APPLICATION FOR AN EXTRACTIVE INDUSTRY LICENCE

1. Name: Planning Solutions (Aust) Pty Ltd	(Applicant)
2. Address: PO Box 8701, Perth BC WA 6849	
3. Telephone: 9227 7970	Facsimile: 9227 7971
4. Address and locality of proposed excavation site: Various lots - see Attached Schedule - Keysbrook	
5. Lot No.: See Attached Schedule	6. Location No.:
7. Plan or Diagram No.:	
8. Certificate of Title Volume:	Folio:
9. Owner of the land: Various Land Owners - See Attached Schedule	
10. Address of owner of the land: See Attached Schedule	
11. Material to be excavated (type and amount): Mineral Sands	
12. If the application covers land that is the subject of an existing licence: N/A	
Date of Issue of that licence: N/A	
Date of expiration of that licence: N/A	
Conditions applicable to that licence: N/A	
13. Term of licence sought: 12 years	
14. Submitted with this application are: See Attached Report	
a) 3 copies of excavation site plans	
b) 3 copies of works and excavation programme	
c) 3 copies of rehabilitation and decommissioning programme	
d) datum peg evidence	
e) licensed surveyor's certificate certifying the correctness of (a) and (d)	
f) evidence of compliance with clause 2.2 (1) and (2)	
g) copies of all land use planning approvals	
h) written consent of the owner of excavation site	
i) any other information that the local government has required	
j) licence application fee of $.....	

SHIRE OF

- 8 FEB 2010

SERPENTINE JARRAHDALE

The applicant applies for a licence in respect of the proposed excavation site in accordance with and subject to the Shire of Serpentine-Jarrahdale Local Law relating to Extractive Industries.

Dated this 5 day of FEBRUARY 20 10

.....

Signature of applicant

See Attached Schedule

.....

Signature of owner of the land

.....

Signature of existing licensee

(if applicable)

Shire of Serpentine Jarrahdale

Landowner	Address	Lot	Plan/Diagram	Volume	Folio	Area (ha)
M. Furfaro, L Furfaro and A. Furfaro	Atkins Road, Keysbrook	6	D52395	1493	399	161.9221
M. Furfaro, L Furfaro and A. Furfaro	Atkins Road, Keysbrook	52	P739	1740	735	124.2198
M. Furfaro, L Furfaro and A. Furfaro	52 Atkins Road, Keysbrook	111	D94183	2117	847	40.0004
Olympia Resources Ltd	Level 4, 25 Walters, Osborne Park	112	D94183	2117	848	47.1354
M. Furfaro, L Furfaro and A. Furfaro	52 Atkins Road, Keysbrook	113	D94183	2117	849	42.5014
James Henry Charles Hill	c/ Post Office, Keysbrook	63	P739	1049	169	323.7485
M. Furfaro, L Furfaro and A. Furfaro	Atkins Road, Keysbrook	1	D8916	2094	330	202.1745

REGISTERED PROPRIETORS SIGNATURE SCHEDULE

SERPENTINE JARRAHDALE SHIRE

APPLICATION FOR APPROVAL TO COMMENCE DEVELOPMENT
&
APPLICATION FOR AN EXTRACTIVE INDUSTRY LICENSE

Lot No: 6
Street No: 762
Street Name: Westcott Road
Suburb: Keysbrook
Diagram / Plan: 52395
Certificate of Title Volume and Folio: 1493/399
Land Owner: Micheleangelo Furfaro, Lina Furfaro and Adriano Furfaro
Land Owner Address: Atkins Road, Keysbrook WA

Land Owner Signature _____ Date _____

Land Owner Signature _____ Date _____

Land Owner Signature _____ Date _____

090720 1906 SJ owner signature schedule

PLANNING SOLUTIONS

URBAN & REGIONAL PLANNING

APPLICATION FOR EXTRACTIVE INDUSTRIES LICENCE
PROPOSED EXTRACTIVE INDUSTRY
VARIOUS LOTS, KEYSBROOK

Job No: 1906
Date: February 2010

APPLICATION FOR EXTRACTIVE INDUSTRIES LICENCE
PROPOSED EXTRACTIVE INDUSTRY
VARIOUS LOTS, KEYSBROOK

Direct all inquiries to:

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PERTH WA 6000

ALL CORRESPONDENCE TO:
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PERTH BUSINESS CENTRE WA 6849

Phone: 08 9227 7970
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Web: www.planningsolutions.com

1.0 INTRODUCTION

Planning Solutions (Aust) Pty Ltd ('Planning Solutions') acts on behalf of Matilda Zircon Limited, the proponent of a proposed 'Industry Extractive' land use on various lots within the Keysbrook locality (Proposal).

