia	99,575	114,445
Community Facilities	208,775	206,278
Children's Services - Eastern Region Family Day Care Scheme	454,144	394,034
Children's Services - Indigenous Advancement Strategy	32,883	40,466
Children's Services - Midvale Early Childhood & Parenting Centre	248,970	346,950
Children's Services - Midvale HUB Parenting Services	67,480	95,127
Children's Services - Swan Child and Parent Centre - Middle Swan	50,315	86,305
Children's Services - Swan Children and Family Centre - Clayton View	25,343	100,911
Infrastructure Services Directorate	1,063,211	1,138,107
Operations Services	224,882	288,371
Parks Services	674,804	714,615
Plant & Depot Services	(6,373)	120,978
Road Construction	71,691	51,166
Design & Engineering	245,662	285,142
Road/Drainage/Footpath Maintenance	482,280	424,532
Building Assets Maintenance	364,379	493,441
Waste & Recycling	676,977	989,222
Statutory Services Directorate	21,156	26,247
Environment & Horticulture	190,242	141,201
Statutory Building & Health Services	168,941	225,035
Community Safety & Emergency Management	375,555	451,585
Statutory Planning	168,142	199,422
Corporate Services Directorate	21,572	43,564
Finance & Governance (inc Elected Members Expenses)	455,794	805,271
Human Resources	91,421	144,141
Information Systems/Technology	356,659	389,860
Total	**7,784,401**	**9,606,143**
Totals from Statement of Financial Activity	**(7,784,401)**	**(9,606,143)**


2020/21 YTD Operating Expenditure by Budget Responsibility
as at 31 August 2020
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
YTD Actuals
YTD Budget
Office of the CEO
Strategic & Community Services
Community Engagement
Mundaring Library
Boya Library
Recreation & Leisure Services
Bilgoman Aquatic Centre
Mt Helena Aquatic Centre
Lake Leschenaultia
Community Facilities
C/S - ERFDC
C/S - Indigenous Adv
C/S - MECPC
C/S - Midvale HUB
C/S - SCPC - Middle Swan
C/S - SCPC - Clayton View
Infrastructure Services
Operations Services
Parks Services
Plant & Depot Services
Road Construction
Design & Engineering
Road/Drainage/Footpath Maint
Building Assets Maint
Waste & Recycling
Statutory Services
Environment & Horticulture
Building & Health Services
Comm Safety & Emerg Man't
Statutory Planning
Corporate Services
Finance & Governance
Human Resources
Information Technology

SHIRE OF MUNDARING

INVESTMENT SUMMARY as at 31 August 2020

		Amount Invested	Interest Rate	Period of Investment		Investment Date	Maturity Date
MUNICIPAL FUNDS							
Unrestricted Use Funds							
1	Bendigo Investment Account (on Call)	9,301,728	0.25%	N/A		N/A	N/A
132	Suncorp Bank	3,816,236	0.50%	181	days	2-Jun-20	30-Nov-20
144	Westpac	3,531,310	1.35%	184	days	30-Mar-20	30-Sep-20
	Total	**16,649,274**					
RESTRICTED ASSET FUNDS							
Restricted Use Funds							
4	Bendigo Investment Account (on Call)	2,210,753	0.25%	N/A		N/A	N/A
	Total	**2,210,753**					
		3,170.88	Movement from Muni to RA for Contract Retention completed on 1/9/20				
		2,213,924					
	TOTAL MUNI INVESTMENTS	**$18,860,027**					
RESERVE FUNDS							
2	Bendigo Investment Account (on Call)	5,912,001	0.25%	N/A		N/A	N/A
60A	Bendigo	3,511,082	1.30%	180	days	25-Mar-20	21-Sep-20
107	ANZ	2,534,942	0.85%	365	days	30-Apr-20	30-Apr-21
108	ANZ	1,897,159	0.85%	365	days	16-Apr-20	16-Apr-21
127	NAB	3,872,340	1.20%	365	days	9-Apr-20	9-Apr-21
128	Westpac	4,924,798	0.72%	212	days	22-Aug-20	22-Mar-21
145	NAB	2,500,000	1.22%	182	days	3-Apr-20	2-Oct-20
	TOTAL RESERVE INVESTMENTS	**25,152,323**					
	TOTAL MUNI / RESERVE INVESTMENTS	**$44,012,349**					
TRUST FUNDS							
POS Funds							
3	Bendigo Investment Account (on Call)	$3,099,837	0.25%	N/A		N/A	N/A
	TOTAL TRUST INVESTMENTS	**3,099,837**					

10.8 List of Payments made during August 2020

File Code	FI.RPT 1
Author	Stan Kocian, Manager Finance and Governance
Senior Employee	Garry Bird, Director Corporate Services
Disclosure of Any Interest	Nil
Attachments	1. Payments Between Meetings August 2020 ⇩

SUMMARY

A list of accounts paid from the Municipal Fund and Trust Fund under the Chief Executive Officer's delegated authority for the month of August 2020 is presented to Council for noting.

BACKGROUND

Council has delegated to the Chief Executive Officer (CEO) the exercise of its power to make payments from the Shire's Municipal and Trust Funds. In accordance with Regulation 13 of the *Local Government (Financial Management) Regulations 1996*, a list of accounts paid is to be presented to Council and be recorded in the minutes of the meeting at which the list was presented

STATUTORY / LEGAL IMPLICATIONS

Regulation 13 of the Local Government (Financial Management) Regulations 1996 states:

(1) *If the local government has delegated to the CEO the exercise of its power to make payments from the municipal fund or the trust fund, a list of accounts paid by the CEO is to be prepared each month showing for each account paid since the last such list was prepared –*

(a) the payee's name;

(b) the amount of the payment;

(c) the date of the payment; and

(d) sufficient information to identify the transaction

(3) A list prepared under sub regulation (1) or (2) is to be –

(a) presented to council at the next ordinary meeting of the council after the list is prepared; and

(b) recorded in the minutes of that meeting

POLICY IMPLICATIONS

AS-04 Purchasing Policy

FINANCIAL IMPLICATIONS

All payments have been made in accordance with the approved budget and reflects the effective and timely payment of the Shire's contractors and other creditors.

STRATEGIC IMPLICATIONS

Mundaring 2026 Strategic Community Plan

Priority 1 - Governance

Objective 1.1 – A fiscally responsible Shire that prioritises spending appropriately

Strategy 1.1.1 – Prudently consider resource allocation

SUSTAINABILITY IMPLICATIONS

Expenditure has been incurred in accordance with budget parameters, which have been structured on financial viability and sustainability principles

RISK IMPLICATIONS

Financial Impact

Risk: Payments are not monitored against approved budget and delegation		
Likelihood	**Consequence**	**Rating**
Possible	Minor	Moderate
Action / Strategy		
The monthly list of payments provides an open and transparent record of payments made under the CEO's approved delegation		

EXTERNAL CONSULTATION

Nil

COMMENT

Nil

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION

That Council notes the list of payments made during August 2020 (**Attachment 1**).

PAYMENTS BETWEEN MEETINGS

The schedule of accounts paid for the month of August 2020 totals **$ 4,568,142.83** and includes:

- Municipal Cheques 200419 – 200426; and
- Electronic Funds Transfers.

Schedule of Accounts:

	Amounts $	Total $
MUNICIPAL ACCOUNT		
MUNICIPAL CHEQUE PAYMENTS	954.77	
EFT PAYMENTS	3,515,887.37	
EFT PAYROLL PAYMENTS	927,718.00	
NATIONAL AUSTRALIA BANK (NAB PURCHASE CARD)	13,614.29	
FLEETCARE FUEL PAYMENTS	3,297.62	
BENDIGO MERCHANT BANK FEES	3,323.16	
BENDIGO DIRECT DEBIT FEES	310.53	
HP FINANCIAL SERVICES - EQUIPMENT LEASE	6,638.50	
COMMONWEALTH BANK – BPOINT FEES	527.33	
KONICA MINOLTA – PRINTER LEASE	3,414.52	
WA TREASURY CORPORATION	91,888.81	
RMS – LAKES MONTHLY LICENCE FEE	163.90	
RMS – MONTHLY SMS FEES	26.18	
WEX MOTORPASS	106.81	
QIKKIDS – FEES	216.04	
WINDCAVE – MERCHANT FEES	55.00	
TOTAL MUNICIPAL ACCOUNT		**4,568,142.83**
TRUST ACCOUNT		**0.00**
TOTAL ALL SCHEDULES		**4,568,142.83**

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
Cheque Details					
03/08/2020	**00200419**	**Office of State Revenue**	**REFUND**		**$ 57.12**
31/07/2020	REFUND		FESA REBATE REFUND 2019/2020 ASSESS 169230 & 230413	$ 16.13	
31/07/2020	REFUND		FESA REBATE REFUND 2019/2020 ASSESS 214039	$ 40.99	
03/08/2020	**00200420**	**Shire of Mundaring**	**PETTY CASH REIMBURSEMENT**		**$ 198.95**
31/07/2020	PETTY CASH		PETTY CASH REIMBURSEMENT - BROWN PARK	$ 198.95	
17/08/2020	**00200421**	**West Australian Newspapers Ltd**	**NEWSPAPER SUBSCRIPTIONS**		**$ 144.00**
03/08/2020	00156950		NEWSPAPER SUBSCRIPTIONS	$ 144.00	
17/08/2020	**00200422**	**Shire of Mundaring**	**PETTY CASH REIMBURSEMENT**		**$ 154.40**
17/08/2020	PETTY CASH		PETTY CASH REIMBURSEMENT - BROWN PARK	$ 154.40	
24/08/2020	**00200423**	**West Australian Newspapers Ltd**	**NEWSPAPER SUBSCRIPTIONS**		**$ 144.00**
03/08/2020	03266707		NEWSPAPER SUBSCRIPTIONS	$ 144.00	
27/08/2020	**00200425**	**Mr K L Sylvestre**	**REFUND**		**$ 55.00**
27/08/2020	823266		KEY BOND REFUND	$ 55.00	
31/08/2020	**00200426**	**Alinta Energy**	**GAS**		**$ 201.30**
25/08/2020	1563279509		GAS - BRUCE DOUGLAS PAVILION	$ 155.25	
25/08/2020	5346461905		GAS - BROWN PARK COMMUNITY CENTRE	$ 46.05	
			Total Confirmation Cheques	**$ 954.77**	**$ 954.77**
Electronic Funds Transfer					
03/08/2020	**2583.101-01**	**Midland Mowers**	**PARTS**		**$ 110.50**
23/07/2020	33000 # 11		SUPPLY IGNITION COIL FOR HONDA GX340	$ 110.50	
03/08/2020	**2583.104-01**	**Raeco**	**STATIONERY**		**$ 138.70**
21/07/2020	556717		STATIONERY ITEMS	$ 138.70	
03/08/2020	**2583.10596-01**	**TJ Signs & Vehicle Graphics**	**SIGNAGE**		**$ 440.00**
27/07/2020	001550		SUPPLY 200 X SOCIAL DISTANCING ADHESIVE FLOOR MARKERS	$ 440.00	
03/08/2020	**2583.11474-01**	**Swan Valley Fresh (Vendor Management**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 127.65**
27/07/2020	00029058		PROVISIONS FOR REFLECTIONS CAFE	$ 127.65	
03/08/2020	**2583.11563-01**	**RAMM Software Pty Ltd**	**SUBSCRIPTIONS**		**$ 11,358.85**
27/07/2020	RSL-16994		RAMM ANNUAL SUPPORT/MAINTENANCE FEE 01/07/2020 - 30/06/2021	$ 11,358.85	
03/08/2020	**2583.11965-01**	**Reality Landscapes & Consultancy (T**	**PRESENTATION SERVICES**		**$ 1,100.00**
30/07/2020	00000586		SCRIPT & PRESENTATION - PLANTING FOR SUCCESS	$ 1,100.00	
03/08/2020	**2583.12078-01**	**Recruitwest Pty Ltd**	**TEMP STAFF**		**$ 11,026.56**
30/07/2020	C INV 572646		TEMP STAFF - DEPOT	$ 4,558.16	
31/07/2020	C INV 572694		TEMP STAFF - DEPOT	$ 6,468.40	
03/08/2020	**2583.12134-01**	**W.A. Library Supplies**	**BOOK COVERING**		**$ 521.00**
21/07/2020	00130608		BOOK COVERING FOR KSP LIBRARY	$ 521.00	
03/08/2020	**2583.12136-01**	**Mr D P Hayes**	**DESIGN FEES**		**$ 600.00**
31/07/2020	1072		DESIGN COVID-19 GRANT GUIDELINES & COMMUNITY GRANT PROGRAMS	$ 600.00	
03/08/2020	**2583.12148-01**	**True Plumbing and Gas**	**PLUMBING**		**$ 1,353.00**
10/07/2020	INV-1284		REPAIRS TO WATER FOUNTAINS - VARIOUS LOCATIONS	$ 1,353.00	
03/08/2020	**2583.12185-01**	**Biobean Coffee Pty Ltd**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 638.00**
21/07/2020	00001007		PROVISIONS FOR REFLECTIONS CAFE	$ 638.00	
03/08/2020	**2583.12206-01**	**Highway Motor Trimmers (R & A Cox**	**MANUFACTURE WORKS**		**$ 490.05**
28/07/2020	3014		MANUFACTURE FELT COVER - NICHE WALL MUNDARING CEMETERY	$ 490.05	
03/08/2020	**2583.12336-01**	**MBC Trees and Bobcat**	**MITIGATION WORKS**		**$ 11,000.00**
30/07/2020	788-2020		MITIGATION WORKS - BAILUP PARK RES 11625/23728	$ 11,000.00	
03/08/2020	**2583.12451-01**	**Rainchaser Pumps and Reticulation**	**PARTS**		**$ 96.31**
31/07/2020	INV-1214		PARTS FOR 069MDG	$ 30.53	
31/07/2020	INV-1215		PARTS FOR P1004	$ 65.78	
03/08/2020	**2583.12579-01**	**Mr V Crowe**	**LANDSCAPE, MAINTENANCE & CLEANING SERVICES**		**$ 1,447.50**
28/07/2020	1510		LANDSCAPE SERVICES	$ 210.00	
28/07/2020	1511		LANDSCAPE SERVICES, PRESSURE CLEANING & REMOVE GREEN WASTE	$ 370.00	
28/07/2020	1512		CLEANING SERVICES	$ 210.00	
28/07/2020	1513		LANDSCAPE & MAINTENANCE SERVICES	$ 657.50	
03/08/2020	**2583.12640-01**	**Officeworks Ltd**	**STATIONERY**		**$ 231.93**
14/07/2020	10694629		STATIONERY ITEMS	$ 231.93	
03/08/2020	**2583.12794-01**	**Mount Helena Hardware**	**HARDWARE ITEMS**		**$ 118.50**
30/07/2020	14560		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 71.60	
30/07/2020	14777		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 46.90	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
03/08/2020	**2583.12805-01**	**Interactive Mining Services (KB Ham**	**PROJECT MANAGEMENT**		**$ 2,200.00**
27/07/2020	376B		PROJECT MANAGEMENT - RAHNIE RD SAFETY IMPROVEMENTS	$ 2,200.00	
03/08/2020	**2583.12866-01**	**From Scratch Small Event Catering**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 134.00**
27/07/2020	955		PROVISIONS FOR REFLECTIONS CAFE	$ 39.00	
31/07/2020	966		PROVISIONS FOR REFLECTIONS CAFE	$ 95.00	
03/08/2020	**2583.12899-01**	**NAPA (A Division of GPC Asia Pacific**	**WORKSHOP CONSUMABLES**		**$ 259.52**
21/07/2020	1320079901		SUPPLY BATTERIES FOR P4800 & P4819	$ 54.12	
21/07/2020	1320080204		SUPPLY OIL FILTERS FOR P284	$ 46.20	
21/07/2020	1320080328		SUPPLY LUBE FILTERS FOR 00MDG	$ 43.73	
21/07/2020	1320080781		SUPPLY OIL FILTERS & FUEL FILTERS FOR 007MDG & P182	$ 64.92	
21/07/2020	1320081196		SUPPLY BRAKE FLUID FOR P1013	$ 50.55	
03/08/2020	**2583.12944-01**	**Avon Tree Management (Kajanni Pty L**	**STREET TREE MAINTENANCE**		**$ 47,051.40**
27/07/2020	226		TREE REMOVAL - WOOROLOO CEMETERY	$ 6,732.00	
27/07/2020	209		TREE REMOVAL - STONELEIGH RD MT HELENA	$ 906.40	
27/07/2020	220		TREE REMOVAL - HELENA VALLEY RD HELENA VALLEY	$ 3,588.20	
27/07/2020	221		TREE REMOVAL - SAW DRIVE DARLINGTON	$ 2,039.40	
27/07/2020	222		STREET TREE MAINTENANCE	$ 3,172.40	
27/07/2020	227		STREET TREE MAINTENANCE	$ 3,234.00	
27/07/2020	215		SITE WORKS & VEGETATION REMOVAL - NEW MENS SHED	$ 3,748.80	
27/07/2020	210		SITE WORKS & VEGETATION REMOVAL - NEW MENS SHED	$ 4,022.70	
27/07/2020	212		SITE WORKS & VEGETATION REMOVAL - NEW MENS SHED	$ 4,162.40	
27/07/2020	211		TREE REMOVAL - TOMLINSON RD HOVEA	$ 514.80	
27/07/2020	213		SITE WORKS & VEGETATION REMOVAL - NEW MENS SHED	$ 4,772.90	
27/07/2020	216		DEAD TREE REMOVAL - HUDSON ST GLEN FORREST	$ 1,287.00	
27/07/2020	230		STREET TREE MAINTENANCE - RIDGEHILL RD HELENA VALLEY	$ 2,087.80	
28/07/2020	223		TREE REMOVALS - WOOROLOO CEMETERY & VARIOUS AREAS	$ 3,088.80	
28/07/2020	228		FORESTRY MULCH VERGES - BANKS AVE WOOROLOO	$ 2,248.40	
30/07/2020	214		SITE WORKS & VEGETATION REMOVAL - NEW MENS SHED	$ 1,445.40	
03/08/2020	**2583.12948-01**	**Domus Nursery (Heritage Way Pty Ltd**	**PLANTS**		**$ 391.60**
14/07/2020	144254		PLANTS	$ 391.60	
03/08/2020	**2583.13097-01**	**Survey Civil**	**DRAINAGE WORKS**		**$ 4,224.00**
31/07/2020	033		DRAINAGE WORKS - SAWYERS VALLEY OVAL (GREAT EASTERN HIGHWAY SIDE)	$ 3,234.00	
31/07/2020	034		SET FINAL LEVELS FOR WATER RUN OFF - MUNDARING ARENA	$ 990.00	
03/08/2020	**2583.13101-01**	**Mr M D Corica**	**TRAVEL REIMBURSEMENT**		**$ 78.93**
27/07/2020	TRAVEL		TRAVEL REIMBURSEMENT 84KM 14/07/2020 TO 22/07/2020	$ 78.93	
03/08/2020	**2583.13163-01**	**Toll Transport Pty Ltd**	**COURIER SERVICES**		**$ 26.09**
09/07/2020	0436-S364420		COURIER SERVICES	$ 26.09	
03/08/2020	**2583.13439-01**	**Mr D A Parish**	**EDUCATIONAL VIDEO**		**$ 930.00**
30/07/2020	1188		PRODUCE EDUCATIONAL VIDEO - PLANTING FOR SUCCESS	$ 930.00	
03/08/2020	**2583.13448-01**	**Town of Claremont**	**REIMBURSEMENT OF EXPENSES**		**$ 3,498.46**
28/07/2020	SI07895		REIMBURSEMENT OF LSL FOR JOHN BALCOMBE	$ 3,498.46	
03/08/2020	**2583.145-01**	**Schweppes Australia Pty Ltd (Asahi**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 406.43**
21/07/2020	0809655986		PROVISIONS FOR REFLECTIONS CAFE	$ 406.43	
03/08/2020	**2583.146-01**	**Eastern Hills Saws & Mowers Pty Ltd**	**PARTS**		**$ 523.00**
23/07/2020	45296 # 11		SUPPLY OF VARIOUS SMALL PARTS FOR WORKSHOP	$ 150.00	
30/07/2020	45026 # 4		SUPPLY OF VARIOUS SMALL PARTS FOR WORKSHOP	$ 13.00	
30/07/2020	45303 # 4		SUPPLY OF VARIOUS SMALL PARTS FOR WORKSHOP	$ 79.00	
30/07/2020	45305		SUPPLY OF VARIOUS SMALL PARTS FOR WORKSHOP	$ 210.00	
30/07/2020	45314 # 11		SUPPLY OF VARIOUS SMALL PARTS FOR WORKSHOP	$ 59.00	
30/07/2020	45328 # 4		SUPPLY OF VARIOUS SMALL PARTS FOR WORKSHOP	$ 12.00	
03/08/2020	**2583.1521-01**	**Dial A Nappy & Busiclean**	**GOODS**		**$ 1,568.90**
21/07/2020	INV-12068		CLEANING CHEMICALS FOR SCFC	$ 362.00	
28/07/2020	INV-12158		CLEANING CHEMICALS FOR SCFC	$ 1,206.90	
03/08/2020	**2583.1689-01**	**Compsys Pty Ltd T/A Harmony Software**	**SOFTWARE EXPENSES**		**$ 528.00**
16/07/2020	3-597		SOFTWARE SUBSCRIPTIONS	$ 528.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
03/08/2020	**2583.189-01**	**LGISWA**	**INSURANCE**		**$ 444,990.35**
30/07/2020	100-139322		INSURANCE PREMIUM 2020/2021 - MOTOR VEHICLE FLEET	$ 88,833.45	
30/07/2020	100-139022		INSURANCE PREMIUM 2020/2021 - LGIS LIABILITY	$ 36,760.39	
30/07/2020	100-139320		INSURANCE PREMIUM 2020/2021 - LGIS PROPERTY	$ 86,427.34	
30/07/2020	100-139325		INSURANCE PREMIUM 2020/2021 - LGIS WORKCARE	$ 157,722.64	
30/07/2020	100-139125		INSURANCE PREMIUM 2020/2021- COMMERCIAL CRIME & CYBER LIABILITY	$ 12,914.50	
30/07/2020	100-139075		INSURANCE PREMIUM 2020/2021 - LGIS BUSHFIRE	$ 37,587.00	
30/07/2020	100-139324		INSURANCE PREMIUM 2020/2021 - CORPORATE TRAVEL	$ 825.00	
30/07/2020	100-139323		INSURANCE PREMIUM 2020/2021 - PERSONAL ACCIDENT	$ 467.50	
30/07/2020	100-139321		INSURANCE PREMIUM 2020/2021 - MANAGEMENT LIABILITY	$ 23,452.53	
03/08/2020	**2583.21-01**	**Eastern Metropolitan Regional Council**	**TRANSFER STATION FEES**		**$ 44,781.53**
27/07/2020	EMRC35111		TRANSFER STATION FEES	$ 44,781.53	
03/08/2020	**2583.254-01**	**Mundaring Arts Centre Inc**	**ANNUAL FUNDING**		**$ 181,337.00**
21/07/2020	1252		ANNUAL FUNDING 2020/2021	$ 181,337.00	
03/08/2020	**2583.2625-01**	**Stewart & Heaton Clothing Co**	**UNIFORMS**		**$ 228.56**
10/07/2020	SIN-3222667		UNIFORMS - CHIDLOW VBFB	$ 228.56	
03/08/2020	**2583.2737-01**	**Du Clene Pty Ltd**	**CLEANING**		**$ 66,610.31**
30/07/2020	00009982		CLEANING SERVICES	$ 66,610.31	
03/08/2020	**2583.2741-01**	**Hills Seafood Supplies**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 345.66**
27/07/2020	84381		PROVISIONS FOR REFLECTIONS CAFE	$ 345.66	
03/08/2020	**2583.280-01**	**Winc Australia Pty Limited**	**STATIONERY**		**$ 539.90**
17/07/2020	9033113547		STATIONERY ITEMS	$ 539.90	
03/08/2020	**2583.3088-01**	**Local Government Professionals**	**SUBSCRIPTIONS**		**$ 1,778.00**
31/07/2020	17387		AFFILIATE MEMBERSHIP 2020/2021 - MGR LIBRARIES & COMMUNITY ENGAGEMENT	$ 185.00	
14/07/2020	17594		MEMBERSHIP SUBSCRIPTION 2020/2021 MANAGER FINANCE	$ 531.00	
14/07/2020	17743		MEMBERSHIP SUBSCRIPTION 2020/2021 DIRECTOR CORPORATE SERVICES	$ 531.00	
28/07/2020	17616		MEMBERSHIP SUBSCRIPTION 2020/2021 - DIRECTOR STRATEGIC & COMMUNITY SERVICES	$ 531.00	
03/08/2020	**2583.3232-01**	**Turfworks WA Pty Ltd**	**MOWING**		**$ 5,977.70**
24/07/2020	4855		MOWING SERVICES	$ 2,202.19	
24/07/2020	4856		MOWING SERVICES	$ 2,101.71	
24/07/2020	4857		MOWING SERVICES	$ 1,673.80	
03/08/2020	**2583.381-01**	**Mundaring Electrical Contracting Se**	**ELECTRICAL SERVICES**		**$ 1,857.90**
31/07/2020	7113		ELECTRICAL SERVICES - SAWYERS VALLEY OVAL CHANGE ROOMS	$ 154.00	
31/07/2020	7117		ELECTRICAL SERVICES - DARLINGTON PAVILION	$ 489.50	
28/07/2020	7111		ELECTRICAL SERVICES - ADMIN BUILDING	$ 132.00	
31/07/2020	7116		ELECTRICAL SERVICES - ADMIN BUILDING	$ 99.00	
31/07/2020	7115		ELECTRICAL SERVICES - WOOROLOO PUBLIC TOILETS	$ 786.50	
31/07/2020	7107		ELECTRICAL SERVICES - LITTLE POSSUMS DAY CARE CENTRE	$ 196.90	
03/08/2020	**2583.4162-01**	**Advance Press (2013) Pty Ltd**	**PRINTING**		**$ 803.00**
09/07/2020	144822		PRINTING MONTHLY COVID-19 NEWSLETTER JUNE 2020	$ 803.00	
03/08/2020	**2583.4407-01**	**Aardvark Bobcat & Truck Hire**	**HIRE OF PLANT**		**$ 3,340.66**
28/07/2020	#768		HIRE OF PLANT	$ 3,340.66	
03/08/2020	**2583.4453-01**	**Technifire 2000**	**PARTS**		**$ 3,753.92**
10/07/2020	23910		REPAIRS TO CHIDLOW 4.4R 072MDG	$ 3,753.92	
03/08/2020	**2583.4526-01**	**Mr J S Daw**	**REIMBURSEMENT**		**$ 763.88**
28/07/2020	TRAVEL		TRAVEL & FOOD REIMBURSEMENT 1014KM 19/03/2020 - 21/07/2020	$ 763.88	
03/08/2020	**2583.4749-01**	**Pure Air Filters**	**PARTS**		**$ 180.40**
30/07/2020	00012356		AIR FILTER CLEANERS FOR ASSORTED VEHICLES	$ 180.40	
03/08/2020	**2583.52-01**	**Western Educting Service**	**HIRE OF PLANT**		**$ 8,569.87**
28/07/2020	00000874		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,612.61	
28/07/2020	00000875		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,658.69	
28/07/2020	00000876		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,842.98	
28/07/2020	00000872		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,842.98	
28/07/2020	00000873		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,612.61	
03/08/2020	**2583.5390-01**	**WA Naturally Publications**	**VISITOR CENTRE STOCK**		**$ 699.24**
16/07/2020	P 1-01-028977		ASSORTED MAPS FOR VISITOR CENTRE STOCK	$ 699.24	
03/08/2020	**2583.599-01**	**Mundaring Adult Creative & Learning**	**ANNUAL FUNDING**		**$ 9,100.00**
23/07/2020	210720		ANNUAL FUNDING 1ST QUARTER CLAIM 2020/2021	$ 9,100.00	
03/08/2020	**2583.6050-01**	**Fuel Distributors of Western Austra**	**FUEL & OILS**		**$ 15,812.64**
30/07/2020	54100750		DIESEL FUEL	$ 15,812.64	
03/08/2020	**2583.6732-01**	**Relationships Australia Western**	**EMPLOYEE ASSISTANCE PROGRAM**		**$ 165.00**
24/07/2020	00350755		EMPLOYEE ASSISTANCE PROGRAM	$ 165.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
03/08/2020	**2583.7426-01**	**Scoob's Dingo Service**	**FOOTPATH SWEEPING / MAINTENANCE**		**$ 2,945.25**
28/07/2020	2378		FOOTPATH SWEEPING / MAINTENANCE	$ 2,945.25	
03/08/2020	**2583.7738-01**	**WA Safety Products (Montyanne Trust**	**SAFETY EQUIPMENT**		**$ 28.55**
28/07/2020	A1483		SUPPLY 1 X TRIPPING HAZARD METAL WARNING SIGN	$ 28.55	
03/08/2020	**2583.793-01**	**The Katharine Susannah Prichard**	**GRANT**		**$ 16,091.00**
21/07/2020	121026		QUARTERLY GRANT FUNDING - JULY TO SEPTEMBER 2020	$ 16,091.00	
03/08/2020	**2583.80-01**	**Bunnings Group Limited**	**HARDWARE**		**$ 115.23**
24/07/2020	2180/01554506		HARDWARE ITEMS	$ 115.23	
03/08/2020	**2583.8037-01**	**Electritech Industries**	**ELECTRICAL SERVICES**		**$ 1,137.90**
24/07/2020	13340		ELECTRICAL SERVICES - BRUCE DOUGLAS PAVILION	$ 1,137.90	
03/08/2020	**2583.8051-01**	**Conquest Earthworks**	**RUBBLE REMOVAL**		**$ 24,585.00**
23/07/2020	1063		RUBBLE REMOVAL SERVICES - MATHIESON RD TRANSFER STATION	$ 24,585.00	
03/08/2020	**2583.8275-01**	**E Fire & Safety**	**ROUTINE MAINTENANCE**		**$ 891.00**
23/07/2020	525120		SERVICING OF DEPOT VEHICLE FIRE EXTINGUISHERS	$ 891.00	
03/08/2020	**2583.8367-01**	**Action Laser Cutting Pty Ltd**	**FABRICATION WORKS**		**$ 221.89**
10/07/2020	184962		CUTTING STAINLESS PLATES - NICHE WALLS MUNDARING CEMETERY	$ 221.89	
03/08/2020	**2583.8677-01**	**Airlite Cleaning**	**MONTHLY SERVICE SANITARY BINS**		**$ 446.80**
30/07/2020	352072		MONTHLY SERVICE SANITARY BINS	$ 446.80	
03/08/2020	**2583.9498-01**	**Toyota Material Handling Australia**	**PARTS**		**$ 151.35**
09/07/2020	215005190		SUPPLY 1 X BLOCK ASSY FUSIBLE FOR 009MDG	$ 151.35	
03/08/2020	**2583.9596-01**	**Brice Pest Management**	**PEST CONTROL**		**$ 264.00**
30/07/2020	IV03848		REMOVE BEES FROM TREES - HELENA VALLEY SHOPPING CENTRE	$ 264.00	
03/08/2020	**2584.10464-01**	**Swan Districts Football Club Inc**	**GRANT**		**$ 11,000.00**
03/08/2020	GRANT		YOUTH ENGAGEMENT PARTNERSHIP FUNDING GRANT	$ 11,000.00	
03/08/2020	**2584.13142-01**	**Little Possums Early Years**	**REFUND**		**$ 171.00**
31/07/2020	REFUND		REFUND - ELECTRICAL REPAIRS 3 CRAIGIE PLACE MUNDARING	$ 171.00	
03/08/2020	**2584.13447-01**	**Ms P E Biddle**	**REFUND**		**$ 120.00**
28/07/2020	REFUND		REFUND - OVERPAYMENT OF INFRINGEMENT BY DIRECT DEBIT	$ 120.00	
03/08/2020	**2584.13455-01**	**Mr D Pitcher**	**REFUND**		**$ 250.00**
31/07/2020	REFUND		REFUND - FOOD BUSINESS LICENCE PAID TWICE BY MISTAKE	$ 250.00	
03/08/2020	**2584.174-01**	**Synergy**	**ELECTRICITY**		**$ 15,057.89**
16/07/2020	5183606212		ELECTRICITY	$ 524.28	
16/07/2020	1877395520		ELECTRICITY	$ 767.20	
16/07/2020	2686554727		ELECTRICITY	$ 838.41	
16/07/2020	5100198416		ELECTRICITY	$ 508.78	
16/07/2020	5145475816		ELECTRICITY	$ 1,878.06	
16/07/2020	3671966720		ELECTRICITY	$ 7,030.58	
17/07/2020	9099006524		ELECTRICITY	$ 125.87	
17/07/2020	5039289513		ELECTRICITY	$ 436.83	
17/07/2020	6775766728		ELECTRICITY	$ 507.77	
17/07/2020	4079099529		ELECTRICITY	$ 118.27	
21/07/2020	9370568529		ELECTRICITY	$ 184.61	
21/07/2020	1244788225		ELECTRICITY	$ 233.61	
21/07/2020	5166165229		ELECTRICITY	$ 331.32	
21/07/2020	5056988325		ELECTRICITY	$ 1,335.92	
21/07/2020	2869138323		ELECTRICITY	$ 133.71	
21/07/2020	5358804327		ELECTRICITY	$ 102.67	
03/08/2020	**2584.196-01**	**Glen Forrest Volunteer Bushfire Brigade**	**REIMBURSEMENT**		**$ 642.58**
31/07/2020	02/2020		REIMBURSEMENT ESL EXPENSES FEBRUARY TO JUNE 2020	$ 642.58	
03/08/2020	**2584.318-01**	**Sawyers Valley Volunteer Bushfire**	**REIMBURSEMENT**		**$ 958.21**
31/07/2020	G18		REIMBURSEMENT ESL EXPENSES FEBRUARY TO APRIL 2020	$ 958.21	
03/08/2020	**2584.589-01**	**Shire of Mundaring**	**FDC PARENT LEVY**		**$ 13,774.25**
31/07/2020	300720		FDC PARENT LEVY	$ 13,774.25	
03/08/2020	**2584.8036-01**	**Ms M R Ponnan**	**REIMBURSEMENT**		**$ 1,368.37**
28/07/2020	REIMBURSEMENT		REIMBURSEMENT - HOME INTERNET ALLOWANCE	$ 360.00	
28/07/2020	REIMBURSEMENT		REIMBURSEMENT - WA IT LEADERSHIP SUMMIT REGISTRATION	$ 1,008.37	
06/08/2020	**2585.13461-01**	**Mrs C A Biesse**	**REFUND**		**$ 110.00**
06/08/2020	REFUND		REFUND - CANCELLED CHEQUE 400764	$ 110.00	
06/08/2020	**2585.13462-01**	**The Recovery Portal Ltd**	**REFUND**		**$ 110.00**
06/08/2020	REFUND		REFUND - CANCELLED CHEQUE 400651	$ 110.00	
06/08/2020	**2585.13463-01**	**Ms C Bradley**	**REFUND**		**$ 330.00**
06/08/2020	REFUND		REFUND - CANCELLED CHEQUE 400663	$ 330.00	