The Proposal will facilitate the extraction of heavy mineral sands.

In addition to and connected with the Proposal, the proponent will be extracting heavy mineral sands from adjacent land within the Shire of Murray. All primary processing of heavy mineral sands other than screening of oversized extracted material will occur within the Shire of Murray. Extracted material will be transported to the processing plant by pipeline with surplus soil material returned to the subject site for backfilling by pipeline. Transportation of all processed mineral sand will occur from the site to the processing plant within the Shire of Murray.

Separate development approval will be obtained from the Shire of Murray.

Actual extraction of heavy mineral sands will commence once development approval for the primary processing functions of the Proposal is obtained from the Shire of Murray or an amended planning approval is obtained from the Shire of Serpentine Jarrahdale to locate processing plant within the subject site.

This report is provided in support of the Proponent's application for an Extrctive Industry Licence (Licence).

2.0 SITE DETAILS

2.1 LEGAL DESCRIPTION

The Proposal involves extraction of mineral sands from part of seven (7) lots (**subject site**) as depicted within Figure 1. The legal description of the subject lots is contained in Table 1 below.

Table 1 – Legal Description

Lot	Plan/Diagram	Volume	Folio	Area (ha)
6	D52395	1493	399	161.9221
52	P739	1740	735	124.2198
111	D94183	2117	847	40.0004
112	D94183	2117	848	47.1354
113	D94183	2117	849	42.5014
63	P739	1049	169	323.7485
1	D8916	2094	330	202.1745
			TOTAL	941.7021

Certificates of Title for the subject site are appended as *Appendix 1*.

The Proposed extraction area comprises a total of 401.6099 hectares (**excavation area**), which amounts to approximately 42.6% of the subject site. An area of 30 hectares will be progressively mined at any one time, in accordance with the Minister for the Environment; Youth Statement No. 810 (**Ministerial Approval**) (this includes any extraction within the Shire of Murray*)*. The maximum extraction area of 30ha is 3.2% of the subject site and 7.5% of the extractive area.

Figure 2 depicts the excavation area.

The Ministerial Approval is appended at Appendix 2.

2.2 REGIONAL CONTEXT

The subject site is located approximately:

(i) Fifty five (55) kilometres south of the Perth Central Business District;

(ii) Thirty two (32) kilometres south of the Armadale Regional Centre;

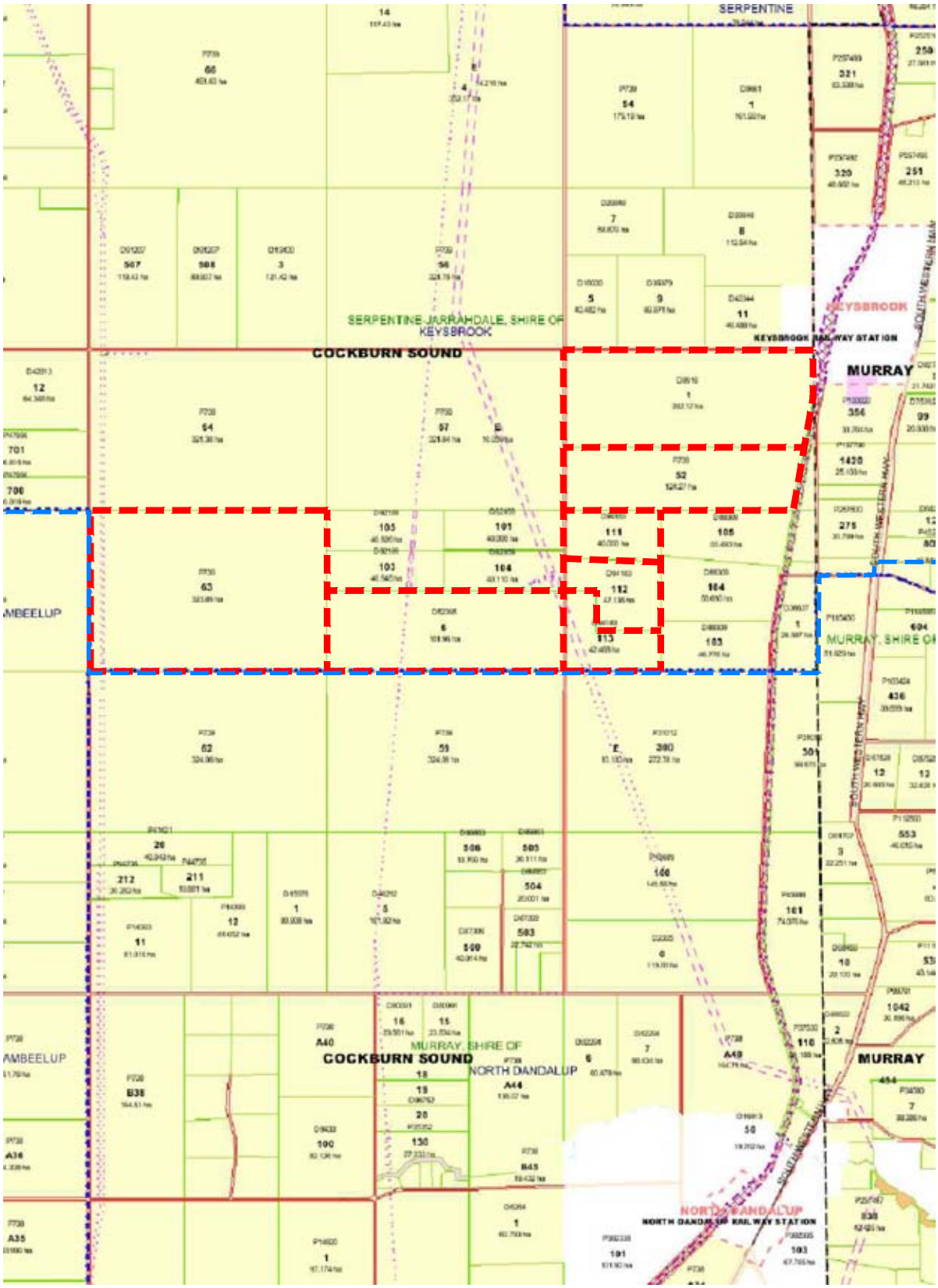
(iii) Thirty (30) kilometres south east of the Rockingham Regional Centre; and

(iv) Twenty (20) kilometres north east of the Mandurah Regional Centre.

The subject site is located in close proximity to both the South Western Highway and Forrest Highway, which connects the locality to the wider Perth Metropolitan Region, Peel Region, Greater Bunbury Region and the South West Region. South West Highway is reserved as 'Primary Regional Roads' under the MRS.

Figure 3 depicts the subject site in its Regional Context.

TOTAL LAND AREA WITHIN SHIRE OF SERPENTINE JARRAHDALE: 941.7021 ha
TOTAL EXCAVATION AREA WITHIN SHIRE OF SERPENTINE JARRAHDALE 401.6099 ha