NAB Purchase Card Payments List for July 2020

Date	Supplier	Description		Amount	Card User
27-Jul-20	Bunnings 318000	Water Storage 10L Carrier - COVID-19		$ 25.96	Mr J M Neale
27-Jul-20	Angus & Robertson	Local Book Stock - KSP Library		$ 1,115.03	Ms K L Martin
28-Jul-20	Mount Helena Hardware	Hardware Items - Mt Helena Public Toilets Maintenance		$ 55.29	Mr J M Neale
28-Jul-20	Supa IGA Midland	Dishwashing Tablets - MECPC		$ 22.00	Mrs S E Broad
28-Jul-20	West Australian Newspapers Limited	WA Newspapers - Libraries		$ 88.95	Ms K L Martin
28-Jul-20	Harvey Norman AV/IT Superstore Midland	Sunbeam Rice cookers x2 - MECPC		$ 105.52	Ms S Harlow
28-Jul-20	Down To Earth Garden Supplies	Sand for sandpits - MECPC		$ 48.00	Ms J A Gray
29-Jul-20	Kmart 1052	Balls for children's play session - ERFDC		$ 18.00	Mrs A Tomizzi
29-Jul-20	Subway Mundaring	Catering - Resident & Ratepayer Forum		$ 135.60	Mrs P Heath
29-Jul-20	Angus & Robertson	Book stock - AFM Library		$ 570.79	Ms H McKissock
29-Jul-20	JBHiFi.com.au	DVD & CD stock - AFM Library		$ 99.93	Ms H McKissock
29-Jul-20	Boffins Books	Book stock - AFM Library		$ 39.40	Ms H McKissock
29-Jul-20	Shire of Mundaring	Test - RMS Lake Leschenaultia Camp Booking Refund	REFUND	-$ 60.00	Mr S D Winfield
29-Jul-20	Shire of Mundaring	Test - RMS Lake Leschenaultia Camp Booking		$ 60.00	Mr S D Winfield
29-Jul-20	Shire of Mundaring	Test - RMS Lake Leschenaultia Camp Booking Refund	REFUND	-$ 20.00	Mr S D Winfield
29-Jul-20	Shire of Mundaring	Test - RMS Lake Leschenaultia Camp Booking		$ 20.00	Mr S D Winfield
29-Jul-20	Shire of Mundaring	Test - RMS Lake Leschenaultia Camp Booking Refund	REFUND	-$ 6.80	Mr S D Winfield
29-Jul-20	Shire of Mundaring	Test - RMS Lake Leschenaultia Camp Booking		$ 6.80	Mr S D Winfield
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 51.90	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 43.25	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 35.75	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 34.50	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 32.99	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 28.50	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 28.35	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 26.75	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 26.25	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 25.75	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 24.75	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 24.50	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 24.50	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 23.25	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 18.90	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 18.90	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 18.75	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 17.25	Ms K L Martin
29-Jul-20	Angus & Robertson	Credit error in online order	REFUND	-$ 17.25	Ms K L Martin
29-Jul-20	Curtin University of Technology	Leadership in Early Education and Care training - MECPC		$ 90.00	Ms S Harlow
30-Jul-20	Campaign Monitor	Bulk Email - Volunteer Bulletin July 2020		$ 25.32	Mrs P Heath
30-Jul-20	Campaign Monitor	Bulk Email - Newsletter What's on August 2020		$ 23.01	Ms M A Yasbincek
30-Jul-20	Harvey Norman AV/IT Malaga	Breville Sandwich press x2 - MECPC		$ 198.00	Ms S Harlow
31-Jul-20	Campaign Monitor	Bulk Email - Story & Rhyme Time Update		$ 12.58	Ms M A Yasbincek
1-Aug-20	Woolworths 4313	Playgroup morning teas - SC & PC Middle Swan		$ 39.80	Ms R B McAllister
2-Aug-20	N & E Cleaning Pty Ltd	Carwash Services - MECPC		$ 16.00	Ms S Harlow
3-Aug-20	Apple Pty Ltd	IPhone/iPad charger - Health		$ 74.00	Mr M J Shurlock
4-Aug-20	Planning Institute of Australia	Planning Subscription Renewal		$ 632.00	Mr M R Luzi

NAB Purchase Card Payments List for July 2020

Date	Supplier	Description		Amount	Card User
4-Aug-20	Coles 0398	Consumables for Children's Services building		$ 27.59	Mrs A Tomizzi
4-Aug-20	Flowerpack	Materials for NAIDOC activity		$ 35.96	Ms R B McAllister
4-Aug-20	Spotlight 058	Art resources - MECPC		$ 55.00	Ms S Harlow
5-Aug-20	Dieback Working Group Inc.	Dieback Information Group Conference		$ 210.50	Mrs E M Pinnock
5-Aug-20	Zoom Video Communications Inc.	Account for school holiday program - AFM & KSP Library		$ 23.09	Ms M A Yasbincek
6-Aug-20	JBHiFi.com.au	DVD & CD Stock - AFM Library		$ 258.80	Ms H McKissock
6-Aug-20	Wokinabox Stratton	Catering - Agency lunch & networking session		$ 199.13	Ms R B McAllister
6-Aug-20	Jaycar Electronics Midland	Scales to measure powdered herbicides		$ 69.95	Mr D L O'Brien
6-Aug-20	Angus & Robertson	Book Stock - AFM Library		$ 241.65	Ms H McKissock
6-Aug-20	BP Morrison Rd 6092	Barbeque gas bottle swap		$ 29.00	Ms R B McAllister
6-Aug-20	Angus & Robertson	Book Stock - KSP Library		$ 395.65	Ms K L Martin
6-Aug-20	Swan View IGA	Consumables for Children's Services building		$ 42.00	Mrs A Tomizzi
7-Aug-20	Sign Supermarket	Plain white sticker to adjust revegetation signage		$ 10.00	Mr D L O'Brien
7-Aug-20	St John Ambulance Australia	First Aid training - Kerryn Martin - MECPC		$ 199.00	Ms S Harlow
8-Aug-20	Kmart 1004	Sports equipment - MECPC		$ 45.30	Ms S Harlow
10-Aug-20	Mt Helena Hardware	Hardware Items - Admin Building Maintenance		$ 16.90	Mr J M Neale
10-Aug-20	Tony's House of Tender meats	Meat for children - MECPC		$ 814.47	Mrs S E Broad
10-Aug-20	JBHiFi.com.au	Junior stock - AFM library		$ 113.85	Ms M A Yasbincek
10-Aug-20	Angus & Robertson	Junior stock - AFM Library		$ 547.75	Ms M A Yasbincek
10-Aug-20	Angus & Robertson	Junior stock - KSP Library		$ 546.25	Ms M A Yasbincek
11-Aug-20	Officeworks 0611	Archive boxes & highlighters - KSP Library		$ 26.63	Ms K L Martin
11-Aug-20	Mt Helena Hardware	Toilet Seat - Mt Helena Public Toilets		$ 29.95	Mr J M Neale
11-Aug-20	Subway Mundaring	Catering - Council Forum 11th August 2020		$ 90.75	Ms M M Thomas
12-Aug-20	Officeworks Online Bentleigh	Square Bifold Table - Events		$ 135.00	Ms M M Thomas
12-Aug-20	Officeworks Online Bentleigh	Floor Standing Hand Sanitiser Dispenser		$ 219.00	Ms M M Thomas
12-Aug-20	Officeworks Online Bentleigh	Square bifold table - events		$ 90.00	Ms M M Thomas
12-Aug-20	DuluxGroup (Australia) Pty Ltd	Paint Supplies - Bus Shelter Maintenance		$ 85.13	Mr J M Neale
12-Aug-20	Mt Helena Hardware	Hardware Items - Graffiti removal		$ 16.98	Mr J M Neale
12-Aug-20	Angus & Robertson	Book Stock - KSP Library		$ 329.39	Ms K L Martin
12-Aug-20	North Street Pharmacy	Hand Sanitiser - MECPC		$ 89.70	Ms J A Gray
13-Aug-20	JBHiFi.com.au	DVD & CD Stock - AFM Library		$ 186.47	Ms H McKissock
13-Aug-20	Mega Office Supplies	Dymo Rhino 4200 Labeller		$ 207.59	Mr A M Currell
13-Aug-20	Angus & Robertson	Book Stock - AFM Library		$ 483.20	Ms H McKissock
13-Aug-20	Puma Energy Mundaring	Used for personal expense in error - Amount has been paid back to the Shire		$ 42.45	Ms M Beley
13-Aug-20	Zoom Video Communications Inc.	Refund - Cancelled online program	REFUND	-$ 23.09	Ms M A Yasbincek
13-Aug-20	Zoom Video Communications Inc.	Refund - unused account	REFUND	-$ 23.09	Ms M A Yasbincek
13-Aug-20	Tony's Auto Wreckers	Rear Tail light for P4786		$ 198.00	Mr R Haripersad
14-Aug-20	Angus & Robertson	Book Stock - AFM Library		$ 94.49	Ms H McKissock
14-Aug-20	Swan Valley Gourmet Deli	Card for volunteer - MECPC		$ 4.99	Ms J A Gray
14-Aug-20	Gilberts Fresh Market Midland	Flowers for volunteer - MECPC		$ 39.99	Ms J A Gray
17-Aug-20	Coles 0485	Food for children - MECPC		$ 69.02	Ms S Harlow
17-Aug-20	St John Ambulance Australia	Service First Aid Kits - MECPC		$ 118.79	Ms S Harlow
17-Aug-20	The Plantafe	Catering - Council Forum on 17 August 2020		$ 194.85	Ms M M Thomas
18-Aug-20	Coles 0330	Replacement kettle - Mundaring Visitor Centre		$ 26.00	Ms B M Beale
18-Aug-20	Coles 0278	Allergy resources - MECPC		$ 5.00	Ms S Harlow
18-Aug-20	Kmart 1052	Resources for educators - MECPC		$ 41.15	Ms S Harlow
19-Aug-20	JBHiFi.com.au	DVD Stock - AFM Library		$ 163.88	Ms H McKissock