SUBJECT SITE BOUNDARY
LOCAL GOVERNMENT BOUNDARY

FIGURE 1: LOCATION PLAN
LOTS 1, 6, 52, 63, 111-113
KEYSBROOK
WA

SCALE 1:50,000 @ A4
DATE 4 February 2010
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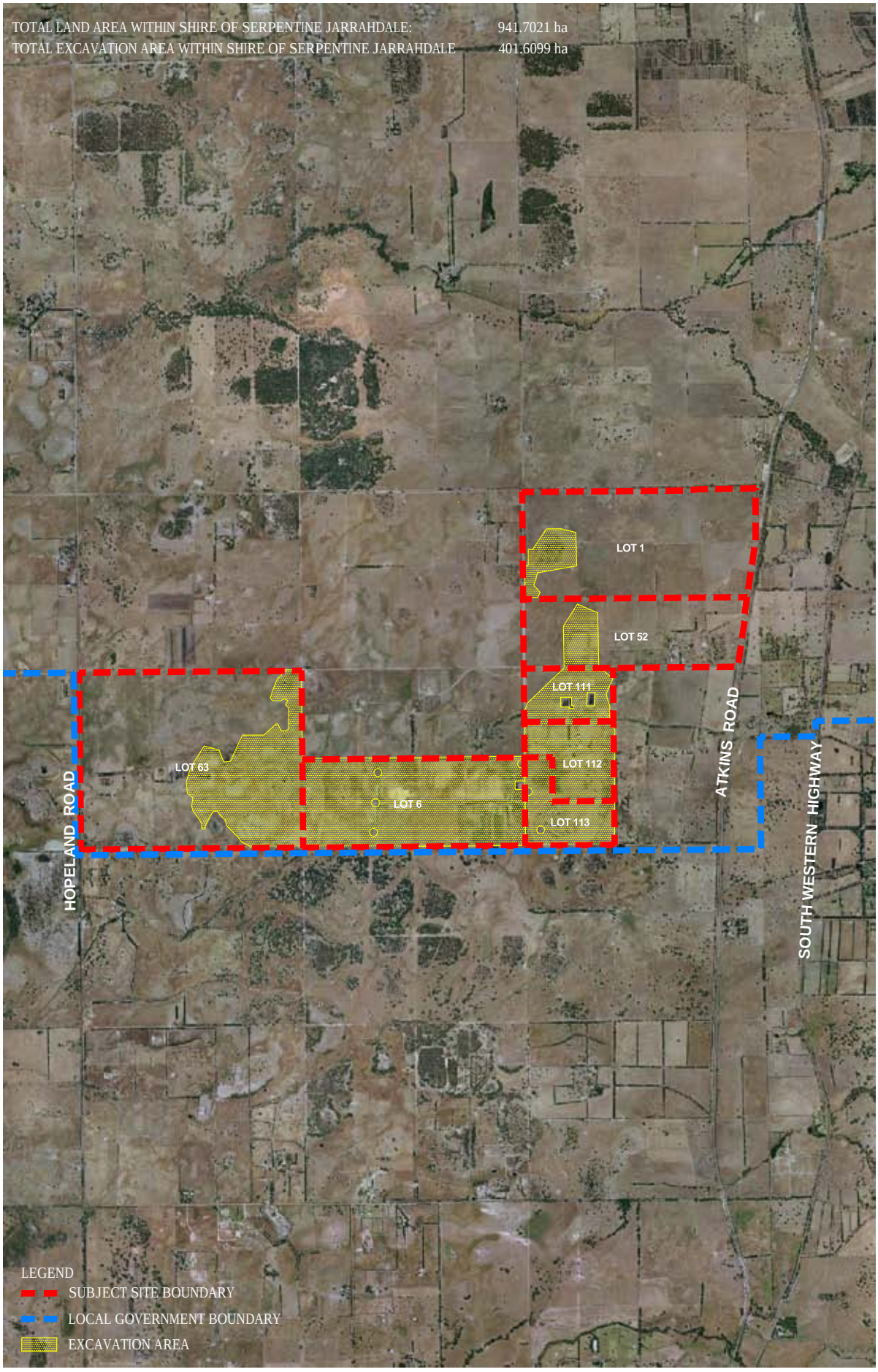

FIGURE 2: EXCAVATION AREA
LOTS 1, 6, 52, 63, 111-113
KEYSBROOK
WA

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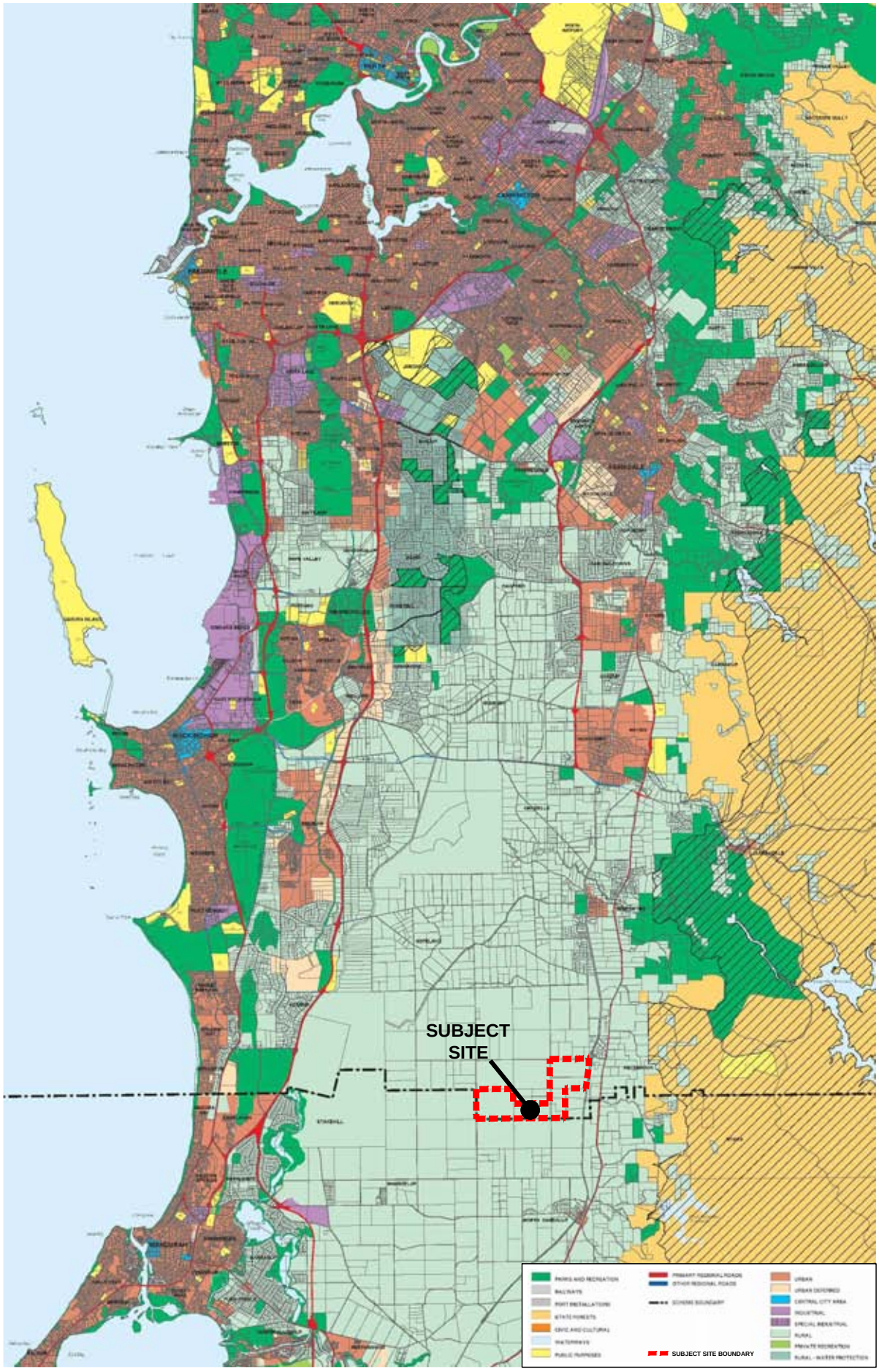

FIGURE 3: REGIONAL CONTEXT
LOTS 1, 6, 52, 63, 111-113
KEYSBROOK
WA

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DATE 4 February 2010
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2.3 LOCAL CONTEXT

The north-eastern boundary of the excavation area is located approximately 2.2 kilometres south-west of the Keysbrook town site and 5.5 kilometres north west of the North Dandalup town site. The subject site is located between Atkins Road to the east, the Shire of Serpentine Jarrahdale district boundary to the south, and Hopeland Road to the West
The subject site is located between the town sites of Keysbrook and North Dandalup.

Figure 4 depicts the subject site in its Local Context.

2.4 LAND USE

The subject site presently accommodates agricultural land use comprising annual pasture with limited stands of remnant native vegetation. The subject site is predominately used for beef cattle farming with some keeping of horses.

The vegetation across the subject site is sparse however where it is located it is predominately associated with residences, road reserves and watercourses that traverse the subject site. There is a larger area of vegetation located on Lot 1 that is associated with a slight rise in the elevation of the land.

There are a number of residential dwellings within the subject site. There are no residential dwellings within the planned excavation area and none planned for demolition. There are three occupied dwellings located within Lots 1 and 52. Of the three dwellings two are 2,000 metres from the excavation area. A newly constructed colorbond iron shed has been adapted as a dwelling within 250 metres of the excavation area on Lot 1. The Noise Management Plan required as part of the Ministerial Approval addresses any noise related concerns (Refer to section 3.5.2 of this report) associated with the dwellings.

The adjoining land holdings are also used for annual pasture agricultural purposes with associated outbuildings and structures.

There are five dwellings located on land adjacent to the subject site. The dwellings located on Lot 64 to the north-west of the subject site are over 1.2 kilometres from the excavation area. The closest of the three dwellings located on Lot 105, 101 and 104 is within approximately 300 metres of the excavation area. The Noise Management Plan required as part of the Ministerial Approval addresses the noise matters associated with these dwellings.