NAB Purchase Card Payments List for July 2020

Date	Supplier	Description	Amount	Card User
19-Aug-20	Wilson Parking Australia	Parking Fee - IAP Training	$ 19.20	Ms M R Griffiths
19-Aug-20	Subway Mundaring	Catering - EAC Meeting	$ 68.65	Mr M R Luzi
19-Aug-20	Angus & Robertson	Book Stock - AFM Library	$ 357.85	Ms H McKissock
19-Aug-20	Mount Helena Hardware	Concrete for signage	$ 34.40	Mr J M Neale
20-Aug-20	The Stationery Co Midvale	Key tags for facility keys - R&L	$ 43.80	Mrs P Heath
20-Aug-20	Woolworths 4337	Program Promotion Consumables	$ 16.00	Mrs J A Pearce
20-Aug-20	Big W 0443	Parenting Program Consumables	$ 28.00	Mrs J A Pearce
20-Aug-20	Seek Limited	Job Advertisement - Diploma Qualified Early Childhood Educator	$ 282.70	Ms M M Thomas
20-Aug-20	Officeworks 0611	Pound Supplies - Gloves	$ 29.90	Mr C M Cuthbert
20-Aug-20	The Reject Shop 6637	Parenting Program Consumables	$ 35.50	Mrs J A Pearce
20-Aug-20	Work in it Pty Ltd	Program Promotion Consumables	$ 239.25	Mrs J A Pearce
21-Aug-20	Ikea Perth	Children's activity & play equipment - SCFC	$ 564.97	Ms R B McAllister
24-Aug-20	Officeworks Online Bentleigh	Stationery Items - KSP Library	$ 63.90	Ms K L Martin
24-Aug-20	Mount Helena Hardware	Paint Supplies - Remove Graffiti	$ 69.00	Mr J M Neale
24-Aug-20	Angus & Robertson	Book Stock - KSP Library	$ 494.85	Ms K L Martin
24-Aug-20	City of Swan	Building plans to update licence - MECPC	$ 164.90	Ms S Harlow
24-Aug-20	Bunnings 318000	Gloves - Pound supplies	$ 23.96	Mr C M Cuthbert
25-Aug-20	Coles 0278	Baby wipes - MECPC	$ 60.00	Ms J A Gray
25-Aug-20	Subway Mundaring	Catering - MFS AGM	$ 154.00	Mrs J R Banks
25-Aug-20	Subway Mundaring	Catering - Civica Animal Module Training	$ 64.50	Mr C M Cuthbert
26-Aug-20	JBHiFi.com.au	DVD stock - AFM Library	$ 223.86	Ms H McKissock
26-Aug-20	Big W 0448	Children's activities - SC & PC Middle Swan	$ 64.00	Ms R B McAllister
26-Aug-20	Cash Register Warehouse	Epson TM-T82iii Receipt Printer - Depot	$ 345.50	Mr A M Currell
26-Aug-20	Woolworths 4312	LT Catering - LGMC Presentation	$ 54.15	Ms M M Thomas
27-Aug-20	GiVV Technologies Ltd	Midland Gate Gift Card - Volunteer Deon Nginette	$ 202.50	Ms R B McAllister
27-Aug-20	Pizza Hut Swan View	Networking Lunch - Child & Health speech	$ 71.75	Ms R B McAllister
27-Aug-20	Midland Auto One	Gift Card - Volunteer Deon Nginette	$ 100.00	Ms R B McAllister
		Total Purchase Card Payments	**$ 13,614.29**	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
06/08/2020	**2585.858-01**	**Eastern Hills Netball Association**	**REFUND**		**$ 55.00**
06/08/2020	REFUND		REFUND - CANCELLED CHEQUE 400698	$ 55.00	
06/08/2020	**2586.3462-01**	**Care Giver Subsidies**	**CARE GIVER SUBSIDIES**		**$ 35,637.55**
07/08/2020	060820		CARE GIVER SUBSIDIES	$ 35,637.55	
07/08/2020	**2587.34-01**	**Water Corporation**	**WATER RATES & FEES**		**$ 4,010.79**
07/08/2020	9013212898		WATER RATES & FEES	$ 105.76	
07/08/2020	9004688851		WATER RATES & FEES	$ 1,840.19	
07/08/2020	9004580154		WATER RATES & FEES	$ 10.07	
07/08/2020	9004566571		WATER RATES & FEES	$ 316.91	
07/08/2020	9004566600		WATER RATES & FEES	$ 1,267.50	
07/08/2020	9004656446		WATER RATES & FEES	$ 25.18	
07/08/2020	9004674708		WATER RATES & FEES	$ 35.25	
07/08/2020	9004668084		WATER RATES & FEES	$ 7.05	
07/08/2020	9004686864		WATER RATES & FEES	$ 5.04	
07/08/2020	9004686215		WATER RATES & FEES	$ 390.29	
07/08/2020	9004690281		WATER RATES & FEES	$ 7.55	
07/08/2020	**2588.11205-01**	**Mr J S Martin**	**REFUND**		**$ 110.00**
07/08/2020	1228174		HALL BOND REFUND	$ 110.00	
07/08/2020	**2588.13464-01**	**Mundaring Garden Club**	**REFUND**		**$ 55.00**
07/08/2020	480490		KEY BOND REFUND	$ 55.00	
07/08/2020	**2588.13465-01**	**Ms K L Byrne**	**REFUND**		**$ 110.00**
07/08/2020	1229438		HALL BOND REFUND	$ 110.00	
07/08/2020	**2588.13466-01**	**Ms D M Francis**	**REFUND**		**$ 110.00**
07/08/2020	1230362		HALL BOND REFUND	$ 110.00	
07/08/2020	**2588.13467-01**	**Mrs J A Sheil**	**REFUND**		**$ 65.00**
07/08/2020	1230568		KEY BOND REFUND	$ 65.00	
07/08/2020	**2588.3764-01**	**Mrs K L Duncan**	**REFUND**		**$ 44.00**
07/08/2020	1228187		KEY BOND REFUND	$ 44.00	
07/08/2020	**2588.5810-01**	**Mrs M J Oliver**	**REFUND**		**$ 110.00**
07/08/2020	1228049		HALL BOND REFUND	$ 110.00	
07/08/2020	**2589.13468-01**	**Mr B A Dalgleish**	**REFUND**		**$ 15,264.85**
07/08/2020	1089510		UNCOMPLETED WORKS BOND REFUND	$ 15,264.85	
10/08/2020	**2590.10904-01**	**Split Horizon Pty Ltd**	**CISCO MOBILE & REMOTE ACCESS IMPLEMENTATION**		**$ 9,900.00**
30/06/2020	INV001007		CISCO MOBILE & REMOTE ACCESS IMPLEMENTATION	$ 9,900.00	
10/08/2020	**2590.1111-01**	**Zipform Pty Ltd**	**POSTAGE FEES**		**$ 19,045.35**
07/08/2020	198112		SHIRE OF MUNDARING 2020/2021 ANNUAL RATES POSTAGE FEES	$ 19,045.35	
10/08/2020	**2590.11135-01**	**Frontline Fire & Rescue Equipment**	**EQUIPMENT PURCHASES**		**$ 1,269.69**
17/07/2020	68309		EQUIPMENT PURCHASES - DARLINGTON VBFB	$ 245.31	
17/07/2020	68311		EQUIPMENT PURCHASES - GLEN FORREST VBFB	$ 441.05	
17/07/2020	68310		EQUIPMENT PURCHASES - WOOROLOO VBFB	$ 583.33	
10/08/2020	**2590.11205-01**	**Mr J S Martin**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.11210-01**	**Mr D A Jeans**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.11452-01**	**S and I Services (Sneska Ilikj T/A)**	**CLEANING**		**$ 320.00**
04/08/2020	182		CLEANING SERVICES	$ 320.00	
10/08/2020	**2590.11473-01**	**Choices Flooring By Gundry's (Gundr**	**FLOORING**		**$ 6,855.00**
07/08/2020	302604		SUPPLY & INSTALL VINYL FLOORING - MUNDARING ADULT LEARNING CENTRE	$ 6,855.00	
10/08/2020	**2590.11474-01**	**Swan Valley Fresh (Vendor Management**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 109.37**
03/08/2020	00029140		PROVISIONS FOR REFLECTIONS CAFE	$ 109.37	
10/08/2020	**2590.11649-01**	**Claremont Pool Service**	**EQUIPMENT SERVICE & REPAIR S**		**$ 1,468.01**
07/08/2020	SIN174269		SERVICE & REPAIR DOLPHINE WAVE POOL CLEANER	$ 1,468.01	
10/08/2020	**2590.11751-01**	**Para-Quad Industries (Alinea Inc T/**	**DELIVERY SERVICE**		**$ 6,426.42**
14/07/2020	INV7446		LIBRARY VAN DELIVERY SERVICE	$ 6,426.42	
10/08/2020	**2590.11784-01**	**Mrs A E Collins**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.11921-01**	**Mundaring Smash Repairs (WA Panel W**	**VEHICLE REPAIRS**		**$ 2,082.67**
24/07/2020	66858		REPAIRS TO 829MDG	$ 2,082.67	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
10/08/2020	**2590.12-01**	**Department of Human Services - Child**	**CHILD SUPPORT PAYMENT**		**$ 213.09**
02/08/2020	PY02-03-CHILD SU		CHILD SUPPORT PAYMENT	$ 213.09	
10/08/2020	**2590.12027-01**	**AFGRI Equipment Australia Pty Ltd**	**PARTS**		**$ 289.79**
16/07/2020	1944529		SUPPLY 3 X IDLER PULLEYS FOR 00MDG	$ 200.26	
16/07/2020	1944605		SUPPLY 1 X IDLER PULLEY FOR 00MDG	$ 89.53	
10/08/2020	**2590.12136-01**	**Mr D P Hayes**	**DESIGN WORKS**		**$ 500.00**
07/08/2020	1074		UPDATE SHIRE OF MUNDARING MONTHLY NEWSLETTER	$ 200.00	
07/08/2020	1073		DESIGN COVID-19 RELIEF & RECOVERY FUND POSTER	$ 300.00	
10/08/2020	**2590.12185-01**	**Biobean Coffee Pty Ltd**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 600.03**
21/07/2020	00001058		PROVISIONS FOR REFLECTIONS CAFE	$ 494.54	
24/07/2020	00001111		PROVISIONS FOR REFLECTIONS CAFE	$ 105.49	
10/08/2020	**2590.12267-01**	**Miss K Driver**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.12268-01**	**Mr I R Green**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.12269-01**	**Mr J Russell**	**COUNCILLOR ALLOWANCE**		**$ 3,208.09**
01/08/2020	DSP ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 1,120.00	
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.12377-01**	**Healey Engineering Pty Ltd**	**ENERGY ASSESSMENT**		**$ 4,290.00**
23/07/2020	1749-003-01		CARRY OUT ENERGY ASSESSMENT COPPIN RD TRANSFER STATION	$ 4,290.00	
10/08/2020	**2590.12388-01**	**Mint Civil T/A Kalamunda Sweeping**	**STREET SWEEPING SERVICES**		**$ 7,329.50**
14/07/2020	M 2553		SUPPLY OF STREET SWEEPING SERVICES	$ 3,939.75	
14/07/2020	M 2556		SUPPLY OF STREET SWEEPING SERVICES	$ 3,389.75	
10/08/2020	**2590.12422-01**	**MDM Plumbing and Gas**	**PLUMBING**		**$ 945.95**
07/08/2020	1288		REPAIR BURST PIPE - LAKE LESCHENAULTIA	$ 945.95	
10/08/2020	**2590.12470-01**	**Mr G Wood**	**FENCING**		**$ 2,508.00**
31/07/2020	IV00000000042		SUPPLY & INSTALL RAILING - AMHERST RD SWAN VIEW	$ 2,508.00	
10/08/2020	**2590.12579-01**	**Mr V Crowe**	**LANDSCAPE, MAINTENANCE & CLEANING SERVICES**		**$ 980.00**
04/08/2020	1517		LANDSCAPE SERVICES	$ 210.00	
04/08/2020	1518		CLEANING SERVICES	$ 210.00	
04/08/2020	1519		LANDSCAPE SERVICES	$ 210.00	
04/08/2020	1520		LANDSCAPE & MAINTENANCE SERVICES	$ 350.00	
10/08/2020	**2590.12677-01**	**Snap Midland (Debandkas Assets Pty**	**DESIGN WORKS**		**$ 800.00**
17/07/2020	F069-206760		DESIGN & CREATE PLANTS OUT OF PLACE (WEED) BOOKLET	$ 800.00	
10/08/2020	**2590.127-01**	**Volich Waste Contractors Pty Ltd**	**REFUSE CONTRACT**		**$ 133,716.58**
07/08/2020	00005649		REFUSE CONTRACT	$ 220.00	
07/08/2020	00005650		REFUSE CONTRACT	$ 104,891.60	
07/08/2020	00005651		REFUSE CONTRACT	$ 2,673.44	
07/08/2020	00005652		REFUSE CONTRACT	$ 5,829.67	
07/08/2020	00005653		REFUSE CONTRACT	$ 10,267.18	
07/08/2020	00005654		REFUSE CONTRACT	$ 550.00	
07/08/2020	00005655		REFUSE CONTRACT	$ 136.40	
07/08/2020	00005656		REFUSE CONTRACT	$ 358.16	
07/08/2020	00005657		REFUSE CONTRACT	$ 574.96	
07/08/2020	00005658		REFUSE CONTRACT	$ 627.44	
07/08/2020	00005659		REFUSE CONTRACT	$ 7,587.73	
10/08/2020	**2590.12794-01**	**Mount Helena Hardware**	**HARDWARE ITEMS**		**$ 114.51**
20/07/2020	15882		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 62.36	
30/07/2020	15381		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 16.80	
30/07/2020	15551		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 13.90	
30/07/2020	15677		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 21.45	
10/08/2020	**2590.12804-01**	**Mundaring Little Loads (The Trustee**	**GARDEN MIX**		**$ 84.00**
04/08/2020	2603		SUPPLY 3 SCOOPS OF GENERAL GARDEN MIX	$ 84.00	
10/08/2020	**2590.12847-01**	**Bell Art Australia**	**VISITOR CENTRE STOCK**		**$ 411.18**
07/08/2020	00005970		SUPPLY OF AUSTRALIAN ITEMS FOR VISITOR CENTRE STOCK	$ 411.18	
10/08/2020	**2590.12866-01**	**From Scratch Small Event Catering**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 54.00**
07/08/2020	975		PROVISIONS FOR REFLECTIONS CAFE	$ 54.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description		Amount		Total
10/08/2020	**2590.12899-01**	**NAPA (A Division of GPC Asia Pacific**	**WORKSHOP CONSUMABLES**			**$**	**347.87**
21/07/2020	1320081733		SUPPLY OIL FILTERS FOR P2483, P2500, P4814 & P2471	$	89.94		
21/07/2020	1320081954		SUPPLY OF WORKSHOP CONSUMABLES	$	69.41		
21/07/2020	1320082374		SUPPLY 12V WEDGE GLOBE FOR P1013	$	34.76		
21/07/2020	1320082443		SUPPLY OF WORKSHOP CONSUMABLES	$	24.82		
21/07/2020	1320082514		SUPPLY OF WORKSHOP CONSUMABLES	$	75.90		
21/07/2020	1320082646		SUPPLY OF WORKSHOP CONSUMABLES	$	53.04		
10/08/2020	**2590.12938-01**	**Aussie Broadband Pty Ltd**	**NBN & VOIP SERVICE CHARGES**			**$**	**447.65**
04/08/2020	8513257		VOIP SERVICES - 55 HARDEY ROAD	$	0.65		
16/07/2020	8468147		ROUTER FOR DARLING RANGES VBFB	$	149.00		
16/07/2020	8468156		ROUTER FOR SAWYERS VALLEY VBFB	$	149.00		
16/07/2020	8468159		ROUTER FOR MOUNT HELENA VBFB	$	149.00		
10/08/2020	**2590.12944-01**	**Avon Tree Management (Kajanni Pty L**	**MULCHING WORKS - MORGAN JOHN MORGAN**			**$**	**2,248.40**
07/08/2020	229		FORRESTRY MULCHING - BILGOMAN RD & THOMAS RD GLEN FORREST	$	2,248.40		
10/08/2020	**2590.13-01**	**Shire of Mundaring**	**PAYROLL DEDUCTION**			**$**	**9,228.27**
02/08/2020	PY01-03-Child Ca		PAYROLL DEDUCTION	$	1,899.86		
02/08/2020	PY01-03-Buy Addi		PAYROLL DEDUCTION	$	738.82		
02/08/2020	PY01-03-Novated		PAYROLL DEDUCTION	$	3,136.81		
02/08/2020	PY01-03-Novated		PAYROLL DEDUCTION	$	2,153.62		
02/08/2020	PY02-03-Private		PAYROLL DEDUCTION	$	150.00		
02/08/2020	PY02-03-Buy Addi		PAYROLL DEDUCTION	$	549.16		
02/08/2020	PY01-03-Private		PAYROLL DEDUCTION	$	600.00		
10/08/2020	**2590.13101-01**	**Mr M D Corica**	**COUNCILLOR ALLOWANCE**			**$**	**2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$	291.67		
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$	1,796.42		
10/08/2020	**2590.13109-01**	**Mr S A Cuthbert**	**COUNCILLOR ALLOWANCE**			**$**	**2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$	291.67		
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$	1,796.42		
10/08/2020	**2590.13249-01**	**Pool & Pump Service & Repairs Pty L**	**EQUIPMENT SERVICE & REPAIRS**			**$**	**247.50**
07/08/2020	100062		SERVICE & REPAIR POOL FILTRATION SYSTEM - BILGOMAN AQUATIC CENTRE	$	247.50		
10/08/2020	**2590.13268-01**	**Department of Human Services - The**	**CENTRELINK PAYMENT**			**$**	**107.96**
02/08/2020	PY01-03-Centreli		CENTRELINK PAYMENT	$	107.96		
10/08/2020	**2590.13345-01**	**ABM Landscaping (Mikevie Pty Ltd T/**	**LANDSCAPING**			**$**	**34,006.38**
04/08/2020	INV-0416		LANDSCAPE MAINTENANCE - SCULPTURE PARK & MORGAN JOHN MORGAN	$	3,531.00		
04/08/2020	INV-0417		LANDSCAPE MAINTENANCE - MUNDARING INFANT HEALTH CENTRE	$	104.50		
04/08/2020	INV-0418		LANDSCAPE MAINTENANCE - COMMUNITY CENTRES MUNDARING SHIRE	$	2,061.18		
04/08/2020	INV-0420		LANDSCAPE MAINTENANCE - GREAT EASTERN HIGHWAY	$	2,235.89		
04/08/2020	INV-0421		LANDSCAPE MAINTENANCE - MORRISON RD STREETSCAPE	$	3,861.07		
04/08/2020	INV-0423		LANDSCAPE MAINTENANCE - TRIANDRA DRIVE	$	274.08		
04/08/2020	INV-0419		LANDSCAPE MAINTENANCE - MUNDARING TOWN CENTRE	$	11,681.36		
04/08/2020	INV-0422		LANDSCAPE MAINTENANCE - HELENA VALLEY ESTATE	$	10,257.30		
10/08/2020	**2590.13368-01**	**Midland Nissan and Isuzu (Idom Midl**	**PARTS**			**$**	**156.34**
14/07/2020	62017174		SUPPLY R/H FRONT DOOR GLASS FOR 064MDG	$	156.34		
10/08/2020	**2590.13382-01**	**Plastic Wholesale**	**PROTECTIVE BOARDS**			**$**	**546.14**
30/07/2020	00012868		PROTECTIVE BOARDS OF HDPE - MUNDARING ARENA	$	546.14		
10/08/2020	**2590.13449-01**	**MGI Constructions Pty Ltd**	**CONSTRUCTION WORKS**			**$**	**18,450.00**
07/08/2020	00000382		SUPPLY & INSTALL NEW SHED - COPPIN RD TRANSFER STATION	$	18,450.00		
10/08/2020	**2590.15-01**	**Australia Post**	**POSTAGE**			**$**	**322.85**
07/08/2020	1009710310		RATES COLLECTION FEES - 2019/2020	$	322.85		
10/08/2020	**2590.1521-01**	**Dial A Nappy & Busiclean**	**GOODS**			**$**	**921.60**
04/08/2020	INV-12153		CLEANING CHEMICALS FOR MECPC	$	921.60		
10/08/2020	**2590.191-01**	**Eastern Region Security**	**SECURITY EXPENSES**			**$**	**187.00**
07/08/2020	00019319		SECURITY SERVICES	$	187.00		
10/08/2020	**2590.192-01**	**LGIS Insurance Broking Services**	**INSURANCE**			**$**	**932.47**
04/08/2020	062-207743		INSURANCE PREMIUM 2020/2021 - MARINE CARGO	$	220.00		
04/08/2020	062-207808		INSURANCE PREMIUM 2020/2021 - MARINE HULL COMMERCIAL	$	712.47		
10/08/2020	**2590.21-01**	**Eastern Metropolitan Regional Council**	**CONSULTING FEES**			**$**	**76,265.20**
04/08/2020	EMRC35307		REGIONAL INTEGRATED TRANSPORT PROJECT FUNDING 2021	$	72,976.20		
28/07/2020	EMRC35174		CDS CONSULTING FEE - 1 JULY 2020 TO 16 OCTOBER 2020	$	3,289.00		
10/08/2020	**2590.215-01**	**Deputy Commissioner of Taxation**	**TAXATION**			**$**	**143,232.00**
02/08/2020	PY02-03-Deputy C		PAYROLL DEDUCTION	$	28,359.00		
02/08/2020	PY01-03-Deputy C		PAYROLL DEDUCTION	$	114,873.00		

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
10/08/2020	**2590.2165-01**	**Country Womens Association of WA In**	**CATERING**		**$ 285.00**
28/07/2020	117		CATERING SERVICES - STONEVILLE FIRE SCHOOL	$ 285.00	
10/08/2020	**2590.2625-01**	**Stewart & Heaton Clothing Co**	**UNIFORMS**		**$ 70.11**
17/07/2020	SIN-3227178		UNIFORMS - PARKERVILLE VBFB	$ 70.11	
10/08/2020	**2590.2741-01**	**Hills Seafood Supplies**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 197.50**
03/08/2020	84617		PROVISIONS FOR REFLECTIONS CAFE	$ 197.50	
10/08/2020	**2590.3088-01**	**Local Government Professionals**	**SUBSCRIPTIONS**		**$ 531.00**
04/08/2020	17511		FELLOW MEMBERSHIP SUBSCRIPTION 2020/2021	$ 531.00	
10/08/2020	**2590.314-01**	**Landgate**	**TITLE SEARCHES**		**$ 157.20**
07/08/2020	1022264		TITLE SEARCHES	$ 157.20	
10/08/2020	**2590.3229-01**	**Mr D A Lavell**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.336-01**	**Fasta Courier Service**	**COURIER SERVICES**		**$ 193.07**
04/08/2020	232706		COURIER SERVICES	$ 193.07	
10/08/2020	**2590.386-01**	**Educational Art Supplies**	**ART SUPPLIES**		**$ 60.01**
23/07/2020	3491337		ART SUPPLIES	$ 60.01	
10/08/2020	**2590.4-01**	**Health Insurance Fund of WA**	**PAYROLL DEDUCTION**		**$ 965.45**
02/08/2020	PY01-03-HIF		PAYROLL DEDUCTION	$ 965.45	
10/08/2020	**2590.4407-01**	**Aardvark Bobcat & Truck Hire**	**HIRE OF PLANT**		**$ 3,340.66**
03/08/2020	#769		HIRE OF PLANT	$ 3,340.66	
10/08/2020	**2590.452-01**	**Mahogany Building & Design**	**MAINTENANCE**		**$ 2,288.00**
04/08/2020	INV0213		MAINTENANCE - MUNDARING LIBRARY	$ 2,288.00	
10/08/2020	**2590.4526-01**	**Mr J S Daw**	**COUNCILLOR ALLOWANCE**		**$ 7,095.92**
01/08/2020	ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 4,479.92	
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 2,324.33	
10/08/2020	**2590.459-01**	**Instant Weighing**	**EQUIPMENT SERVICE**		**$ 770.00**
16/07/2020	INV1849		SERVICE & CALIBRATE COMPULOAD DIGITAL SCALE ON 003MDG	$ 770.00	
10/08/2020	**2590.509-01**	**Work Clobber**	**WORK CLOTHES**		**$ 340.00**
03/08/2020	MD369348		WORK CLOTHES	$ 340.00	
10/08/2020	**2590.5240-01**	**Council On The Ageing WA Inc**	**SUBSCRIPTIONS**		**$ 65.00**
16/07/2020	00006602		MEMBERSHIP ANNUAL FEE JULY 2020 - JUNE 2021	$ 65.00	
10/08/2020	**2590.5719-01**	**Shire of Mundaring - Lotto Club**	**PAYROLL DEDUCTION**		**$ 271.60**
02/08/2020	PY02-03-STAFF LO		PAYROLL DEDUCTION	$ 13.58	
02/08/2020	PY01-03-STAFF LO		PAYROLL DEDUCTION	$ 258.02	
10/08/2020	**2590.573-01**	**ESRI Australia Pty Ltd**	**SOFTWARE EXPENSES**		**$ 72,556.00**
21/07/2020	90076532		ANNUAL SOFTWARE EXPENSES 13/07/2020 TO 12/07/2021	$ 72,556.00	
10/08/2020	**2590.5945-01**	**West Coast Spring Water Pty Ltd**	**CAFE BAR CONSUMABLES**		**$ 35.00**
04/08/2020	1724923		WATER BOTTLES - DEPOT WATER COOLERS	$ 7.00	
30/07/2020	1725422		WATER BOTTLES - KSP LIBRARY	$ 7.00	
04/08/2020	1713993		WATER BOTTLES - DEPOT WATER COOLERS	$ 21.00	
10/08/2020	**2590.6-01**	**Shire of Mundaring - Social Club**	**PAYROLL DEDUCTION**		**$ 4.00**
02/08/2020	PY01-03-MUNDARIN		PAYROLL DEDUCTION	$ 4.00	
10/08/2020	**2590.6185-01**	**Mrs T Burbidge**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.6423-01**	**Australian Training Management**	**STAFF TRAINING**		**$ 740.00**
31/07/2020	00017340		FIRE WARDEN & EXTINGUISHER TRAINING	$ 590.00	
04/08/2020	4725		STAFF FIRST AID TRAINING - MARTIN SHURLOCK	$ 150.00	
10/08/2020	**2590.6732-01**	**Relationships Australia Western**	**EMPLOYEE ASSISTANCE PROGRAM**		**$ 165.00**
31/07/2020	00351306		EMPLOYEE ASSISTANCE PROGRAM	$ 165.00	
10/08/2020	**2590.68-01**	**The Watershed Water Systems**	**RETICULATION PARTS**		**$ 165.92**
20/07/2020	10193582		RETICULATION PARTS	$ 82.96	
20/07/2020	10193583		RETICULATION PARTS	$ 82.96	
10/08/2020	**2590.6876-01**	**RAC Motoring Pty Ltd**	**CALL OUT CHARGES**		**$ 229.00**
09/07/2020	4028903		CALL OUT CHARGES FOR 065MDG	$ 229.00	
10/08/2020	**2590.699-01**	**Curtin University Of Technology**	**STAFF TRAINING**		**$ 88.00**
07/08/2020	PC2020-0084		ANNUAL PRODUCTION FEE - COMMUNITY SERVICE ANNOUNCEMENT	$ 88.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
10/08/2020	**2590.7-01**	**Australian Services Union**	**PAYROLL DEDUCTION**		**$ 155.40**
02/08/2020	PY02-03-AUSTRALI		PAYROLL DEDUCTION	$ 129.50	
02/08/2020	PY01-03-AUSTRALI		PAYROLL DEDUCTION	$ 25.90	
10/08/2020	**2590.7426-01**	**Scoob's Dingo Service**	**FOOTPATH SWEEPING / MAINTENANCE**		**$ 3,029.40**
03/08/2020	2382		FOOTPATH SWEEPING / MAINTENANCE	$ 3,029.40	
10/08/2020	**2590.7590-01**	**PFD Food Services Pty Ltd**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 1,518.35**
07/08/2020	KU931952		PROVISIONS FOR REFLECTIONS CAFE	$ 390.05	
21/07/2020	KU726382		PROVISIONS FOR REFLECTIONS CAFE	$ 652.65	
27/07/2020	KU809469		PROVISIONS FOR REFLECTIONS CAFE	$ 475.65	
10/08/2020	**2590.7716-01**	**Scott Printers Pty Ltd**	**PRINTING**		**$ 5,117.20**
04/08/2020	145229		PRINTING 3000 WEEDS BOOKLETS	$ 5,117.20	
10/08/2020	**2590.7725-01**	**Intelligent IP Communications Pty L**	**NETWORK & DATA SERVICES**		**$ 3,156.38**
07/08/2020	INV00148480		NETWORK & DATA SERVICES	$ 3,156.38	
10/08/2020	**2590.7735-01**	**West Force Plumbing & Gas**	**PLUMBING**		**$ 1,936.00**
16/07/2020	00024613		PLUMBING - DARLINGTON HALL	$ 330.00	
27/07/2020	00024615		PLUMBING - STONEVILLE HALL	$ 1,606.00	
10/08/2020	**2590.793-01**	**The Katharine Susannah Prichard**	**GRANT**		**$ 990.00**
21/07/2020	121027		ANNUAL GRANT - KSP NATIONAL YOUNG WRITER AWARDS	$ 990.00	
10/08/2020	**2590.80-01**	**Bunnings Group Limited**	**HARDWARE**		**$ 766.28**
16/07/2020	2180/01094903		HARDWARE ITEMS	$ 151.92	
17/07/2020	2180/01646771		HARDWARE ITEMS	$ 26.60	
20/07/2020	2180/99844884		HARDWARE ITEMS	$ 212.39	
21/07/2020	2180/01118482		HARDWARE ITEMS	$ 189.06	
24/07/2020	2180/01556392		HARDWARE ITEMS	$ 186.31	
10/08/2020	**2590.8-01**	**LGRCEU**	**PAYROLL DEDUCTION**		**$ 41.00**
02/08/2020	PY02-03-LGRCEU		PAYROLL DEDUCTION	$ 41.00	
10/08/2020	**2590.8051-01**	**Conquest Earthworks**	**EARTHWORKS**		**$ 3,256.00**
28/07/2020	1066		CLEAN & PROFILE HARDSTAND AREA - SHIRE DEPOT	$ 1,661.00	
28/07/2020	1065		FILL DIVERTS & HOLES - MATHIESON RD TRANSFER STATION	$ 1,595.00	
10/08/2020	**2590.8066-01**	**Mr D J Jones**	**COUNCILLOR ALLOWANCE**		**$ 2,088.09**
01/08/2020	ICT ALLOWANCE		ENTITLEMENT FOR AUGUST 2020	$ 291.67	
01/08/2020	MEETING FEE		ENTITLEMENT FOR AUGUST 2020	$ 1,796.42	
10/08/2020	**2590.8545-01**	**Sankey Plumbing Service**	**PLUMBING**		**$ 968.00**
07/08/2020	4796		PLUMBING - CHIDLOW FIRE STATION	$ 495.00	
07/08/2020	4795		PLUMBING - BRUCE DOUGLAS PAVILION	$ 473.00	
10/08/2020	**2590.8944-01**	**Tyres For Trucks**	**TYRES**		**$ 400.00**
30/07/2020	00018163		SUPPLY, TRAVEL & FIT 1 X NEW TYRE ON 048MDG	$ 400.00	
10/08/2020	**2590.91-01**	**Mundaring Glass & Security**	**GLAZING**		**$ 887.00**
03/08/2020	00117568		REPLACE BROKEN WINDOW & WINDOW TINTING - AFM LIBRARY	$ 887.00	
10/08/2020	**2590.9342-01**	**Insight Ornithology**	**CONSTRUCTION WORKS**		**$ 290.00**
31/07/2020	#280720		CONSTRUCT & INSTALL 2 NEST BOXES - BEDFORD ST ROAD UPGRAGE	$ 290.00	
10/08/2020	**2590.9769-01**	**Japanese Truck & Bus Spares**	**PARTS**		**$ 118.80**
23/07/2020	374714		SUPPLY 20 LITRE RED COOLANT FOR HINO 035MDG	$ 118.80	
10/08/2020	**2590.9827-01**	**Mr L Fawell**	**PROMOTIONAL VIDEOGRAPHY**		**$ 250.00**
03/08/2020	20247		PROMOTIONAL VIDEOGRAPHY - BOYA LIBRARY TALK FILMING	$ 250.00	
10/08/2020	**2591.10475-01**	**Solargain PV Pty Ltd**	**REFUND**		**$ 51.43**
10/08/2020	REFUND		REFUND - BUILDING PERMIT# 011081 6945 GREAT EASTERN HWY	$ 51.43	
10/08/2020	**2591.13459-01**	**Mr N P Davis**	**CROSSOVER CONTRIBUTION**		**$ 575.00**
04/08/2020	X OVER		CROSSOVER CONTRIBUTION - MARLOO RD GREENMOUNT	$ 575.00	
10/08/2020	**2591.13460-01**	**Mr R M Webster**	**REFUND**		**$ 103.00**
10/08/2020	REFUND		REFUND - DOUBLE PAYMENT BUILDING PLANS 23 WELBOURN	$ 103.00	
10/08/2020	**2591.13473-01**	**Mr T K Manson**	**CROSSOVER CONTRIBUTION**		**$ 1,150.00**
10/08/2020	X OVER		CROSSOVER CONTRIBUTION - BERESFORD GDNS SWAN VIEW	$ 1,150.00	
10/08/2020	**2591.13474-01**	**Mr D J Taylor**	**REFUND**		**$ 100.00**
10/08/2020	REFUND		REFUND - PLANNING APPLICATION EVANS ST MT HELENA	$ 100.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
10/08/2020	**2591.174-01**	**Synergy**	**ELECTRICITY**		**$ 7,713.83**
27/07/2020	7890341121		ELECTRICITY	$ 221.54	
27/07/2020	4294733928		ELECTRICITY	$ 124.73	
27/07/2020	6860497421		ELECTRICITY	$ 64.05	
27/07/2020	1021165328		ELECTRICITY	$ 218.60	
27/07/2020	5192608710		ELECTRICITY	$ 209.98	
27/07/2020	2548038725		ELECTRICITY	$ 131.08	
27/07/2020	4504944122		ELECTRICITY	$ 115.97	
27/07/2020	1635825121		ELECTRICITY	$ 141.56	
27/07/2020	9159298220		ELECTRICITY	$ 918.60	
28/07/2020	3625641925		ELECTRICITY	$ 366.93	
03/08/2020	8852675527		ELECTRICITY	$ 630.40	
03/08/2020	5085138314		ELECTRICITY	$ 111.80	
03/08/2020	5085045110		ELECTRICITY	$ 1,311.19	
03/08/2020	2475997123		ELECTRICITY	$ 216.43	
04/08/2020	3866408227		ELECTRICITY	$ 509.15	
04/08/2020	5185501927		ELECTRICITY	$ 1,082.31	
10/08/2020	5603941927		ELECTRICITY	$ 1,339.51	
10/08/2020	**2591.4693-01**	**Darlington Family Playgroup Inc**	**GRANT**		**$ 500.00**
10/08/2020	GRANT		COVID-19 RELIEF & RECOVERY - RESTART GRANT	$ 500.00	
10/08/2020	**2591.5788-01**	**Mr J P Throssell**	**REIMBURSEMENT**		**$ 84.36**
04/08/2020	REIMBURSEMENT		REIMBURSEMENT - FUEL FOR CEO VEHICLE 1GPJ900	$ 84.36	
10/08/2020	**2591.589-01**	**Shire of Mundaring**	**FDC PARENT LEVY**		**$ 13,247.65**
10/08/2020	060820		FDC PARENT LEVY	$ 13,247.65	
11/08/2020	**2592.13446-01**	**Mr G Muller**	**REFUND**		**$ 240.00**
11/08/2020	REFUND OVERPAYME		RATES REFUND	$ 240.00	
11/08/2020	**2592.4063-01**	**Mr R J Gibson**	**REFUND**		**$ 120.00**
11/08/2020	REFUND OVERPAYME		RATES REFUND	$ 80.00	
11/08/2020	overpayment		RATES REFUND	$ 40.00	
13/08/2020	**2593.34-01**	**Water Corporation**	**WATER RATES & FEES**		**$ 833.60**
13/08/2020	9004565691		WATER RATES & FEES	$ 65.47	
13/08/2020	9004607388		WATER RATES & FEES	$ 22.66	
13/08/2020	9020409381		WATER RATES & FEES	$ 37.77	
13/08/2020	9020758629		WATER RATES & FEES	$ 67.99	
13/08/2020	9019819770		TRADE WASTE PERMIT 40686 207 CLAYTON ST KOONGAMIA	$ 348.09	
13/08/2020	9004600055		WATER RATES & FEES	$ 291.62	
14/08/2020	**2594.3462-01**	**Care Giver Subsidies**	**CARE GIVER SUBSIDIES**		**$ 35,714.28**
14/08/2020	140820		CARE GIVER SUBSIDIES	$ 35,714.28	
17/08/2020	**2595.11587-01**	**Mrs N D Zlatnik**	**REFUND**		**$ 240.00**
14/08/2020	REFUND		REFUND - OVERPAYMENT NETBALL CLUB BOOKING MUNDARING ARENA	$ 240.00	
17/08/2020	**2595.119-01**	**Telstra**	**TELEPHONE**		**$ 7,764.96**
14/08/2020	2085566000		TELEPHONE CHARGES JULY 2020	$ 7,764.96	
17/08/2020	**2595.12665-01**	**Building and Construction Industry**	**BCITF LEVY**		**$ 9,385.59**
14/08/2020	INV-55627-Z0L5N0		BCITF LEVY - JULY 2020	$ 9,385.59	
17/08/2020	**2595.13468-01**	**Mr B A Dalgleish**	**CROSSOVER CONTRIBUTION**		**$ 575.00**
14/08/2020	X OVER		CROSSOVER CONTRIBUTION - NOEL ST HELENA VALLEY	$ 575.00	
17/08/2020	**2595.13481-01**	**Mr L P Abreu**	**REFUND**		**$ 103.00**
14/08/2020	REFUND		REFUND - BUILDING PLANS REQUEST FEE PLANS NOT AVAILABLE	$ 103.00	
17/08/2020	**2595.13483-01**	**Ms K Callaway**	**REFUND**		**$ 62.40**
14/08/2020	REFUND		REFUND - COUNCIL 25% BOOKING REFUND	$ 62.40	
17/08/2020	**2595.13485-01**	**Ms T Mason**	**REFUND**		**$ 9.99**
14/08/2020	REFUND		REFUND - OVERPAYED CHILD CARE FEE NO LONGER USING	$ 9.99	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
17/08/2020	**2595.174-01**	**Synergy**	**ELECTRICITY**		**$ 7,003.24**
31/07/2020	5213386810		ELECTRICITY	$ 1,258.10	
31/07/2020	6945660323		ELECTRICITY	$ 1,100.40	
31/07/2020	5831532322		ELECTRICITY	$ 585.83	
31/07/2020	5416370728		ELECTRICITY	$ 300.98	
31/07/2020	1187187526		ELECTRICITY	$ 135.20	
03/08/2020	7556391528		ELECTRICITY	$ 250.68	
04/08/2020	1059211527		ELECTRICITY	$ 280.65	
04/08/2020	3084190724		ELECTRICITY	$ 177.38	
10/08/2020	7436114725		ELECTRICITY	$ 222.42	
10/08/2020	0998549922		ELECTRICITY	$ 632.87	
10/08/2020	4743483524		ELECTRICITY	$ 96.59	
13/08/2020	1808368323		ELECTRICITY	$ 1,688.02	
14/08/2020	5026791717		ELECTRICITY	$ 274.12	
17/08/2020	**2595.589-01**	**Shire of Mundaring**	**FDC PARENT LEVY**		**$ 13,687.10**
14/08/2020	JULY 2020		BCITF LEVY - JULY 2020	$ 99.00	
14/08/2020	140820		FDC PARENT LEVY	$ 13,588.10	
17/08/2020	**2595.7022-01**	**Glen Forrest Junior Cricket Club**	**GRANT**		**$ 2,400.00**
11/08/2020	GRANT		COVID-19 RELIEF & RECOVERY - RESTART GRANT	$ 2,400.00	
17/08/2020	**2596.10361-01**	**Zenien**	**ELECTRICAL**		**$ 432.52**
03/08/2020	I7793		REPLACE FAILED NETWORK SWITCH - LAKE LESCHENAULTIA	$ 432.52	
17/08/2020	**2596.10881-01**	**Alsco Pty Ltd**	**FIRST AID REPLENISHMENT**		**$ 932.97**
31/07/2020	CPER2055298		FIRST AID REPLENISHMENT	$ 31.35	
31/07/2020	CPER2055277		FIRST AID REPLENISHMENT	$ 107.61	
31/07/2020	CPER2055231		FIRST AID REPLENISHMENT	$ 380.38	
31/07/2020	CPER2055199		FIRST AID REPLENISHMENT	$ 29.73	
11/08/2020	CPER2050719		FIRST AID REPLENISHMENT	$ 383.90	
17/08/2020	**2596.10904-01**	**Split Horizon Pty Ltd**	**IT HARDWARE**		**$ 10,140.45**
14/08/2020	INV001006		CISCO INTERGRATED ROUTER, MAINTENANCE & SUPPORT	$ 10,140.45	
17/08/2020	**2596.11017-01**	**Sapio Pty Ltd**	**ALARM MONITORING**		**$ 225.50**
17/08/2020	SP153351		REPLACE BACK UP BATTERY - SWAN VIEW PLAYGROUP	$ 143.00	
17/08/2020	SP153366		CALL OUT TO INVESTIGATE ARMING ISSUE - SWAN VIEW PLAYGROUP	$ 82.50	
17/08/2020	**2596.11135-01**	**Frontline Fire & Rescue Equipment**	**EQUIPMENT PURCHASES**		**$ 641.86**
23/07/2020	68365		EQUIPMENT PURCHASES - PARKERVILLE VBFB	$ 208.73	
23/07/2020	68366		EQUIPMENT PURCHASES - STONEVILLE VBFB	$ 433.13	
17/08/2020	**2596.11452-01**	**S and I Services (Sneska Ilikj T/A)**	**CLEANING**		**$ 320.00**
13/08/2020	183		CLEANING SERVICES	$ 320.00	
17/08/2020	**2596.11474-01**	**Swan Valley Fresh (Vendor Management**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 108.29**
10/08/2020	00029224		PROVISIONS FOR REFLECTIONS CAFE	$ 108.29	
17/08/2020	**2596.11648-01**	**Veris Australia Pty Ltd**	**SURVEY SERVICES**		**$ 1,776.50**
27/07/2020	VI036610		VOLUME SURVEY - MATHIESON RD TRANSFER STATION	$ 1,776.50	
17/08/2020	**2596.11900-01**	**Mug Shots**	**WALL PLATE EXTRUSION & INSERT**		**$ 66.00**
13/08/2020	00000917		WALL PLATE EXTRUSION & INSERT	$ 66.00	
17/08/2020	**2596.12078-01**	**Recruitwest Pty Ltd**	**TEMP STAFF**		**$ 6,458.39**
13/08/2020	C INV 572738		TEMP STAFF - DEPOT	$ 6,458.39	
17/08/2020	**2596.12136-01**	**Mr D P Hayes**	**DESIGN WORKS**		**$ 100.00**
11/08/2020	1075		DESIGN FULL PAGE COMMUNITY UPDATE FOR ECHO NEWSPAPER	$ 100.00	
17/08/2020	**2596.12149-01**	**TenderLink.com**	**ADVERTISING**		**$ 58.30**
14/08/2020	MUNDAR-329242		ADVERTISING	$ 58.30	
17/08/2020	**2596.12185-01**	**Biobean Coffee Pty Ltd**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 234.00**
24/07/2020	00001095		PROVISIONS FOR REFLECTIONS CAFE	$ 234.00	
17/08/2020	**2596.12281-01**	**Coast 2 Coast Mounts**	**PARTS**		**$ 246.50**
11/08/2020	205880		UPGRADE OF BRACKETS FOR TABLETS - FHIO VEHICLES	$ 246.50	
17/08/2020	**2596.12336-01**	**MBC Trees and Bobcat**	**MITIGATION WORKS**		**$ 5,775.00**
11/08/2020	793-2020		MITIGATION WORKS - CARRAWATHA RD PARKERVILLE	$ 5,775.00	
17/08/2020	**2596.12451-01**	**Rainchaser Pumps and Reticulation**	**PARTS**		**$ 30.53**
14/08/2020	INV-1229		PARTS FOR DEPOT WORKSHOP	$ 30.53	
17/08/2020	**2596.12454-01**	**Hills Windscreens**	**WINDSCREENS**		**$ 594.00**
04/08/2020	04147		SUPPLY & FIT WINDSCREEN TO 1GVY161 & 053MDG	$ 594.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
17/08/2020	**2596.12579-01**	**Mr V Crowe**	**LANDSCAPE & CLEANING SERVICES**		**$ 840.00**
10/08/2020	1524		LANDSCAPE SERVICES	$ 210.00	
10/08/2020	1521		LANDSCAPE SERVICES	$ 210.00	
10/08/2020	1522		CLEANING SERVICES	$ 210.00	
10/08/2020	1523		LANDSCAPE SERVICES	$ 210.00	
17/08/2020	**2596.12640-01**	**Officeworks Ltd**	**STATIONERY ITEMS**		**$ 107.75**
28/07/2020	10995459		STATIONERY ITEMS	$ 107.75	
17/08/2020	**2596.12866-01**	**From Scratch Small Event Catering**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 107.00**
17/08/2020	983		PROVISIONS FOR REFLECTIONS CAFE	$ 107.00	
17/08/2020	**2596.12899-01**	**NAPA (A Division of GPC Asia Pacific**	**WORKSHOP CONSUMABLES**		**$ 261.16**
23/07/2020	1320083351		SUPPLY OIL FILTERS FOR 803MDG & 801MDG	$ 69.30	
23/07/2020	1320083423		SUPPLY OF WORKSHOP CONSUMABLES	$ 27.72	
30/07/2020	1320084368		SUPPLY OF WORKSHOP CONSUMABLES	$ 43.40	
30/07/2020	1320083658		SUPPLY OF WORKSHOP CONSUMABLES	$ 30.80	
14/08/2020	1320084200		SUPPLY OIL FILTERS FOR P734, P733, P2482 & P2490	$ 89.94	
17/08/2020	**2596.12944-01**	**Avon Tree Management (Kajanni Pty L**	**TREE MANAGEMENT**		**$ 31,433.60**
11/08/2020	239		MITIGATION WORKS - R31697 YILGARN PARK MUNDARING	$ 2,310.00	
11/08/2020	238		MITIGATION WORKS - R45887 HIGGISON RD STONEVILLE	$ 3,465.00	
11/08/2020	217		SITE WORKS & VEGETATION REMOVAL - NEW MENS SHED	$ 3,109.70	
11/08/2020	232		TREE MANAGEMENT SERVICES - ANKETELL RD MT HELENA	$ 3,234.00	
11/08/2020	233		TREE MANAGEMENT SERVICES - ANKETELL RD MT HELENA	$ 3,234.00	
13/08/2020	240		TREE MAINTENANCE & FORESTRY MULCHING - CHIDLOW PLAYGROUP	$ 4,646.40	
13/08/2020	234		TREE MANAGEMENT SERVICES - ANKETELL RD MT HELENA	$ 3,234.00	
13/08/2020	235		TREE MANAGEMENT SERVICES - ALICE RD MOUNT HELENA	$ 3,234.00	
13/08/2020	236		TREE MANAGEMENT SERVICES - ALICE RD MOUNT HELENA	$ 3,234.00	
13/08/2020	237		PICK UP LOGS WITH HIAB TRUCK FROM VARIOUS LOCATIONS	$ 1,732.50	
17/08/2020	**2596.13040-01**	**Crowy's Concrete Pty Ltd**	**EARTHWORKS**		**$ 3,917.32**
11/08/2020	INV-254		REMOVE & REINSTATE DAMAGED CROSSOVERS - GREAT EASTERN HIGHWAY	$ 3,917.32	
17/08/2020	**2596.13059-01**	**Mundaring Tyrepower (AnK Murphy Pty**	**TYRES**		**$ 835.00**
24/07/2020	103004		SUPPLY & FIT 4 X NEW TYRES FOR 05MDG	$ 676.00	
30/07/2020	102959		REPAIR TYRE ON 864MDG	$ 60.00	
30/07/2020	102999		REPAIR TYRE ON 075MDG	$ 99.00	
17/08/2020	**2596.13163-01**	**Toll Transport Pty Ltd**	**COURIER SERVICES**		**$ 13.05**
21/07/2020	0438-S364420		COURIER SERVICES	$ 13.05	
17/08/2020	**2596.13249-01**	**Pool & Pump Service & Repairs Pty L**	**EQUIPMENT SERVICING**		**$ 297.00**
10/08/2020	100075		RESET & CALIBRATE CHEMICAL CONTROLLER - MT HELENA AQUATIC CENTRE	$ 297.00	
17/08/2020	**2596.13289-01**	**Two Feet and A Heartbeat**	**PERTH CITY SCAVENGER HUNT YOUTH ADVISORY**		**$ 200.00**
10/08/2020	00014378		PERTH CITY SCAVENGER HUNT YOUTH ADVISORY - DEPOSIT	$ 200.00	
17/08/2020	**2596.13308-01**	**Optica Life Accessories Limited**	**CONSUMABLES**		**$ 383.89**
30/07/2020	310288		ANTI-BACTERIAL WIPES - BOYA & MUNDARING LIBRARY	$ 383.89	
17/08/2020	**2596.13395-01**	**Plumbdog Midland (Lawson & Son Plum**	**PLUMBING**		**$ 300.00**
13/08/2020	873		PLUMBING - REPAIR GAS HEATER IN TODDLERS ROOM - MECPC	$ 300.00	
17/08/2020	**2596.13437-01**	**Elevation Digital**	**SOCIAL MEDIA MANAGEMENT SERVICES**		**$ 600.00**
07/08/2020	200		SOCIAL MEDIA MANAGEMENT SERVICES - JULY 2020	$ 600.00	
17/08/2020	**2596.13453-01**	**Expandabrand (The Trustee for BF Tr**	**SIGNAGE**		**$ 753.50**
11/08/2020	64922		2 X RAILWAY RESERVES HERITAGE TRAIL WING BANNERS	$ 753.50	
17/08/2020	**2596.135-01**	**BOC Ltd**	**CYLINDER RENTAL**		**$ 129.49**
14/08/2020	4026111038		CYLINDER RENTAL	$ 129.49	
17/08/2020	**2596.146-01**	**Eastern Hills Saws & Mowers Pty Ltd**	**PARTS**		**$ 59.00**
14/08/2020	45361 # 11		SUPPLY CLUTCH DRUM FOR P1005	$ 59.00	
17/08/2020	**2596.15-01**	**Australia Post**	**POSTAGE**		**$ 2,882.89**
10/08/2020	1009791576		RATES COLLECTION FEES - 2020/2021	$ 703.69	
10/08/2020	1009800879		DAILY OUTGOING MAIL	$ 2,012.29	
04/08/2020	1009800433		POSTAGE CHARGES - LIBRARY	$ 166.91	
17/08/2020	**2596.191-01**	**Eastern Region Security**	**SECURITY EXPENSES**		**$ 709.50**
11/08/2020	00019253		SECURITY EXPENSES	$ 82.50	
11/08/2020	00019316		SECURITY EXPENSES	$ 88.00	
11/08/2020	00019320		SECURITY EXPENSES	$ 88.00	
11/08/2020	00019315		SECURITY EXPENSES	$ 451.00	
17/08/2020	**2596.2165-01**	**Country Womens Association of WA In**	**CATERING**		**$ 330.00**
04/08/2020	118		CATERING SERVICES - DARLINGTON LEADERSHIP COURSE	$ 330.00	
17/08/2020	**2596.2259-01**	**Forpark Australia**	**PLAY EQUIPMENT**		**$ 1,188.00**
11/08/2020	46189		SUPPLY 1 X POMMEL CLIMBER - MUNDARING OVAL PLAYGROUND	$ 1,188.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
17/08/2020	**2596.234-01**	**Coles Supermarkets Australia Pty Lt**	**KIOSK SUPPLIES**		**$ 1,064.89**
13/08/2020	106141661		FOOD & CONSUMABLES FOR CHILDREN & STAFF - MECPC	$ 267.29	
13/08/2020	106329685		FOOD & CONSUMABLES FOR CHILDREN & STAFF - MECPC	$ 401.65	
13/08/2020	106719767		FOOD & CONSUMABLES FOR CHILDREN & STAFF - MECPC	$ 395.95	
17/08/2020	**2596.2689-01**	**Grasstrees Australia**	**PLANTS**		**$ 1,375.00**
23/07/2020	00009336		PLANTS	$ 1,375.00	
17/08/2020	**2596.280-01**	**Winc Australia Pty Limited**	**STATIONERY**		**$ 137.97**
28/07/2020	9033257854		STATIONERY ITEMS	$ 137.97	
17/08/2020	**2596.3232-01**	**Turfworks WA Pty Ltd**	**MOWING**		**$ 5,757.32**
13/08/2020	4862		MOWING SERVICES	$ 1,688.92	
13/08/2020	4863		MOWING SERVICES	$ 2,394.60	
13/08/2020	4864		MOWING SERVICES	$ 1,673.80	
17/08/2020	**2596.3445-01**	**Quick Corporate Australia**	**STATIONERY**		**$ 70.40**
28/07/2020	SIN-01227020		STATIONERY ITEMS	$ 70.40	
17/08/2020	**2596.381-01**	**Mundaring Electrical Contracting Se**	**ELECTRICAL SERVICES**		**$ 477.40**
11/08/2020	7120		ELECTRICAL SERVICES - ADMIN BUILDING	$ 147.40	
11/08/2020	7121		ELECTRICAL SERVICES - ADMIN BUILDING	$ 99.00	
11/08/2020	7119		ELECTRICAL SERVICES - MUNDARING ARENA	$ 132.00	
11/08/2020	7123		ELECTRICAL SERVICES - MUNDARING LIBRARY	$ 99.00	
17/08/2020	**2596.393-01**	**Western Australian Local Government**	**SUBSCRIPTIONS**		**$ 48,248.40**
21/07/2020	I3082965		WALGA SUBSCRIPTIONS 01/07/2020 TO 30/06/2021	$ 48,248.40	
17/08/2020	**2596.394-01**	**Martins Trailer Parts**	**PARTS**		**$ 135.15**
21/07/2020	1108558		PARTS	$ 135.15	
17/08/2020	**2596.4407-01**	**Aardvark Bobcat & Truck Hire**	**HIRE OF PLANT**		**$ 4,175.82**
13/08/2020	#771		HIRE OF PLANT	$ 4,175.82	
17/08/2020	**2596.4453-01**	**Technifire 2000**	**VEHICLE REPAIRS**		**$ 14,089.71**
27/07/2020	23937		REPAIRS TO MUNDARING LIGHT TANKER 081MDG	$ 14,089.71	
17/08/2020	**2596.4560-01**	**Flexi Staff Pty Ltd**	**TEMP STAFF**		**$ 962.35**
13/08/2020	I0000866		TEMP STAFF - DEPOT	$ 962.35	
17/08/2020	**2596.4811-01**	**West Sure Group Pty Ltd**	**SECURITY EXPENSES**		**$ 243.00**
10/08/2020	00022449		SECURITY EXPENSES	$ 30.75	
13/08/2020	00022448		SECURITY EXPENSES	$ 212.25	
17/08/2020	**2596.5147-01**	**IPWEA National**	**SUBSCRIPTIONS**		**$ 1,402.50**
11/08/2020	84102-NP0820		NAMS SUBSCRIPTION FEE 01/07/2020 - 30/06/2021	$ 1,402.50	
17/08/2020	**2596.6050-01**	**Fuel Distributors of Western Austra**	**FUEL & OILS**		**$ 27,860.80**
14/08/2020	51100895		FUEL & OILS	$ 25,723.28	
27/07/2020	00284266		QUARTZ 208L, 40 X LITHPLEX 450GM & AZOLLA 208L	$ 2,137.52	
17/08/2020	**2596.6421-01**	**Vermeer Equipment of WA & NT**	**VEHICLE REPAIRS**		**$ 2,052.84**
14/08/2020	113988		REPAIR FEED ROLLER FAULT ON CHIPPER	$ 2,052.84	
17/08/2020	**2596.68-01**	**The Watershed Water Systems**	**RETICULATION PARTS**		**$ 3,775.10**
24/07/2020	10193677		RETICULATION PARTS	$ 3,726.72	
30/07/2020	10193676		RETICULATION PARTS	$ 48.38	
17/08/2020	**2596.7230-01**	**Boss Bobcat & Truck Service**	**EARTHWORKS**		**$ 10,301.50**
07/08/2020	3620		TIDY UP OVAL & VERGE AFTER DRAIN WORKS - SAWYERS VALLEY OVAL	$ 4,581.50	
07/08/2020	3520		EARTHWORKS - MUNDARING ARENA CONCOURSE	$ 4,070.00	
10/08/2020	3720		PREPARE & LEVEL SITE FOR NEW BBQ PICNIC TABLE SETTING - RON EVANS RESERVE	$ 825.00	
10/08/2020	3820		CART & SPREAD MULCH - MUNDARING ARENA/OVAL CARPARK	$ 825.00	
17/08/2020	**2596.7489-01**	**Sparks Refrigeration & Aircondition**	**ELECTRICAL SERVICES**		**$ 1,135.00**
27/07/2020	INV-2006		INSPECT FAULTY AIR-CON - BOYA COMMUNITY CENTRE	$ 440.00	
27/07/2020	INV-1997		WATER TREATMENT CHILLED WATER SYSTEM - ADMIN BUILDING	$ 695.00	
17/08/2020	**2596.7641-01**	**Easifleet**	**NOVATED LEASE**		**$ 12,142.23**
13/08/2020	137040		NOVATED LEASE AUGUST 2020	$ 12,142.23	
17/08/2020	**2596.7727-01**	**Marshall Beattie Pty Ltd**	**MAINTENANCE**		**$ 902.00**
13/08/2020	10122575		MAINTENANCE ON ADMIN BUILDING ENTRY DOOR	$ 902.00	
17/08/2020	**2596.7738-01**	**WA Safety Products (Montyanne Trust**	**FLOORING**		**$ 541.57**
28/07/2020	A2734		SUPPLY FLOOR TACTILE ADHESIVE & YELLOW INDICATORS - BROWN PARK YOUTH CENTRE	$ 541.57	
17/08/2020	**2596.7807-01**	**Water Installations**	**MAINTENANCE**		**$ 329.00**
11/08/2020	00017409		CALL OUT REPLACE VANDALISED LID - MT HELENA PAVILION	$ 329.00	
17/08/2020	**2596.8275-01**	**E Fire & Safety**	**SERVICING**		**$ 143.00**
27/07/2020	525766		SERVICING OF DEPOT VEHICLE FIRE EXTINGUISHERS	$ 143.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
17/08/2020	**2596.8545-01**	**Sankey Plumbing Service**	**PLUMBING**		**$ 2,915.00**
13/08/2020	4799		PLUMBING - ADMIN BUILDING	$ 121.00	
13/08/2020	4801		PLUMBING - MUNDARING LIBRARY, GLEN FORREST HALL & HARRY RISEBOROUGH	$ 2,530.00	
14/08/2020	4802		PLUMBING - MUNDARING ARENA	$ 121.00	
14/08/2020	4800		PLUMBING - MUNDARING SCULPTURE PARK	$ 143.00	
17/08/2020	**2596.8880-01**	**Mundaring Chamber of Commerce**	**STOCK PURCHASES**		**$ 320.00**
13/08/2020	INV-1007		SUPPLY 8 X WEIR IN BUSINESS SHOP LOCAL VOUCHER BOOKS - MUNDARING VISITOR CENTRE	$ 320.00	
17/08/2020	**2596.8944-01**	**Tyres For Trucks**	**TYRES**		**$ 330.00**
03/08/2020	00018183		TRAVEL & REPAIR TYRES ON 001MDG	$ 330.00	
17/08/2020	**2596.9184-01**	**Budget Rent A Car (Busby Investment**	**VEHICLE HIRE**		**$ 349.09**
11/08/2020	428425196		HIRE REPLACEMENT VEHICLE - COMMUNITY SAFETY/RANGER 4	$ 349.09	
20/08/2020	**2597.34-01**	**Water Corporation**	**WATER RATES & FEES**		**$ 1,606.47**
18/08/2020	9004610501		WATER RATES & FEES	$ 17.63	
18/08/2020	9019690081		WATER RATES & FEES	$ 427.07	
18/08/2020	9004277008		WATER RATES & FEES	$ 1,139.85	
18/08/2020	9004679584		WATER RATES & FEES	$ 21.92	
20/08/2020	**2598.3462-01**	**Care Giver Subsidies**	**CARE GIVER SUBSIDIES**		**$ 35,696.46**
20/08/2020	200820		CARE GIVER SUBSIDIES	$ 35,696.46	
21/08/2020	**2599.13491-01**	**Mrs VA Wyatt**	**REFUND**		**$ 55.00**
21/08/2020	615323		KEY BOND REFUND	$ 55.00	
21/08/2020	**2599.13492-01**	**Mrs E A Pollock**	**REFUND**		**$ 110.00**
21/08/2020	1202238		HALL BOND REFUND	$ 110.00	
21/08/2020	**2599.13493-01**	**Mr S Carson**	**REFUND**		**$ 330.00**
21/08/2020	1148956		HALL BOND REFUND	$ 330.00	
21/08/2020	**2599.3398-01**	**Darlington Social Cricket Club Inc.**	**REFUND**		**$ 330.00**
21/08/2020	1231851		HALL BOND REFUND	$ 330.00	
21/08/2020	**2599.9422-01**	**Darlington Junior Cricket Club**	**REFUND**		**$ 671.00**
21/08/2020	1175868		KEY BOND REFUND	$ 44.00	
21/08/2020	1175868		KEY BOND REFUND	$ 44.00	
21/08/2020	1175868		KEY BOND REFUND	$ 44.00	
21/08/2020	1175868		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 55.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
21/08/2020	1171406		KEY BOND REFUND	$ 44.00	
24/08/2020	**2600.101-01**	**Midland Mowers**	**EQUIPMENT**		**$ 952.30**
13/08/2020	33162 # 2		SUPPLY BATTERY OPERATED CHAINSAW - CESM VEHICLE	$ 952.30	
24/08/2020	**2600.1020-01**	**Rudd Industrial & Farm Supplies**	**SAFETY EQUIPMENT**		**$ 89.03**
14/08/2020	965627		SAFETY EQUIPMENT	$ 21.38	
03/08/2020	961950		SAFETY EQUIPMENT	$ 61.98	
03/08/2020	961258		SAFETY EQUIPMENT	$ 5.67	
24/08/2020	**2600.10803-01**	**Mammoth Equipment & Exhausts**	**EQUIPMENT**		**$ 319.00**
14/07/2020	117177		SUPPLY 2 X 210L ECOBLUE	$ 319.00	
24/08/2020	**2600.10807-01**	**Total Green Recycling Pty Ltd**	**EWASTE COLLECTION**		**$ 1,592.52**
18/08/2020	INV8004		COPPIN RD TRANSFER STATION - EWASTE ITEMS	$ 1,592.52	
24/08/2020	**2600.10819-01**	**M2 Commander Pty Ltd**	**ADSL CHARGES**		**$ 423.65**
13/08/2020	18965212		ADSL CHARGES	$ 423.65	
24/08/2020	**2600.10881-01**	**Alsco Pty Ltd**	**FIRST AID REPLENISHMENT**		**$ 253.97**
11/08/2020	CPER2058847		FIRST AID REPLENISHMENT	$ 30.33	
11/08/2020	CPER2058848		FIRST AID REPLENISHMENT	$ 116.03	
11/08/2020	CPER2058849		FIRST AID REPLENISHMENT	$ 107.61	
24/08/2020	**2600.11085-01**	**CTI Couriers Pty Ltd**	**COURIER SERVICES**		**$ 415.80**
10/08/2020	CISC4346673		COURIER SERVICES	$ 415.80	
24/08/2020	**2600.11135-01**	**Frontline Fire & Rescue Equipment**	**EQUIPMENT PURCHASES**		**$ 1,772.21**
28/07/2020	68391		EQUIPMENT PURCHASES - BRIGADE DISTRIBUTION	$ 1,728.21	
31/07/2020	68427		EQUIPMENT PURCHASES - CHIDLOW VBFB	$ 44.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
24/08/2020	**2600.11321-01**	**Julieman Pty Ltd T/A Complete Build**	**PARTS**		**$ 792.00**
16/07/2020	C3105		SUPPLY 20 X TOILET INDICATOR SETS	$ 792.00	
24/08/2020	**2600.11326-01**	**Learning Seat Pty Ltd**	**SUBSCRIPTIONS**		**$ 1,825.99**
04/08/2020	6477006216		SUBSCRIPTION FEE FOR 29/07/2020 TO 28/08/2020	$ 1,825.99	
24/08/2020	**2600.11453-01**	**Midland Toyota (Midland 2015 Pty Lt**	**VEHICLE REPAIRS**		**$ 112.99**
20/08/2020	50340925		REPAIR HIGH BEAM FAULT ON 088MDG	$ 112.99	
24/08/2020	**2600.11474-01**	**Swan Valley Fresh (Vendor Management**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 31.02**
17/08/2020	00029304		PROVISIONS FOR REFLECTIONS CAFE	$ 31.02	
24/08/2020	**2600.11478-01**	**Emerg Solutions Pty Ltd**	**SUBSCRIPTIONS**		**$ 7,275.00**
17/08/2020	49226		BART SUBSCRIPTION 2020/2021 485 LICENSES	$ 7,275.00	
24/08/2020	**2600.11578-01**	**Corsign WA Pty Ltd**	**SIGNAGE**		**$ 374.00**
10/08/2020	00048797		SUPPLY & DELIVER STREET SIGNS	$ 74.80	
21/07/2020	00048510		SUPPLY & DELIVER STREET SIGNS	$ 299.20	
24/08/2020	**2600.11648-01**	**Veris Australia Pty Ltd**	**SURVEY SERVICES**		**$ 1,628.00**
11/08/2020	VI037452		FEATURE SURVEY - ORCHARD AVENUE WOOROLOO	$ 1,628.00	
24/08/2020	**2600.11921-01**	**Mundaring Smash Repairs (WA Panel W**	**TOWING SERVICES**		**$ 176.00**
07/08/2020	66908		TOWING SERVICES	$ 176.00	
24/08/2020	**2600.11953-01**	**The Stationery Co (C Willis & D J**	**STATIONERY**		**$ 79.63**
10/08/2020	160865		STATIONERY ITEMS	$ 26.90	
10/08/2020	160866		STATIONERY ITEMS	$ 47.65	
10/08/2020	160867		STATIONERY ITEMS	$ 5.08	
24/08/2020	**2600.12-01**	**Department of Human Services - Child**	**CHILD SUPPORT PAYMENT**		**$ 238.48**
16/08/2020	PY02-04-CHILD SU		CHILD SUPPORT PAYMENT	$ 238.48	
24/08/2020	**2600.12078-01**	**Recruitwest Pty Ltd**	**TEMP STAFF**		**$ 5,373.21**
18/08/2020	C INV 572777		TEMP STAFF - DEPOT	$ 5,373.21	
24/08/2020	**2600.12080-01**	**Midland Tools Pty Ltd T/A Total Too**	**PARTS**		**$ 29.95**
09/07/2020	194500		SUPPLY PROCHOICE RESPIRATOR FILTERS	$ 29.95	
24/08/2020	**2600.12149-01**	**TenderLink.com**	**ADVERTISING**		**$ 58.30**
09/07/2020	MUNDAR-342985		ADVERTISING	$ 58.30	
24/08/2020	**2600.12185-01**	**Biobean Coffee Pty Ltd**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 38.94**
30/07/2020	00001157		PROVISIONS FOR REFLECTIONS CAFE	$ 38.94	
24/08/2020	**2600.12353-01**	**WCP Civil Pty Ltd**	**ROAD IMPROVEMENTS**		**$ 48,547.42**
18/08/2020	23329		ROAD IMPROVEMENTS - WOOLOOMOOLOO RD GREENMOUNT	$ 48,547.42	
24/08/2020	**2600.12388-01**	**Mint Civil T/A Kalamunda Sweeping**	**STREET SWEEPING SERVICES**		**$ 7,098.00**
28/07/2020	M 2563		SUPPLY OF STREET SWEEPING SERVICES	$ 3,549.00	
28/07/2020	M 2561		SUPPLY OF STREET SWEEPING SERVICES	$ 3,549.00	
24/08/2020	**2600.12402-01**	**Grace Information & Records Managem**	**OFFSITE RECORDS STORAGE**		**$ 1,823.48**
04/08/2020	RP01027864		OFFSITE RECORDS STORAGE	$ 1,823.48	
24/08/2020	**2600.12427-01**	**All Suburbs Garden & Wood Supplies**	**FIRE WOOD**		**$ 1,056.00**
20/08/2020	26249		SUPPLY FIRE WOOD FOR LAKE LESCHENAULTIA	$ 1,056.00	
24/08/2020	**2600.12470-01**	**Mr G Wood**	**FENCING**		**$ 1,507.00**
11/08/2020	IV00000000064		INSTALL CONCRETE PAD & WATER FOUNTAIN - DARLINGTON OVAL	$ 572.00	
11/08/2020	IV00000000065		SUPPLY MATERIALS TO REPAIR GATE - MT HELENA TENNIS CLUB	$ 308.00	
11/08/2020	IV00000000066		SUPPLY MATERIALS REPAIR HOLE - MUNDARING HARD COURTS FENCING	$ 165.00	
11/08/2020	IV00000000067		INSTALL BOLLARD - MUNDARING OVAL CARPARK	$ 462.00	
24/08/2020	**2600.12579-01**	**Mr V Crowe**	**LANDSCAPE, MAINTENANCE & CLEANING SERVICES**		**$ 910.00**
18/08/2020	1528		LANDSCAPE & MAINTENANCE SERVICES	$ 280.00	
18/08/2020	1526		CLEANING SERVICES	$ 210.00	
18/08/2020	1527		LANDSCAPE SERVICES	$ 210.00	
18/08/2020	1525		LANDSCAPE SERVICES	$ 210.00	
24/08/2020	**2600.12598-01**	**Mr O Briffa**	**BOOKS**		**$ 175.00**
21/08/2020	013		SUPPLY 7 X LOST MUNDARING & SURROUNDS BOOKS	$ 175.00	
24/08/2020	**2600.127-01**	**Volich Waste Contractors Pty Ltd**	**REFUSE CONTRACT**		**$ 128.04**
10/08/2020	00005660		REFUSE CONTRACT	$ 128.04	
24/08/2020	**2600.12784-01**	**Shodan Electrical Pty Ltd**	**ELECTRICAL**		**$ 293.46**
20/08/2020	IV00834		ELECTRICAL - LAKE LESCHENAULTIA CAMP GROUND TOILET LIGHTING	$ 293.46	
24/08/2020	**2600.12899-01**	**NAPA (A Division of GPC Asia Pacific**	**WORKSHOP CONSUMABLES**		**$ 159.50**
14/08/2020	1320085836		SUPPLY OF WORKSHOP CONSUMABLES	$ 33.00	
30/07/2020	1320084847		SUPPLY OF WORKSHOP CONSUMABLES	$ 126.50	
24/08/2020	**2600.12938-01**	**Aussie Broadband Pty Ltd**	**NBN & VOIP SERVICE CHARGES**		**$ 4,285.50**
28/07/2020	8638403		NBN & VOIP SERVICE CHARGES	$ 4,285.50	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
24/08/2020	**2600.13-01**	**Shire of Mundaring**	**PAYROLL DEDUCTION**		**$ 9,436.09**
16/08/2020	PY01-04-Private		PAYROLL DEDUCTION	$ 600.00	
16/08/2020	PY01-04-Child Ca		PAYROLL DEDUCTION	$ 2,081.41	
16/08/2020	PY01-04-Buy Addi		PAYROLL DEDUCTION	$ 768.93	
16/08/2020	PY01-04-Novated		PAYROLL DEDUCTION	$ 3,136.81	
16/08/2020	PY01-04-Novated		PAYROLL DEDUCTION	$ 2,153.62	
16/08/2020	PY02-04-Private		PAYROLL DEDUCTION	$ 150.00	
16/08/2020	PY02-04-Buy Addi		PAYROLL DEDUCTION	$ 545.32	
24/08/2020	**2600.13029-01**	**Community Greenwaste Recycling Pty**	**GREENWASTE PROCESSING SERVICES**		**$ 30,735.06**
09/07/2020	INV-1268		GREENWASTE PROCESSING SERVICES	$ 22,689.75	
28/07/2020	INV-1282		GREENWASTE PROCESSING SERVICES	$ 8,045.31	
24/08/2020	**2600.13059-01**	**Mundaring Tyrepower (AnK Murphy Pty**	**TYRES**		**$ 1,352.00**
30/07/2020	103035		SUPPLY & FIT 4 X NEW TYRES TO 062MDG & 825MDG	$ 1,352.00	
24/08/2020	**2600.13101-01**	**Mr M D Corica**	**REIMBURSEMENT**		**$ 52.62**
24/08/2020	TRAVEL		TRAVEL REIMBURSEMENT FOR 56KM ON 17TH & 18TH AUGUST 2020	$ 52.62	
24/08/2020	**2600.13208-01**	**Fire Protection Services WA Pty Ltd**	**MAINTENANCE**		**$ 478.96**
21/08/2020	00007318		FIRE & EMERGENCY SERVICES MAINTENANCE - BOYA COMMUNITY CENTRE	$ 478.96	
24/08/2020	**2600.13268-01**	**Department of Human Services - The**	**CENTRELINK PAYMENT**		**$ 99.81**
16/08/2020	PY01-04-Centreli		CENTRELINK PAYMENT	$ 99.81	
24/08/2020	**2600.13275-01**	**PLE Computers Pty Ltd**	**IT HARDWARE**		**$ 336.00**
31/07/2020	SI-1765794		SUPPLY 4 X MICROSOFT WEBCAMS - MUNDARING ARENA, VISITOR CENTRE, BILGOMAN & LAKE	$ 336.00	
24/08/2020	**2600.13335-01**	**Midland Hyundai and Kia (Idom Midla**	**VEHICLE SERVICE**		**$ 867.11**
31/07/2020	62020005		PARTS FOR 803MDG	$ 867.11	
24/08/2020	**2600.13430-01**	**Schneider Electric IT Australia Pty**	**ELECTRICAL**		**$ 1,669.25**
07/08/2020	58708947		UPS BATTERY SHELF CABLING RECTIFICATION	$ 1,669.25	
24/08/2020	**2600.13450-01**	**Childscapes Australia Pty Ltd**	**DESIGN WORKS**		**$ 1,200.00**
10/08/2020	INV-0382		DESIGN OUTDOOR LEARNING AREAS - MECPC	$ 1,200.00	
24/08/2020	**2600.13486-01**	**Pestpro (Cleanpro Work Place Service**	**PEST CONTROL**		**$ 540.10**
20/08/2020	3157		TERMITE CONTROL - SWAN VIEW STATION	$ 204.60	
20/08/2020	3274		TERMITE CONTROL - SCOTT STREET BRIDGE	$ 335.50	
24/08/2020	**2600.1495-01**	**Woodwest**	**PROTECTIVE PERSPEX SCREENS**		**$ 1,930.00**
21/08/2020	2008-01		SUPPLY & INSTALL 4 X PROTECTIVE PERSPEX SCREENS - ADMIN BUIDLING	$ 1,930.00	
24/08/2020	**2600.166-01**	**Vodafone**	**FEES**		**$ 1,867.84**
10/08/2020	11273428		PAGERS & MESSAGING - ALL BRIGADES	$ 1,867.84	
24/08/2020	**2600.1884-01**	**Agparts Warehouse Pty Ltd**	**PARTS**		**$ 194.70**
03/08/2020	253331		PARTS	$ 194.70	
24/08/2020	**2600.191-01**	**Eastern Region Security**	**SECURITY EXPENSES**		**$ 1,182.50**
18/08/2020	00019322		SECURITY SERVICES	$ 264.00	
20/08/2020	00019317		SECURITY EXPENSES	$ 176.00	
20/08/2020	00019321		SECURITY EXPENSES	$ 374.00	
20/08/2020	00019318		SECURITY EXPENSES	$ 368.50	
24/08/2020	**2600.197-01**	**Konica Minolta Business Solutions A**	**PHOTOCOPIER PRINTING**		**$ 3,649.09**
07/08/2020	0400001153320720		PHOTOCOPIER PRINTING	$ 3,649.09	
24/08/2020	**2600.2000-01**	**Zurich Australian Insurance Ltd**	**EXCESS ON INSURANCE**		**$ 2,500.00**
20/08/2020	6043345		EXCESS ON INSURANCE - 048MDG & 877MDG CLAIM# 6043345	$ 2,500.00	
24/08/2020	**2600.21-01**	**Eastern Metropolitan Regional Council**	**TRANSFER STATION FEES**		**$ 191,610.40**
13/08/2020	EMRC35328		COPPIN RD WASTE TRANSFER STATION - SITE MANAGEMENT	$ 32,844.70	
13/08/2020	EMRC35329		MATHIESON RD WASTE TRANSFER STATION - SITE MANAGEMENT	$ 25,828.73	
14/08/2020	EMRC35431		TRANSFER STATION FEES	$ 65,165.78	
17/08/2020	EMRC35244		TRANSFER STATION FEES	$ 67,771.19	
24/08/2020	**2600.215-01**	**Deputy Commissioner of Taxation**	**TAXATION**		**$ 145,546.00**
16/08/2020	PY01-04-Deputy C		PAYROLL DEDUCTION	$ 115,246.00	
16/08/2020	PY02-04-Deputy C		PAYROLL DEDUCTION	$ 30,300.00	
24/08/2020	**2600.2163-01**	**Asphaltech Pty Ltd**	**ASPHALT**		**$ 29,573.75**
11/08/2020	12649		ASPHALT WORKS - DAVIS RD & NOEL ST HELENA VALLEY	$ 29,573.75	
24/08/2020	**2600.2165-01**	**Country Womens Association of WA In**	**CATERING**		**$ 420.00**
11/08/2020	119		CATERING SERVICES - STONEVILLE FIRE SCHOOL	$ 420.00	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
24/08/2020	**2600.218-01**	**Security & Key Distributors**	**SECURITY EQUIPMENT**		**$ 3,801.88**
09/07/2020	85541		SUPPLY 1 X BILOCK PADLOCK - DARLINGTON OVAL PAVILION	$ 172.19	
10/07/2020	85587		SUPPLY 1 X BILOCK KEY - BAILUP EQUESTRIAN CENTRE	$ 45.75	
20/07/2020	85615		SUPPLY 3 X BILOCK KEYS - PARKERVILLE PAVILION	$ 84.74	
21/07/2020	85614		SUPPLY 3 X BILOCK KEYS - LAKE LESCHENAULTIA	$ 102.24	
24/07/2020	85563		REPLACE BILOCK CYLINDER - CHIDLOW OVAL PAVILION	$ 282.66	
24/07/2020	85562		RE-KEY CYLINDER - CHIDLOW PLAYGROUP	$ 159.01	
30/07/2020	85704		SUPPLY 8 X BILOCK KEYS - HUB OF THE HILLS	$ 225.98	
30/07/2020	85709		SUPPLY 96 X BILOCK KEYS FOR ASSORTED BUILDINGS	$ 2,729.31	
24/08/2020	**2600.234-01**	**Coles Supermarkets Australia Pty Lt**	**KIOSK SUPPLIES**		**$ 466.62**
13/08/2020	107149664		FOOD & CONSUMABLES FOR CHILDREN & STAFF - MECPC	$ 466.62	
24/08/2020	**2600.2625-01**	**Stewart & Heaton Clothing Co**	**UNIFORMS**		**$ 1,206.26**
30/07/2020	SIN-3233763		UNIFORMS - GLEN FORREST VBFB	$ 435.59	
30/07/2020	SIN-3233759		UNIFORMS - WOOROLOO VBFB	$ 670.16	
30/07/2020	SIN-3233753		UNIFORMS - PARKERVILLE VBFB	$ 100.51	
24/08/2020	**2600.2641-01**	**St John Ambulance Western Australia**	**SAFETY EQUIPMENT**		**$ 807.98**
04/08/2020	MSOAFG001733		SUPPLY LITHIUM G3 AED POWERHEART BATTERY - ADMIN BUILDING	$ 557.99	
04/08/2020	MSOABP002772		REPLACEMENT DEFIBRILLATOR BATTERY - KSP LIBRARY	$ 249.99	
24/08/2020	**2600.2737-01**	**Du Clene Pty Ltd**	**CLEANING**		**$ 91,125.99**
07/08/2020	00010016		CLEANING SERVICES	$ 85,308.86	
10/08/2020	00010020		CLEANING SERVICES	$ 2,705.78	
04/08/2020	00010015		CLEANING SERVICES	$ 2,877.12	
17/08/2020	00010017		CLEANING SERVICES	$ 234.23	
24/08/2020	**2600.2741-01**	**Hills Seafood Supplies**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 349.16**
17/08/2020	85056		PROVISIONS FOR REFLECTIONS CAFE	$ 349.16	
24/08/2020	**2600.300-01**	**Civica Pty Ltd**	**FEES**		**$ 9,900.00**
20/08/2020	C/LA018733		SPYDUS SERVICE AGREEMENT 11/10/2020 TO 10/01/2021	$ 9,900.00	
24/08/2020	**2600.314-01**	**Landgate**	**TITLE SEARCHES**		**$ 736.45**
20/08/2020	357927-10000974		GROSS RENTAL VALUATIONS CHARGEABLE	$ 736.45	
24/08/2020	**2600.336-01**	**Fasta Courier Service**	**COURIER SERVICES**		**$ 318.26**
17/08/2020	233397		COURIER SERVICES	$ 318.26	
24/08/2020	**2600.347-01**	**Crommelins Machinery/Australia**	**PARTS**		**$ 12.21**
20/07/2020	451356		SUPPLY 2 X CHAMBER PACKINGS FOR 028MDG	$ 12.21	
24/08/2020	**2600.381-01**	**Mundaring Electrical Contracting Se**	**ELECTRICAL SERVICES**		**$ 990.00**
17/08/2020	7124		ELECTRICAL SERVICES - ADMIN BUILDING	$ 496.10	
17/08/2020	7122		ELECTRICAL SERVICES - ADMIN BUILDING	$ 224.40	
17/08/2020	7125		ELECTRICAL SERVICES - HUB OF THE HILLS	$ 269.50	
24/08/2020	**2600.3868-01**	**Bucher Municipal Pty Ltd**	**PARTS**		**$ 1,246.08**
21/07/2020	973764		SUPPLY PARTS FOR SWEEPER TRUCK 043MDG	$ 73.26	
03/08/2020	974305		SUPPLY PARTS FOR SWEEPER TRUCK 043MDG	$ 1,172.82	
24/08/2020	**2600.393-01**	**Western Australian Local Government**	**TRAINING**		**$ 2,995.00**
24/08/2020	I3083256		REGISTRATION - UNDERSTANDING LOCAL GOVERNMENT - CR SIMON CUTHBERT	$ 195.00	
24/08/2020	I3083258		REGISTRATION - SERVING ON COUNCIL - CR SIMON CUTHBERT	$ 900.00	
24/08/2020	I3083257		REGISTRATION - CONFLICTS OF INTEREST - CR SIMON CUTHBERT	$ 195.00	
24/08/2020	I3083259		REGISTRATION - MEETING PROCEDURES - CR SIMON CUTHBERT	$ 475.00	
24/08/2020	I3083260		REGISTRATION - UNDERSTANDING FINANCIAL REPORTS - CR SIMON CUTHBERT	$ 450.00	
24/08/2020	I3083255		REGISTRATION - SERVING ON COUNCIL - CR MATTHEW CORICA	$ 195.00	
24/08/2020	I3083254		REGISTRATION - MEETING PROCEDURES - CR MATTHEW CORICA	$ 195.00	
24/08/2020	I3083253		REGISTRATION - CONFLICTS OF INTEREST - CR MATTHEW CORICA	$ 195.00	
24/08/2020	I3083252		REGISTRATION - UNDERSTANDING LOCAL GOVERNMENT - CR MATTHEW CORICA	$ 195.00	
24/08/2020	**2600.4-01**	**Health Insurance Fund of WA**	**PAYROLL DEDUCTION**		**$ 965.45**
16/08/2020	PY01-04-HIF		PAYROLL DEDUCTION	$ 965.45	
24/08/2020	**2600.4252-01**	**Boya Equipment Pty Ltd**	**EQUIPMENT PURCHASES**		**$ 838.68**
03/08/2020	86806/01		SUPPLY & DELIVER PARTS FOR 014MDG	$ 838.68	
24/08/2020	**2600.4407-01**	**Aardvark Bobcat & Truck Hire**	**HIRE OF PLANT**		**$ 3,340.66**
18/08/2020	#772		HIRE OF PLANT	$ 3,340.66	
24/08/2020	**2600.4433-01**	**Marketforce Pty Ltd**	**ADVERTISING**		**$ 3,595.93**
10/08/2020	34219		ADVERTISING	$ 582.78	
10/08/2020	34218		ADVERTISING	$ 499.49	
10/08/2020	34220		ADVERTISING	$ 499.49	
11/08/2020	34217		ADVERTISING	$ 360.67	
04/08/2020	34221		ADVERTISING	$ 1,653.50	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
24/08/2020	**2600.4453-01**	**Technifire 2000**	**VEHICLE REPAIRS**		**$ 852.56**
30/07/2020	23967		REPAIRS TO MT HELENA LIGHT TANKER 079MDG	$ 852.56	
24/08/2020	**2600.452-01**	**Mahogany Building & Design**	**MAINTENANCE**		**$ 2,519.00**
18/08/2020	INV0236		MAINTENANCE - GLEN FORREST OVAL CHANGE ROOMS	$ 682.00	
18/08/2020	INV0237		MAINTENANCE - PARKERVILLE HALL	$ 517.00	
18/08/2020	INV0238		MAINTENANCE - DARLINGTON HALL	$ 616.00	
20/08/2020	INV0235		MAINTENANCE - LAKE LESCHENAULTIA	$ 572.00	
20/08/2020	INV0234		MAINTENANCE - LAKE LESCHENAULTIA	$ 132.00	
24/08/2020	**2600.4560-01**	**Flexi Staff Pty Ltd**	**TEMP STAFF**		**$ 1,443.52**
18/08/2020	I0001026		TEMP STAFF - DEPOT	$ 1,443.52	
24/08/2020	**2600.4658-01**	**Westwater Enterprises Pty Ltd**	**EQUIPMENT REPAIRS**		**$ 3,527.21**
07/08/2020	WS0676/1		SERVICING CHLORINE EQUIPMENT	$ 3,527.21	
24/08/2020	**2600.4749-01**	**Pure Air Filters**	**PARTS**		**$ 401.50**
30/07/2020	00012412		AIR FILTER CLEANERS FOR ASSORTED VEHICLES	$ 257.40	
30/07/2020	00012438		AIR FILTER CLEANERS FOR ASSORTED VEHICLES	$ 144.10	
24/08/2020	**2600.480-01**	**Echo Newspaper**	**ADVERTISING**		**$ 2,572.86**
10/07/2020	00013275		ADVERTISING	$ 1,412.00	
17/07/2020	00013432		ADVERTISING	$ 578.85	
24/07/2020	00013587		ADVERTISING	$ 582.01	
24/08/2020	**2600.4865-01**	**Noise & Vibration Measurement System**	**IT HARDWARE**		**$ 1,287.00**
03/08/2020	1000-2426-2020		SUPPLY 10M MICROPHONE EXTENSION CABLE	$ 1,287.00	
24/08/2020	**2600.541-01**	**Australian Red Cross**	**FIRST AID REPLENISHMENT**		**$ 870.75**
31/07/2020	10171330		TELEPHONE OUTREACH DURING COVID-19	$ 870.75	
24/08/2020	**2600.5558-01**	**Global Workwear Investments Pty Ltd**	**WORK CLOTHES**		**$ 2,278.09**
16/07/2020	MD27833.D1		WORK CLOTHES	$ 171.56	
21/07/2020	MD63348		WORK CLOTHES	$ 246.30	
21/07/2020	MD63164		WORK CLOTHES	$ 175.95	
27/07/2020	MD27695.D1		WORK CLOTHES - DEPOT	$ 1,512.72	
28/07/2020	MD28829.D1		WORK BOOTS - POOL INSPECTOR	$ 171.56	
24/08/2020	**2600.5719-01**	**Shire of Mundaring - Lotto Club**	**PAYROLL DEDUCTION**		**$ 271.60**
16/08/2020	PY01-04-STAFF LO		PAYROLL DEDUCTION	$ 258.02	
16/08/2020	PY02-04-STAFF LO		PAYROLL DEDUCTION	$ 13.58	
24/08/2020	**2600.6-01**	**Shire of Mundaring - Social Club**	**PAYROLL DEDUCTION**		**$ 6.00**
16/08/2020	PY01-04-MUNDARIN		PAYROLL DEDUCTION	$ 6.00	
24/08/2020	**2600.6419-01**	**Hills Fresh (WA) Pty Ltd**	**MILK**		**$ 266.43**
18/08/2020	ADMIN JULY 2020		MILK	$ 266.43	
24/08/2020	**2600.6421-01**	**Vermeer Equipment of WA & NT**	**PARTS**		**$ 151.82**
17/08/2020	113901		SUPPLY PARTS FOR 876MDG	$ 151.82	
24/08/2020	**2600.6423-01**	**Australian Training Management**	**STAFF TRAINING**		**$ 150.00**
21/08/2020	4829		STAFF FIRST AID TRAINING	$ 150.00	
24/08/2020	**2600.6732-01**	**Relationships Australia Western**	**EMPLOYEE ASSISTANCE PROGRAM**		**$ 165.00**
13/08/2020	00352149		EMPLOYEE ASSISTANCE PROGRAM	$ 165.00	
24/08/2020	**2600.68-01**	**The Watershed Water Systems**	**RETICULATION PARTS**		**$ 1,537.67**
28/07/2020	10193812		RETICULATION PARTS	$ 288.13	
28/07/2020	10193817		RETICULATION PARTS	$ 1,025.72	
30/07/2020	10193818		RETICULATION PARTS	$ 46.78	
30/07/2020	10193829		RETICULATION PARTS	$ 12.96	
31/07/2020	10193861		RETICULATION PARTS	$ 35.45	
14/08/2020	10193888		RETICULATION PARTS	$ 110.87	
14/08/2020	10193880		RETICULATION PARTS	$ 17.76	
24/08/2020	**2600.7-01**	**Australian Services Union**	**PAYROLL DEDUCTION**		**$ 155.40**
16/08/2020	PY01-04-AUSTRALI		PAYROLL DEDUCTION	$ 25.90	
16/08/2020	PY02-04-AUSTRALI		PAYROLL DEDUCTION	$ 129.50	
24/08/2020	**2600.7048-01**	**Any Envelopes**	**ENVELOPES**		**$ 409.20**
17/07/2020	00018350		ENVELOPES	$ 409.20	
24/08/2020	**2600.7318-01**	**Pirtek Midland**	**PARTS**		**$ 559.92**
14/07/2020	MD-T00031809		SUPPLY 2 X HOSES FOR VOLVO LOADER 020MDG	$ 552.66	
30/07/2020	MD-T00032092		SUPPLY OF ASSORTED HYDRAULIC HOSES & FITTINGS	$ 7.26	
24/08/2020	**2600.7554-01**	**Corrs Chambers Westgarth**	**PROFESSIONAL SERVICES**		**$ 5,360.63**
17/08/2020	6934648		PROFESSIONAL SERVICES - SALE OF LAND LOT 124 SCOTT ST	$ 3,456.20	
17/08/2020	6936944		PROFESSIONAL SERVICES - SALE OF LAND LOT 124 SCOTT ST	$ 1,904.43	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
24/08/2020	**2600.7735-01**	**West Force Plumbing & Gas**	**PLUMBING**		**$ 2,478.30**
31/07/2020	00024634		PLUMBING - WOOROLOO FIRE BRIGADE	$ 181.50	
03/08/2020	00024641		PLUMBING - LOCATE LEECH DRAIN DARLINGTON TENNIS CLUB	$ 330.00	
03/08/2020	00024644		PLUMBING - SAWYERS VALLEY OVAL HALL & CHANGE ROOMS	$ 258.50	
04/08/2020	00024637		PLUMBING - MIDVALE EARLY LEARNING CENTRE	$ 894.30	
20/08/2020	00024636		PLUMBING - MIDVALE EARLY LEARNING CENTRE	$ 814.00	
24/08/2020	**2600.7807-01**	**Water Installations**	**ELECTRICAL SERVICES**		**$ 2,154.45**
24/08/2020	00016550		ASSIST ELECTRICIAN TO FIND FAULT - MUNDARING HARDCOURTS	$ 220.00	
24/08/2020	00016976		REPLACE AIR BLOWER - MORGAN JOHN MORGAN PUBLIC TOILETS	$ 568.05	
24/08/2020	00017157		FIND FAULT AFTER ALARM TRIGGERED - MT HELENA PAVILION	$ 963.45	
24/08/2020	00017149		REPLACE FLOAT SWITCH & STROBE LIGHT - MT HELENA PAVILION	$ 402.95	
24/08/2020	**2600.7857-01**	**Ricoh Finance**	**RENTAL CHARGES**		**$ 210.10**
30/07/2020	274743		RENTAL CHARGES	$ 210.10	
24/08/2020	**2600.80-01**	**Bunnings Group Limited**	**HARDWARE**		**$ 907.79**
30/07/2020	2180/01657019		HARDWARE ITEMS	$ 574.95	
03/08/2020	2180/01936413		HARDWARE ITEMS	$ 154.11	
04/08/2020	2180/01564988		HARDWARE ITEMS	$ 8.15	
04/08/2020	2180/01564305		HARDWARE ITEMS	$ 48.47	
04/08/2020	2180/01654266		HARDWARE ITEMS	$ 77.71	
04/08/2020	2180/01562552		HARDWARE ITEMS	$ 44.40	
24/08/2020	**2600.8-01**	**LGRCEU**	**PAYROLL DEDUCTION**		**$ 41.00**
16/08/2020	PY02-04-LGRCEU		PAYROLL DEDUCTION	$ 41.00	
24/08/2020	**2600.8037-01**	**Electritech Industries**	**ELECTRICAL SERVICES**		**$ 2,190.10**
04/08/2020	13384		ELECTRICAL SERVICES - ADMIN	$ 2,190.10	
24/08/2020	**2600.8374-01**	**Natural Area Holdings P/L T/A Nature**	**EGETATION MANAGEMENT**		**$ 1,320.00**
04/08/2020	00013714		SUPPLY WEED & VEGETATION MANAGEMENT - BUNYNYONG RD	$ 1,320.00	
24/08/2020	**2600.8500-01**	**Greg Northover Pest & Weed Solution**	**PEST CONTROL**		**$ 540.10**
10/08/2020	00003573		TERMITE MONITORING - SWAN VIEW HERITAGE RAILWAY PLATFORM	$ 204.60	
10/08/2020	00003572		TERMITE MONITORING - SCOTT ST BRIDGE	$ 335.50	
24/08/2020	**2600.8545-01**	**Sankey Plumbing Service**	**PLUMBING**		**$ 1,144.00**
18/08/2020	4813		PLUMBING - HARRY RISEBOROUGH OVAL PAVILION	$ 143.00	
18/08/2020	4812		PLUMBING - CHIDLOW RECREATION GROUNDS PAVILION	$ 154.00	
18/08/2020	4811		PLUMBING - OLD PARKERVILLE PRIMARY SCHOOL	$ 209.00	
18/08/2020	4810		PLUMBING - BOYA COMMUNITY CENTRE	$ 308.00	
18/08/2020	4809		PLUMBING - MUNDARING SCULPTURE PARK PUBLIC TOILETS	$ 143.00	
18/08/2020	4808		PLUMBING - BROWN PARK YOUTH CENTRE	$ 187.00	
24/08/2020	**2600.8584-01**	**Great Sand Supplies Trust**	**GRAVEL SUPPLY**		**$ 16,405.97**
13/08/2020	00005840		SUPPLY LAWN SAND, FILL SAND & BALLAST - SAWYERS OVAL	$ 921.36	
13/08/2020	00005842		SUPPLY & DELIVER BALLAST - SAWYERS OVAL	$ 488.95	
13/08/2020	00005839		SUPPLY 25MM FERRICRETE	$ 1,364.42	
13/08/2020	00005843		SUPPLY 25MM FERRICRETE	$ 7,995.83	
13/08/2020	00005841		SUPPLY FACE GRAVEL	$ 2,888.49	
13/08/2020	00005844		SUPPLY FACE GRAVEL	$ 2,746.92	
24/08/2020	**2600.8944-01**	**Tyres For Trucks**	**TYRES**		**$ 60.00**
14/08/2020	00018205		REPAIR TYRE ON 043MDG	$ 60.00	
24/08/2020	**2600.9392-01**	**Talis Consultants Pty Ltd**	**DESIGN WORKS**		**$ 3,740.00**
13/08/2020	21100		PAVEMENT DESIGN WORKS - KEANE ST, GLEN RD & COULSTON RD	$ 3,740.00	
24/08/2020	**2600.9627-01**	**MPK Tree Management Pty Ltd**	**STREET TREE MAINTENANCE**		**$ 16,073.20**
03/08/2020	00007855		STREET TREE MAINTENANCE - SALISBURY RD SWAN VIEW	$ 8,778.00	
03/08/2020	00007854		STREET TREE MAINTENANCE - PUMP STATION MUNDARING WEIR	$ 7,295.20	
24/08/2020	**2600.9698-01**	**Managed System Services Pty Ltd**	**IT HARDWARE**		**$ 1,489.70**
04/08/2020	00006014		SOPHOS CENTRAL INTERCEPT SERVER LICENCE BUNDLE	$ 1,489.70	
24/08/2020	**2601.10698-01**	**Mrs J L Bryant**	**REIMBURSEMENT**		**$ 71.50**
20/08/2020	REIMBURSEMENT		REIMBURSEMENT - WESTERN DIAGNOSTICS PATHOLOGY EXPENSES	$ 71.50	
24/08/2020	**2601.119-01**	**Telstra**	**TELEPHONE**		**$ 633.27**
17/08/2020	0941160300		TELEPHONE CHARGES - FIRE BRIGADES	$ 633.27	
24/08/2020	**2601.13234-01**	**Mr C R Laudehr**	**REFUND**		**$ 200.00**
21/08/2020	REFUND		REFUND - PLANNING FEE NOTIFICATION	$ 200.00	
24/08/2020	**2601.13484-01**	**Mr J M Bondi**	**CROSSOVER CONTRIBUTION**		**$ 575.00**
14/08/2020	X OVER		CROSSOVER CONTRIBUTION - KINGSMILL CRES PARKERVILLE	$ 575.00	