2.5 TOPOGRAPHY

The subject site is generally low lying with limited undulation. To the south-west of the subject site, at the lowest point the ground surface contour is 26m AHD which gently slops to a peak of 38m AHD some 3 kilometres directly east. The northern point of the subject site is a maximum of 40m AHD. Generally the subject site gently rises towards the east, closer to the escarpment.

Figure 5 depicts an aerial photograph of the subject site and immediate surrounds.

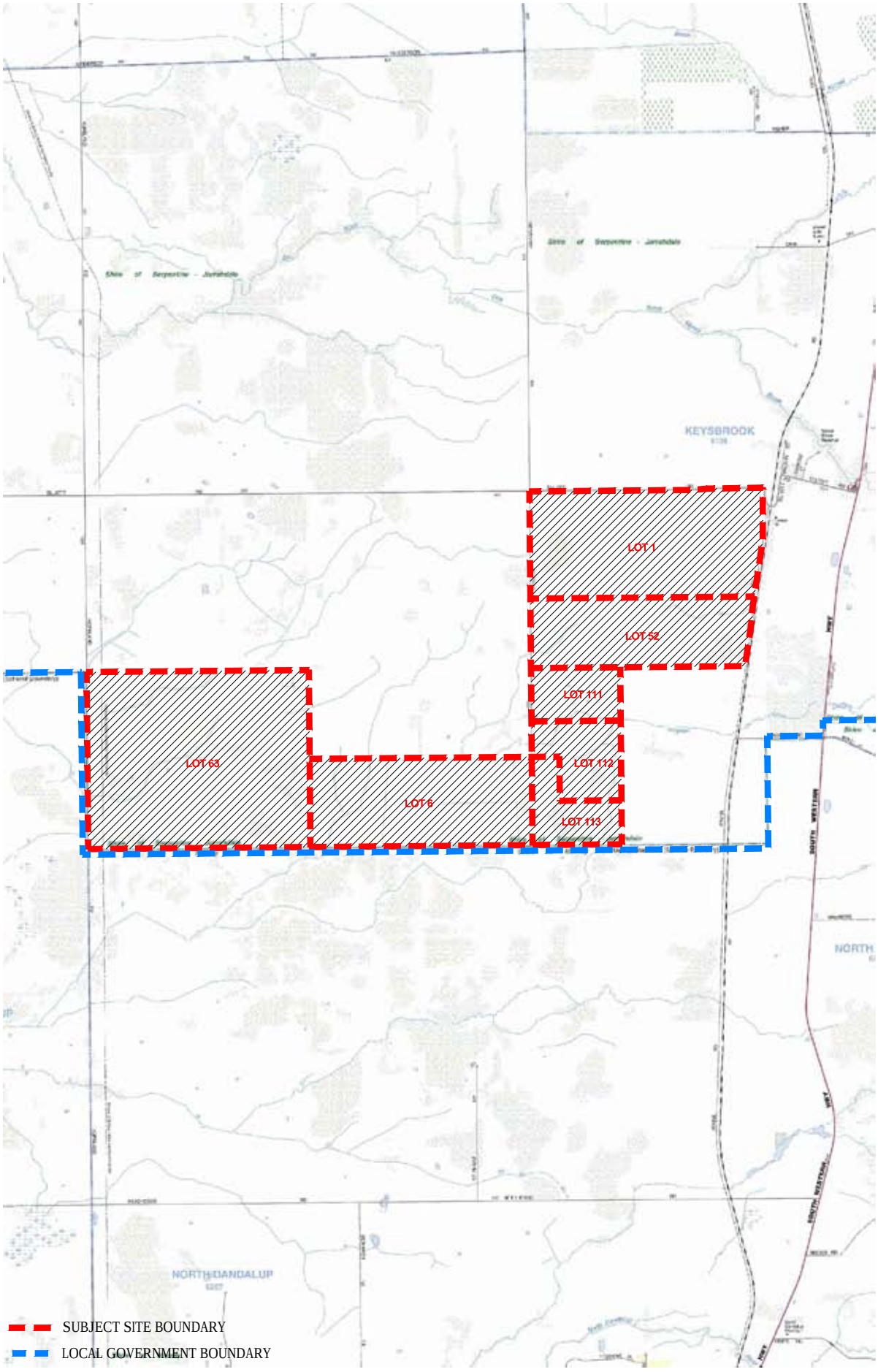

FIGURE 4: LOCAL CONTEXT
LOTS 1, 6, 52, 63, 111-113
KEYSBROOK
WA

SCALE	1:50,000 @ A4
DATE	4 February 2010
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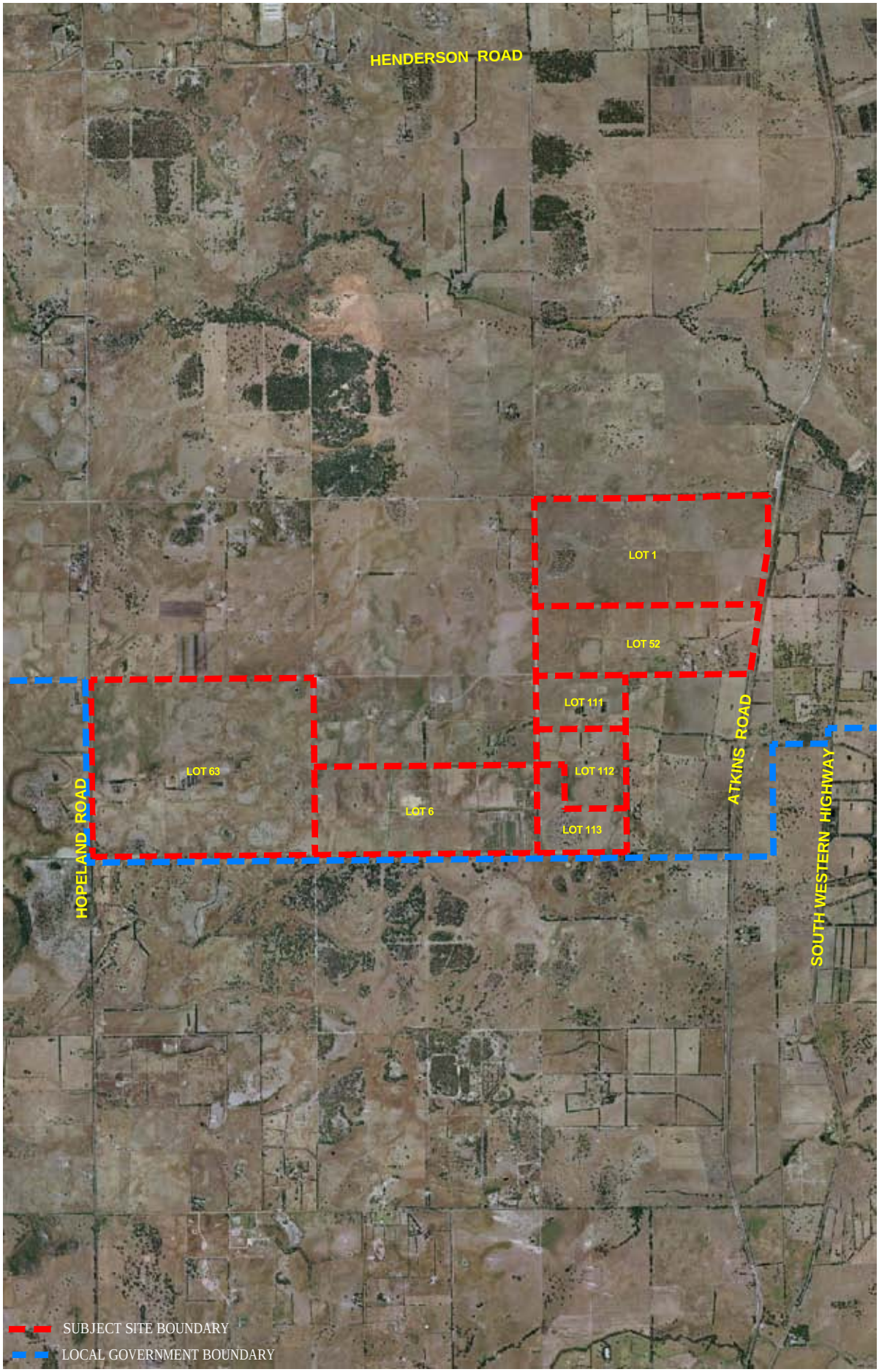

FIGURE 5: AERIAL PHOTOGRAPH
LOTS 1, 6, 52, 63, 111-113
KEYSBROOK
WA

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3.0 PROPOSED DEVELOPMENT

3.1 MINERALS

The Proposal involves the extraction of valuable heavy mineral sands from silica sand deposits across the subject site.