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Date	Reference	Payee	Description	Amount	Total
24/08/2020	**2601.174-01**	**Synergy**	**ELECTRICITY**		**$ 61,038.45**
14/08/2020	2172465520		ELECTRICITY	$ 105.61	
14/08/2020	5233911527		ELECTRICITY	$ 103.83	
14/08/2020	8876289221		ELECTRICITY	$ 106.95	
14/08/2020	5045204415		ELECTRICITY	$ 116.18	
14/08/2020	8749180328		ELECTRICITY	$ 120.27	
14/08/2020	5068955212		ELECTRICITY	$ 109.02	
14/08/2020	5639936321		ELECTRICITY	$ 127.72	
14/08/2020	5125442514		ELECTRICITY	$ 107.31	
14/08/2020	5142730716		ELECTRICITY	$ 105.81	
14/08/2020	3021647529		ELECTRICITY	$ 56,490.09	
14/08/2020	3563304329		ELECTRICITY	$ 280.38	
10/08/2020	5162819914		ELECTRICITY	$ 3,265.28	
24/08/2020	**2601.355-01**	**Wesfarmers Kleenheat Gas Pty Ltd**	**GAS**		**$ 129.14**
23/07/2020	21630374		BULK GAS SERVICES - REFLECTIONS CAFE LAKE LESCHENAULTIA	$ 129.14	
24/08/2020	**2601.589-01**	**Shire of Mundaring**	**FDC PARENT LEVY**		**$ 13,353.40**
20/08/2020	200820		FDC PARENT LEVY	$ 13,353.40	
24/08/2020	**2601.7543-01**	**Ms L Joy**	**REIMBURSEMENT**		**$ 105.00**
24/08/2020	REIMBURSEMENT		REIMBURSEMENT - COVID-19 SPRAY BOTTLES & WELCOME BACK FLOWERS	$ 105.00	
27/08/2020	**2602.34-01**	**Water Corporation**	**WATER RATES & FEES**		**$ 3,793.70**
27/08/2020	9004679816		WATER RATES & FEES	$ 128.94	
27/08/2020	9004705199		WATER RATES & FEES	$ 22.66	
27/08/2020	9004679832		WATER RATES & FEES	$ 211.51	
27/08/2020	9004679808		WATER RATES & FEES	$ 57.91	
27/08/2020	9012388904		WATER RATES & FEES	$ 875.02	
27/08/2020	9004707493		WATER RATES & FEES	$ 148.56	
27/08/2020	9004680788		WATER RATES & FEES	$ 147.94	
27/08/2020	9018371679		WATER RATES & FEES	$ 10.07	
27/08/2020	9004679541		WATER RATES & FEES	$ 83.02	
27/08/2020	9004679998		WATER RATES & FEES	$ 256.48	
27/08/2020	9004679971		WATER RATES & FEES	$ 108.12	
27/08/2020	9004684543		WATER RATES & FEES	$ 203.49	
27/08/2020	9015634496		WATER RATES & FEES	$ 40.29	
27/08/2020	9004680614		WATER RATES & FEES	$ 188.85	
27/08/2020	9004687154		WATER RATES & FEES	$ 73.02	
27/08/2020	9004679509		WATER RATES & FEES	$ 623.58	
27/08/2020	9004678303		WATER RATES & FEES	$ 334.89	
27/08/2020	9004707805		WATER RATES & FEES	$ 90.65	
27/08/2020	9004679824		WATER RATES & FEES	$ 50.36	
27/08/2020	9004683970		WATER RATES & FEES	$ 138.34	
27/08/2020	**2603.3462-01**	**Care Giver Subsidies**	**CARE GIVER SUBSIDIES**		**$ 35,545.19**
27/08/2020	270820		CARE GIVER SUBSIDIES	$ 35,545.19	
31/08/2020	**2604.11135-01**	**Frontline Fire & Rescue Equipment**	**EQUIPMENT PURCHASES**		**$ 846.79**
10/08/2020	68492		EQUIPMENT PURCHASES - GLEN FORREST VBFB	$ 846.79	
31/08/2020	**2604.11161-01**	**AXIIS Contracting Pty Ltd**	**EARTHWORKS**		**$ 12,256.55**
20/08/2020	5481		SUPPLY & CONSTRUCT CONCRETE CROSSOVERS - HUDSON ST GLEN FORREST	$ 12,256.55	
31/08/2020	**2604.11326-01**	**Learning Seat Pty Ltd**	**SUBSCRIPTIONS**		**$ 1,825.99**
28/08/2020	6477005843		SUBSCRIPTION FEE FOR 28/06/2020 TO 28/07/2020	$ 1,825.99	
31/08/2020	**2604.11398-01**	**JB HI-FI Group Pty Ltd**	**IT HARDWARE**		**$ 4,954.10**
10/07/2020	BD0185537		SUPPLY APPLE IPHONE 11 128GB & APPLE IPHONE 64GB	$ 2,323.19	
13/07/2020	BD0186286		SUPPLY APPLE IPHONE 11 64GB	$ 1,179.48	
13/07/2020	BD0186062		SUPPLY APPLE IPAD 7TH GEN 32GB	$ 714.51	
14/07/2020	BD0188084		SUPPLY APPLE IPHONE SE 64GB	$ 736.92	
31/08/2020	**2604.11413-01**	**Ergolink (Max & Claire Pty Ltd T/A)**	**OFFICE FURNITURE**		**$ 332.50**
07/08/2020	SI-00070665		OFFICE FURNITURE	$ 332.50	
31/08/2020	**2604.11474-01**	**Swan Valley Fresh (Vendor Management**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 54.53**
24/08/2020	00029387		PROVISIONS FOR REFLECTIONS CAFE	$ 54.53	
31/08/2020	**2604.12057-01**	**Goldfields Tourism Network Associate**	**BOOKS**		**$ 158.19**
07/08/2020	INV-1672		SUPPLY 6 X GOLDEN QUEST DISCOVERY TRAIL GUIDEBOOKS	$ 158.19	
31/08/2020	**2604.12078-01**	**Recruitwest Pty Ltd**	**TEMP STAFF**		**$ 6,683.80**
25/08/2020	C INV 572827		TEMP STAFF - DEPOT	$ 6,683.80	
31/08/2020	**2604.12134-01**	**W.A. Library Supplies**	**STATIONERY ITEMS**		**$ 184.90**
10/08/2020	00122557		STATIONERY ITEMS	$ 184.90	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description	Amount	Total
31/08/2020	**2604.12261-01**	**ONEMUSIC AUSTRALIA (Australasian**	**SUBSCRIPTIONS**		**$ 20.65**
18/08/2020	050262		APRA MUSIC LICENCE FEE 01/07/20 TO 30/09/2020	$ 20.65	
31/08/2020	**2604.12336-01**	**MBC Trees and Bobcat**	**MITIGATION WORKS**		**$ 3,982.00**
24/08/2020	797-2020		MITIGATION WORKS - HIDDEN VALLEY/HIGHLAND DR PARKEVILLE	$ 3,982.00	
31/08/2020	**2604.12415-01**	**Advance Scanning Services**	**SERVICE LOCATION**		**$ 1,848.00**
13/08/2020	20165142		SERVICE LOCATION - BARUSSELA AVE GREENMOUNT	$ 1,848.00	
31/08/2020	**2604.12451-01**	**Rainchaser Pumps and Reticulation**	**PARTS**		**$ 53.94**
28/08/2020	INV-1264		PARTS FOR P1004	$ 53.94	
31/08/2020	**2604.12470-01**	**Mr G Wood**	**FENCING**		**$ 2,766.50**
25/08/2020	IV00000000074		REPAIR ACCESS GATE - HARRY RISEBOROUGH TENNIS COURT	$ 1,001.00	
27/08/2020	IV00000000047		SUPPLY & INSTALL BOLLARDS - GLEN FORREST HALL	$ 1,765.50	
31/08/2020	**2604.12514-01**	**Nature Photography by Nathan**	**PRINTING**		**$ 52.80**
21/08/2020	026		SUPPLY 2 X PRINTS OF LOCAL FAUNA TO VISITOR CENTRE	$ 52.80	
31/08/2020	**2604.12577-01**	**Mahogany Creek Progress Association**	**CLEANING MATERIALS**		**$ 500.00**
28/08/2020	INV-0031		CLEANING MATERIALS FOR MAHOGANY CREEK PUBLIC TOILET BLOCK FOR 2019/2020	$ 500.00	
31/08/2020	**2604.12579-01**	**Mr V Crowe**	**LANDSCAPE & CLEANING SERVICES**		**$ 840.00**
25/08/2020	1530		CLEANING SERVICES	$ 210.00	
25/08/2020	1531		LANDSCAPE SERVICES	$ 210.00	
25/08/2020	1529		LANDSCAPE SERVICES	$ 210.00	
25/08/2020	1532		LANDSCAPE SERVICES	$ 210.00	
31/08/2020	**2604.12585-01**	**Ms C Nelson**	**WELCOME TO COUNTRY**		**$ 500.00**
28/08/2020	24		WELCOME TO COUNTRY CITIZENSHIP CEREMONY 16/07/2020	$ 500.00	
31/08/2020	**2604.12640-01**	**Officeworks Ltd**	**IT HARDWARE**		**$ 68.00**
10/08/2020	11174475		SUPPLY LOGITECH WIRELESS KEYBOARD & MOUSE	$ 68.00	
31/08/2020	**2604.12751-01**	**Sprayline Spraying Equipment**	**EQUIPMENT**		**$ 121.24**
11/08/2020	30631		REFURBISH 2 WEED SPRAYING HAND GUNS	$ 121.24	
31/08/2020	**2604.12794-01**	**Mount Helena Hardware**	**HARDWARE ITEMS**		**$ 162.95**
14/08/2020	18366		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 47.65	
14/08/2020	18693		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 29.95	
14/08/2020	18543		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 28.20	
14/08/2020	18657		SUPPLY OF ASSORTED HARDWARE ITEMS	$ 57.15	
31/08/2020	**2604.12866-01**	**From Scratch Small Event Catering**	**PROVISIONS FOR REFLECTIONS CAFE**		**$ 63.00**
24/08/2020	992		PROVISIONS FOR REFLECTIONS CAFE	$ 63.00	
31/08/2020	**2604.12899-01**	**NAPA (A Division of GPC Asia Pacific**	**WORKSHOP CONSUMABLES**		**$ 753.03**
14/08/2020	1320086453		SUPPLY OF WORKSHOP CONSUMABLES	$ 89.44	
14/08/2020	1320086797		SUPPLY OIL FILTERS FOR P4800 & P4891	$ 48.40	
14/08/2020	1320087473		SUPPLY OF WORKSHOP CONSUMABLES	$ 429.29	
14/08/2020	1320087715		SUPPLY ROTATING FLASHING BEACON FOR P261	$ 185.90	
31/08/2020	**2604.12938-01**	**Aussie Broadband Pty Ltd**	**NBN FTTN & VOIP CHARGES**		**$ 4,114.14**
25/08/2020	8517007		NBN FTTN, VOIP CHARGES & SIP TRUNK	$ 3,369.14	
25/08/2020	8468214		ROUTER FOR CHIDLOW FIRE BRIGADE	$ 149.00	
25/08/2020	8468192		ROUTER FOR WOOROLOO VBFB	$ 149.00	
25/08/2020	8468226		ROUTER FOR STONEVILLE VBFB	$ 149.00	
25/08/2020	8468206		ROUTER FOR PARKERVILLE VBFB	$ 149.00	
25/08/2020	8468346		ROUTER FOR GLEN FORREST VBFB	$ 149.00	
31/08/2020	**2604.12951-01**	**Traffic Force**	**TRAFFIC MANAGEMENT SERVICES**		**$ 60,542.62**
16/07/2020	00020733		TRAFFIC MANAGEMENT SERVICES - WORKS CREWS	$ 3,547.71	
21/07/2020	00020732		TRAFFIC MANAGEMENT SERVICES - DRAINAGE WORKS	$ 6,498.28	
28/07/2020	00020394		TRAFFIC MANAGEMENT SERVICES - TREE MAINTENANCE	$ 2,458.81	
28/07/2020	00020393		TRAFFIC MANAGEMENT SERVICES - WORKS CREW SHOULDER & BITUMEN SEAL	$ 4,285.35	
10/08/2020	00020971		TRAFFIC MANAGEMENT SERVICES - WATER LEAK REPAIRS LEATHER GREEN SAWYERS VALLEY	$ 1,299.65	
10/08/2020	00020890		TRAFFIC MANAGEMENT SERVICES - TREE MAINTENANCE	$ 4,202.08	
10/08/2020	00020964		TRAFFIC MANAGEMENT SERVICES - TREE MAINTENANCE	$ 5,178.78	
13/08/2020	00020970		TRAFFIC MANAGEMENT SERVICES - WORKS CREWS	$ 2,985.69	
28/07/2020	00020770		TRAFFIC MANAGEMENT SERVICES - WORKS CREWS	$ 5,220.16	
28/07/2020	00020768		TRAFFIC MANAGEMENT SERVICES - DRAINAGE MAINTENANCE	$ 5,128.38	
31/07/2020	00020392		TRAFFIC MANAGEMENT SERVICES - DRAINAGE WORKS	$ 4,250.21	
03/08/2020	00020902		TRAFFIC MANAGEMENT SERVICES - DRAINAGE WORKS	$ 4,390.73	
03/08/2020	00020903		TRAFFIC MANAGEMENT SERVICES - WORKS CREWS	$ 5,031.27	
10/08/2020	00020967		TRAFFIC MANAGEMENT SERVICES - DRAINAGE WORKS	$ 6,065.52	
31/08/2020	**2604.12995-01**	**Across Planning (Larry Guise Planni**	**PROFESSIONAL PLANNING SERVICES**		**$ 3,421.00**
03/08/2020	00120		MUNDARING MULTIPURPOSE COMMUNITY FACILITY - WORKS COMPLETED 2 JULY 2020	$ 3,421.00	

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Date	Reference	Payee	Description	Amount	Total
31/08/2020	**2604.13013-01**	**MDM Entertainment Pty Ltd**	**STOCK FOR LIBRARIES**		**$ 432.56**
25/08/2020	91563		STOCK FOR LIBRARIES	$ 320.44	
25/08/2020	91046		STOCK FOR LIBRARIES	$ 112.12	
31/08/2020	**2604.13059-01**	**Mundaring Tyrepower (AnK Murphy Pty**	**TYRES**		**$ 556.00**
13/08/2020	103214		SUPPLY & FIT 4 X NEW TYRES TO 809MDG	$ 556.00	
31/08/2020	**2604.13097-01**	**Survey Civil**	**DRAINAGE WORKS**		**$ 770.00**
25/08/2020	036		INSTALL DRAIN COVERS & PLASMACUT TO SIZE - MUNDARING ARENA	$ 770.00	
31/08/2020	**2604.13163-01**	**Toll Transport Pty Ltd**	**COURIER SERVICES**		**$ 66.02**
10/08/2020	0439-S364420		COURIER SERVICES	$ 66.02	
31/08/2020	**2604.13230-01**	**Mundaring Toastmaster Club (District**	**PUBLIC SPEAKING WORKSHOP**		**$ 500.00**
27/08/2020	2020001		PUBLIC SPEAKING WORKSHOP HELD ON 30/01/2020	$ 500.00	
31/08/2020	**2604.13235-01**	**Landmark Products Pty Ltd**	**DRINK FOUNTAIN**		**$ 2,926.00**
28/07/2020	124323		SUPPLY & DELIVER 1 X CASCADE DRINK FOUNTAIN - MUNDARING ARENA	$ 2,926.00	
31/08/2020	**2604.13278-01**	**Safeway Building & Renovations Pty**	**MAINTENANCE**		**$ 8,770.00**
28/08/2020	3829		REPLACE BARGE BOARDS & FACIA BOARDS - MUNDARING TOWN HALL	$ 8,770.00	
31/08/2020	**2604.13345-01**	**ABM Landscaping (Mikevie Pty Ltd T/**	**LANDSCAPING**		**$ 275.00**
18/08/2020	INV-0467		MULCHING WORKS - MORGAN JOHN MORGAN	$ 275.00	
31/08/2020	**2604.13368-01**	**Midland Nissan and Isuzu (Idom Midl**	**PARTS**		**$ 20.06**
20/08/2020	62021735		SUPPLY FRONT WHEEL STUD & NUT FOR 069MDG	$ 20.06	
31/08/2020	**2604.13389-01**	**Fos Energy (Pae Fos Pty Ltd T/As:)**	**SOLAR PV SYSTEM**		**$ 11,691.11**
28/08/2020	IV00144		SUPPLY & INSTALL SOLAR PV SYSTEM - BOYA COMMUNITY CENTRE	$ 3,376.38	
28/08/2020	IV00145		SUPPLY & INSTALL SOLAR PV SYSTEM - MUNDARING ARENA	$ 8,314.73	
31/08/2020	**2604.13454-01**	**Murdock Recruitment Pty Ltd**	**RELIEF STAFF**		**$ 412.34**
20/08/2020	I0002336		RELIEF STAFF - MECPC	$ 412.34	
31/08/2020	**2604.13457-01**	**Creative Painting Perth**	**PAINTING SERVICES**		**$ 4,620.00**
20/08/2020	571		INTERNAL PAINTING SERVICES - SCFC	$ 4,620.00	
31/08/2020	**2604.13482-01**	**J Prestipino Building Designs Pty L**	**DESIGN FEES**		**$ 3,762.00**
25/08/2020	910/10-08/3		SUPPLY 4X DESIGN PLANS - PTA APPROVED & PROPOSED BUS SHELTERS/PADS	$ 3,762.00	
31/08/2020	**2604.13487-01**	**Robertson Hayles Lawyers Pty Ltd**	**LEGAL MATTER**		**$ 4,768.50**
21/08/2020	012729		LEGAL MATTER 202008257 - EMPLOYMENT ADVICE	$ 4,768.50	
31/08/2020	**2604.138-01**	**Sonic HealthPlus Pty Ltd**	**MEDICAL EXAMINATION**		**$ 231.00**
25/08/2020	2132101		PRE-EMPLOYMENT MEDICAL EXAMINATION	$ 231.00	
31/08/2020	**2604.146-01**	**Eastern Hills Saws & Mowers Pty Ltd**	**PARTS**		**$ 213.50**
25/08/2020	45459 # 6		SUPPLY OF WORKSHOP CONSUMABLES	$ 168.50	
25/08/2020	45175 # 11		SUPPLY OF VARIOUS SMALL PARTS FOR WORKSHOP	$ 45.00	
31/08/2020	**2604.1689-01**	**Compsys Pty Ltd T/A Harmony Software**	**SOFTWARE EXPENSES**		**$ 524.70**
10/08/2020	3-624		SOFTWARE SUBSCRIPTIONS	$ 524.70	
31/08/2020	**2604.1955-01**	**Cleanaway**	**RECYCLING FEES**		**$ 69,523.65**
14/08/2020	21590953		RECYCLING FEES	$ 69,523.65	
31/08/2020	**2604.21-01**	**Eastern Metropolitan Regional Council**	**TRANSFER STATION FEES**		**$ 45,929.46**
25/08/2020	EMRC35489		TRANSFER STATION FEES	$ 45,929.46	
31/08/2020	**2604.2163-01**	**Asphaltech Pty Ltd**	**ASPHALT**		**$ 88,145.46**
28/08/2020	12656		ASPHALT WORKS - HUDSON ST GLEN FORREST	$ 88,145.46	
31/08/2020	**2604.2165-01**	**Country Womens Association of WA In**	**CATERING**		**$ 635.00**
20/08/2020	120		CATERING SERVICES - STONEVILLE FIRE SCHOOL	$ 635.00	
31/08/2020	**2604.218-01**	**Security & Key Distributors**	**SECURITY EQUIPMENT**		**$ 130.49**
28/08/2020	85464		SUPPLY 4 X BILOCK KEYS - SWAN VIEW TENNIS COURTS	$ 130.49	
31/08/2020	**2604.234-01**	**Coles Supermarkets Australia Pty Lt**	**KIOSK SUPPLIES**		**$ 393.01**
13/08/2020	107607759		FOOD & CONSUMABLES FOR CHILDREN & STAFF - MECPC	$ 393.01	
31/08/2020	**2604.2625-01**	**Stewart & Heaton Clothing Co**	**UNIFORMS**		**$ 1,154.32**
04/08/2020	SIN-3236156		UNIFORMS - DARLINGTON VBFB	$ 183.68	
04/08/2020	SIN-3236148		UNIFORMS - GLEN FORREST VBFB	$ 253.79	
04/08/2020	SIN-3236147		UNIFORMS - MT HELENA VBFB	$ 183.68	
10/08/2020	SIN-3236712		UNIFORMS - PARKERVILLE VBFB	$ 68.77	
10/08/2020	SIN-3236685		UNIFORMS - PARKERVILLE VBFB	$ 97.04	
04/08/2020	SIN-3236154		UNIFORMS - DARLINGTON VBFB	$ 367.36	
31/08/2020	**2604.280-01**	**Winc Australia Pty Limited**	**STATIONERY**		**$ 258.43**
07/08/2020	9033340334		STATIONERY ITEMS	$ 258.43	
31/08/2020	**2604.2802-01**	**Holton Connor Architects & Planners**	**ARCHITECTURAL SERVICES**		**$ 4,411.00**
07/08/2020	00006195		ADMINISTRATION & SUPERINTENDENCE - MUNDARING ARENA	$ 528.00	
28/08/2020	00006196		ACCESSIBILITY UPGRADE PARKERVILLE OVAL & MORGAN JOHN MORGAN PUBLIC TOILETS	$ 3,883.00	

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Date	Reference	Payee	Description	Amount	Total
31/08/2020	**2604.300-01**	**Civica Pty Ltd**	**FEES**		**$ 13,002.46**
27/08/2020	M/LG016438		AUTHORITY WEB PLATFORM LICENCE 01/10/2019 - 30/09/2020	$ 13,002.46	
31/08/2020	**2604.307-01**	**McLeods Barristers and Solicitors**	**LEGAL MATTER**		**$ 1,324.35**
27/08/2020	114411		LEGAL MATTER 44773 - PLANNING PROSECUTION	$ 939.05	
27/08/2020	113638		LEGAL MATTER 45669 - COMPLIANCE ISSUE UNLAWFUL SIGNAGE	$ 385.30	
31/08/2020	**2604.3088-01**	**Local Government Professionals**	**SUBSCRIPTIONS**		**$ 531.00**
13/08/2020	17727		MEMBERSHIP SUBSCRIPTION 2020/2021 - KIRK KITCHIN	$ 531.00	
31/08/2020	**2604.314-01**	**Landgate**	**TITLE SEARCHES**		**$ 506.30**
25/08/2020	357770-10000974		GROSS RENTAL VALUATIONS CHARGEABLE	$ 104.71	
25/08/2020	358054-10000974		GROSS RENTAL VALUATIONS CHARGEABLE	$ 203.34	
25/08/2020	356272-10000974		CONSOLIDATED MINING TENEMENT ROLL	$ 198.25	
31/08/2020	**2604.3232-01**	**Turfworks WA Pty Ltd**	**MOWING**		**$ 5,994.60**
25/08/2020	4869		MOWING SERVICES	$ 2,202.19	
25/08/2020	4870		MOWING SERVICES	$ 2,101.71	
25/08/2020	4874		MOWING SERVICES	$ 1,690.70	
31/08/2020	**2604.33-01**	**Boral Construction Materials Group**	**ASPHALT**		**$ 2,786.08**
03/08/2020	WA15402399		ASPHALT	$ 157.63	
03/08/2020	WA15402400		ASPHALT	$ 157.63	
13/08/2020	WA15412264		ASPHALT	$ 157.63	
13/08/2020	WA15412265		ASPHALT	$ 157.63	
14/07/2020	WA15358690		SUPPLY 150L EMULSION	$ 264.00	
14/07/2020	WA15355756		ASPHALT	$ 157.63	
14/07/2020	WA15355757		ASPHALT	$ 157.63	
14/07/2020	WA15355758		ASPHALT	$ 157.63	
14/07/2020	WA15355759		ASPHALT	$ 157.63	
20/07/2020	WA15368041		ASPHALT	$ 157.63	
20/07/2020	WA15368042		ASPHALT	$ 157.63	
24/07/2020	WA15379520		ASPHALT	$ 157.63	
24/07/2020	WA15379521		ASPHALT	$ 157.63	
28/07/2020	WA15386263		ASPHALT	$ 157.63	
28/07/2020	WA15386264		ASPHALT	$ 157.63	
28/07/2020	WA15394306		ASPHALT	$ 157.63	
28/07/2020	WA15394307		ASPHALT	$ 157.63	
31/08/2020	**2604.3445-01**	**Quick Corporate Australia**	**STATIONERY**		**$ 42.64**
21/08/2020	SIN-01231370		STATIONERY ITEMS	$ 42.64	
31/08/2020	**2604.381-01**	**Mundaring Electrical Contracting Se**	**ELECTRICAL SERVICES**		**$ 198.00**
27/08/2020	7126		ELECTRICAL SERVICES - WOOROLOO VBFB	$ 198.00	
31/08/2020	**2604.385-01**	**Mundaring News & Lotto**	**SUBSCRIPTIONS**		**$ 616.83**
07/08/2020	6234		MAGAZINE SUBSCRIPTIONS	$ 616.83	
31/08/2020	**2604.386-01**	**Educational Art Supplies**	**ART SUPPLIES**		**$ 63.14**
11/08/2020	3492520		ART SUPPLIES	$ 63.14	
31/08/2020	**2604.388-01**	**Bunzl Ltd**	**CLEANING SUPPLIES**		**$ 927.43**
27/07/2020	V644555		PAPER PRODUCTS - DEPOT	$ 691.02	
30/07/2020	V655305		PAPER PRODUCTS - DEPOT	$ 236.41	
31/08/2020	**2604.4407-01**	**Aardvark Bobcat & Truck Hire**	**HIRE OF PLANT**		**$ 4,175.82**
25/08/2020	#774		HIRE OF PLANT	$ 4,175.82	
31/08/2020	**2604.4560-01**	**Flexi Staff Pty Ltd**	**TEMP STAFF**		**$ 962.35**
25/08/2020	I0001179		TEMP STAFF - DEPOT	$ 962.35	
31/08/2020	**2604.52-01**	**Western Educting Service**	**HIRE OF PLANT**		**$ 12,900.90**
27/08/2020	00000926		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,612.61	
27/08/2020	00000928		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,612.61	
27/08/2020	00000929		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,658.69	
27/08/2020	00000930		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,658.69	
27/08/2020	00000931		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,612.61	
27/08/2020	00000933		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,474.39	
27/08/2020	00000935		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,658.69	
27/08/2020	00000936		DRAIN EDUCTING / JETTING AT VARIOUS LOCATIONS	$ 1,612.61	
31/08/2020	**2604.5943-01**	**Lyons Airconditioning Services WA P**	**EQUIPMENT REPAIRS**		**$ 904.75**
25/08/2020	40041726		REPAIR AIR CONDITIONER IN 818MDG	$ 904.75	
31/08/2020	**2604.5945-01**	**West Coast Spring Water Pty Ltd**	**CAFE BAR CONSUMABLES**		**$ 7.00**
25/08/2020	1738442		WATER BOTTLE FOR KSP LIBRARY	$ 7.00	

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Date	Reference	Payee	Description	Amount	Total
31/08/2020	**2604.68-01**	**The Watershed Water Systems**	**RETICULATION PARTS**		**$ 158.00**
14/08/2020	10193988		RETICULATION PARTS	$ 98.00	
14/08/2020	10193995		RETICULATION PARTS	$ 60.00	
31/08/2020	**2604.7009-01**	**Allerding & Associates (Allplan Pty**	**PROFESSIONAL SERVICES**		**$ 16,743.08**
27/08/2020	MUNL48RZ2020-317		PROFESSIONAL FEE - REZONING NORTH STONEVILLE PROPOSAL	$ 5,885.00	
27/08/2020	MUNL48RZ2020-316		PROFESSIONAL FEE - REZONING NORTH STONEVILLE PROPOSAL	$ 10,858.08	
31/08/2020	**2604.7347-01**	**Humes Wembley Cement (Holcim Austra**	**CONCRETE PRODUCTS**		**$ 2,852.14**
16/07/2020	9407020289		CONCRETE PRODUCTS	$ 2,582.64	
31/07/2020	9407048765		CONCRETE PRODUCTS	$ 269.50	
31/08/2020	**2604.7489-01**	**Sparks Refrigeration & Aircondition**	**ELECTRICAL SERVICES**		**$ 1,483.08**
10/08/2020	INV-2009		INVESTIGATE COMPRESSOR TRIPPING OUT - ADMIN BUILDING	$ 385.00	
18/08/2020	INV-2008		CLEAN AIR CONDITIONER FILTERS - ADMIN BUILDING	$ 1,098.08	
31/08/2020	**2604.7735-01**	**West Force Plumbing & Gas**	**PLUMBING**		**$ 3,524.70**
10/08/2020	00024763		PLUMBING - MT HELENA OVAL	$ 370.70	
11/08/2020	00024751		PLUMBING - DARLINGTON OVAL	$ 250.00	
13/08/2020	00024753		PLUMBING - DARLINGTON OVAL	$ 209.00	
14/08/2020	00024759		PLUMBING - SHIRE DEPOT	$ 315.00	
17/08/2020	00024757		PLUMBING - SAWYERS VALLEY OVAL	$ 400.00	
17/08/2020	00024762		PLUMBING - SAWYERS VALLEY OVAL	$ 1,980.00	
31/08/2020	**2604.8037-01**	**Electritech Industries**	**TESTING & TAGGING**		**$ 253.66**
04/08/2020	13389		TESTING & TAGGING - MIDVALE EARLY CHILDHOOD CENTRE	$ 253.66	
31/08/2020	**2604.8374-01**	**Natural Area Holdings P/L T/A Nature**	**PLANTS**		**$ 2,218.59**
11/08/2020	00013733		SUPPLY OF TUBE STOCK FOR REVEGETATION	$ 898.59	
11/08/2020	00013755		SUPPLY WEED & VEGETATION MANAGEMENT - BUNYNYONG RD	$ 1,320.00	
31/08/2020	**2604.8545-01**	**Sankey Plumbing Service**	**PLUMBING**		**$ 275.00**
25/08/2020	4821		PLUMBING - ADMIN BUILDING	$ 121.00	
25/08/2020	4819		PLUMBING - HUB OF THE HILLS	$ 154.00	
31/08/2020	**2604.8652-01**	**Quality Press**	**PRINTED MATERIAL**		**$ 179.30**
25/08/2020	INV037364		DFES PRINTED MATERIAL	$ 179.30	
31/08/2020	**2604.8976-01**	**Kool Line Electrical & Refrigeration**	**ELECTRICAL SERVICES**		**$ 5,900.00**
25/08/2020	00126560		ELECTRICAL SERVICES - MT HELENA OVAL & TENNIS CLUB	$ 2,950.00	
25/08/2020	00126559		ELECTRICAL SERVICES - MUNDARING ARENA	$ 2,950.00	
31/08/2020	**2604.9512-01**	**Australian Grown**	**UNIFORMS**		**$ 421.08**
28/08/2020	SI28949		UNIFORMS FOR CASUAL STAFF - MUNDARING ARENA	$ 421.08	
31/08/2020	**2604.9596-01**	**Brice Pest Management**	**PEST CONTROL**		**$ 1,408.00**
14/08/2020	IV03869		PEST CONTROL - MIDVALE CHILD CARE CENTRE	$ 242.00	
27/08/2020	03799		TERMITE TREATMENT - VERGE AT TREETOP WAY MT HELENA	$ 132.00	
27/08/2020	03781		TERMITE TREATMENT - GOSLIN RD SAWYERS VALLEY	$ 154.00	
28/08/2020	03783		TERMITE BAITING SYSTEM RENEWAL - STATION MASTERS HOUSE	$ 880.00	
31/08/2020	**2604.969-01**	**Slater Gartrell Sports**	**SPORTING EQUIPMENT**		**$ 88.00**
28/08/2020	SG41407/01		SUPPLY 2 X SIZE 5 GILBERT NETBALLS	$ 88.00	
31/08/2020	**2604.9698-01**	**Managed System Services Pty Ltd**	**MSS DEVELOPMENT SERVICES**		**$ 82,500.00**
25/08/2020	00006036		MSS DEVELOPMENT SERVICES - 1000 HOURS	$ 82,500.00	
31/08/2020	**2604.9935-01**	**All Fence U Rent Pty Ltd**	**TEMP FENCING HIRE**		**$ 453.75**
27/08/2020	00032297		HIRE TEMP FENCING - HELENA VALLEY RD SHOPPING CENTRE	$ 385.00	
28/08/2020	00032347		HIRE TEMP FENCING - MDG ARENA (UPPER LANDING WORKS)	$ 68.75	
31/08/2020	**2605.12599-01**	**Department of Mines, Industry**	**MUNDARING BSL**		**$ 13,883.80**
28/08/2020	JULY 2020		MUNDARING BSL JULY 2020	$ 13,883.80	
31/08/2020	**2605.13473-01**	**Mr T K Manson**	**CROSSOVER CONTRIBUTION**		**$ 146.00**
28/08/2020	REFUND		REFUND - CLEARANCE FEE AT BERESFORD GDSN PAID TWICE	$ 146.00	
31/08/2020	**2605.13495-01**	**Ms S Harlow**	**REIMBURSEMENT**		**$ 260.00**
28/08/2020	REIMBURSEMENT		REIMBURSEMENT - WOODEN KITCHENETTE BABIES ROOM MECPC	$ 260.00	
31/08/2020	**2605.13496-01**	**Ms L Green**	**REFUND**		**$ 579.20**
28/08/2020	REFUND		REFUND - PARKERVILLE HALL BOOKING FOR WEDDING CANCELLED	$ 579.20	
31/08/2020	**2605.174-01**	**Synergy**	**ELECTRICITY**		**$ 1,564.01**
14/08/2020	5147790712		ELECTRICITY	$ 119.22	
14/08/2020	0239507529		ELECTRICITY	$ 126.54	
14/08/2020	5087811715		ELECTRICITY	$ 109.37	
17/08/2020	5134764810		ELECTRICITY	$ 237.00	
17/08/2020	5176146311		ELECTRICITY	$ 702.19	
28/08/2020	5176146213		ELECTRICITY	$ 117.45	
28/08/2020	5172433125		ELECTRICITY	$ 152.24	

MONTHLY PAYMENTS LIST OF ACCOUNTS - AUGUST 2020

Date	Reference	Payee	Description		Amount		Total
31/08/2020	**2605.589-01**	**Shire of Mundaring**	**FDC PARENT LEVY**			**$**	**123,488.92**
17/08/2020	RUBBISH SERVICES		RUBBISH SERVICES 2020/2021 - ROADSIDE	$	35,128.91		
17/08/2020	RUBBISH SERVICES		RUBBISH SERVICES 2020/2021 - RECREATION GROUNDS	$	20,664.00		
17/08/2020	RUBBISH SERVICES		RUBBISH SERVICES 2020/2021 - STREET BINS	$	336.00		
17/08/2020	RUBBISH SERVICES		RUBBISH SERVICES 2020/2021 - HALLS	$	3,024.00		
17/08/2020	RUBBISH SERVICES		RUBBISH SERVICES 2020/2021 - DOMESTIC REC GROUNDS/HALLS	$	20,048.00		
17/08/2020	RUBBISH SERVICES		RUBBISH SERVICES 2020/2021 - BULK LIFT REC GROUNDS/HALL	$	10,580.00		
17/08/2020	RUBBISH SERVICES		RUBBISH SERVICES 2020/2021	$	16,566.00		
27/08/2020	270820		FDC PARENT LEVY	$	13,496.13		
28/08/2020	RETENTION		RETENTION SOLAR PV - BOYA COMMUNITY CENTRE & MUNDARING ARENA	$	3,170.88		
28/08/2020	JULY 2020		BUILDING SERVICES LEVY - JULY 2020	$	475.00		
31/08/2020	**2605.858-01**	**Eastern Hills Netball Association**	**REFUND**			**$**	**3,696.00**
28/08/2020	REFUND		REFUND - CALCULATION ERROR MADE TO SENIOR PLAYER 2019 SUMMER SEASON	$	3,696.00		
31/08/2020	**2605.9703-01**	**Riding for the Disabled WA Hills Gr**	**GRANT**			**$**	**2,552.55**
24/08/2020	GRANT		COVID-19 RELIEF & RECOVERY - RECONNECT GRANT	$	2,552.55		
			Total Electronic Funds Transfers From Municipal Account	**$**	**3,515,887.37**	**$**	**3,515,887.37**
Payments By Electronic Funds Transfer (Payroll)							
5/08/2020	PP03/21 cycle 1	Pay Summary		$	362,886.41		
5/08/2020	PP03/21 cycle 2	Pay Summary		$	98,007.59		
19/08/2020	PP04/21 cycle 1	Pay Summary		$	365,347.72		
19/08/2020	PP04/21 cycle 2	Pay Summary		$	101,476.28		
			Total Payroll Payments Direct From Municipal Account	**$**	**927,718.00**		
Payment By Direct Debit From Municipal Account							
		Bendigo - Merch Bank Fees		$	3,323.16		
		Bendigo - Direct Debit Fees		$	310.53		
		Commonwealth Bank - Bpoint Fees		$	527.33		
		NAB - Purchase Cards		$	13,614.29		
		Fleetcare - Fuel Payments		$	3,297.62		
		HP Financial Services - Equipment Lease		$	6,638.50		
		Konica Minolta - Printer Lease		$	3,414.52		
		WA Treasury Corporation		$	91,888.81		
		RMS - Lakes Monthly License Fee		$	163.90		
		RMS - Monthly SMS Fees		$	26.18		
		WEX Motorpass		$	106.81		
		Qikkids - Fees		$	216.04		
		Windcave - Merchant Fees		$	55.00		
			Total Electronic Fund Payments Direct From Municipal Account	**$**	**123,582.69**		

11.0 ELECTED MEMBERS MOTIONS OF WHICH PREVIOUS NOTICE HAS BEEN GIVEN

12.0 URGENT BUSINESS (LATE REPORTS)

13.0 CONFIDENTIAL REPORTS

Nil

14.0 CLOSING PROCEDURES

14.1 Date, Time and Place of the Next Meeting

The next Ordinary Council meeting will be held on Tuesday, 10 November 2020 at 6.30pm in the Council Chamber.

14.2 Closure of the Meeting