The valuable heavy mineral sands comprise zircon ($ZrSiO_4$), and the titanium bearing minerals ilmenite ($FeTiO_3$), leucoxene ($FeTiO_3$), and rutile (TiO_2). These minerals are used for a range of commercial purposes, as set out in Table 2.

Table 2 – Use of Minerals

Mineral	Common Use
Titanium	White titanium dioxide pigment has a very high opacity and is the basic ingredient of paint. It is also used in the manufacture of paper, plastics, cosmetics and sunscreen. Titanium metal is a light, strong metal, which is resistant to corrosion. It has many uses including aircraft fuselages, prosthetic limbs, pacemakers and sporting equipment.
Zircon	Zircon is used extensively in ceramics especially in the manufacture of ceramic tiles and porcelain ware. In addition zircon is used in high quality refractory and foundry work as well as in glass in televisions.

3.2 STAGING OF MINING

The mineral sands will be sequentially extracted from a series of locations across the subject site within the excavation area.

The extraction process requires the excavation of shallow pits to access the ore body. The average depth of the pits is 2 metres, and in areas that are slightly elevated approximately 4 metres. Due to ancient dune formations, the excavation pit is up to 6 metres in depth. Pits of this depth are limited across the site. Operations will likely advance at approximately 10 to 12 hectares per month based on an average excavation depth of 2 metres.

The rehabilitation process occurs in a continuous manner and therefore only an area of approximately 30 hectares remains under excavation at any one time. The excavation will occur across a number of pits to ensure that operations can be modified and relocated in accordance with the Noise Management Plan required as part of the Ministerial Approval.

The heavy mineral sand makes up an average of 2.7% of the mined material (approximately 1.23 m^3 for every 59 m^3 extracted) and therefore 97.3% of the material is returned to the excavation area for the rehabilitation purposes.

There are sufficient deposits of minerals sands to sustain the excavation process for up to approximately 10 years, inclusive of construction, decommissioning and rehabilitation activities.

The extraction will occur in a staged approach. Extraction will begin to the west of the subject site then progressively move to the east and then north. The time taken for the extraction and mining of ore, decommissioning of infrastructure and rehabilitation of the subject site in accordance with the Ministerial Approval will be 10 years.

3.3 MINING PROCESSES

Approximately 200 millimetres of topsoil will be progressively removed from the area about to be mined. The topsoil will only be removed immediately in front of the mine path. It will then either be directly returned to backfilled areas that are ready for final rehabilitation, if seasonal conditions are suitable, or stockpiled and stabilised to prevent wind erosion to be used in future seasonal rehabilitation.

The ore is excavated from the advancing edge of the pit via a front-end loader or excavator. There is no blasting involved in this extraction process.

The ore is transported via articulated dump trucks to a dump hopper and then conveyed to the screening unit. Screening removes material greater than two millimetres. Oversize material (approximately 10% of the ore body) is returned to the pit floor as backfill. The remaining sand (ore) is mixed with water and pumped as slurry to the primary processing plant. Approximately 70% of the slurry is water.

Both the dump hopper and screening unit are on the pit floor and therefore are only ever located within the extractive area.

The primary processing plant (located in the Shire of Murray) operates at 600 tonne per hour. Clay is removed from the slurry and fed into a thickener. Heavy mineral is separated from the sand using wet gravity spirals. Residue sand and thickened clay are pumped back into the excavation area as part of the rehabilitation process.

The heavy mineral concentrate is pumped into a stockpile to dry and then is transported to Bunbury for secondary processing and export.

Approximately 115,000 tonnes of heavy mineral concentrate will be produced per annum.

Figure 6 depicts the mining operation in diagrammatic form.

3.4 MINE INFRASTRUCTURE

The subject site provides for limited infrastructure on site as primary and secondary processing will occur off site. The primary processing with occur in the Shire of Murray. The initial processing is required to separate the 2.7% heavy mineral sands from the excavated ore. The majority of the infrastructure, that is processing, maintenance and administration infrastructure, will be located in the Shire of Murray and not subject to this approval. Only the screening unit and some pipelines will be located within the Shire of Serpentine-Jarrahdale for approximately 10 years.

3.4.1 Pipelines

Pipelines to transport water and slurry will traverse the subject site to connect the excavation area to the primary processing plant located in the Shire of Murray. These pipelines are relocated on a daily or weekly basis to facilitate the transportation of slurry to the primary processing plant.

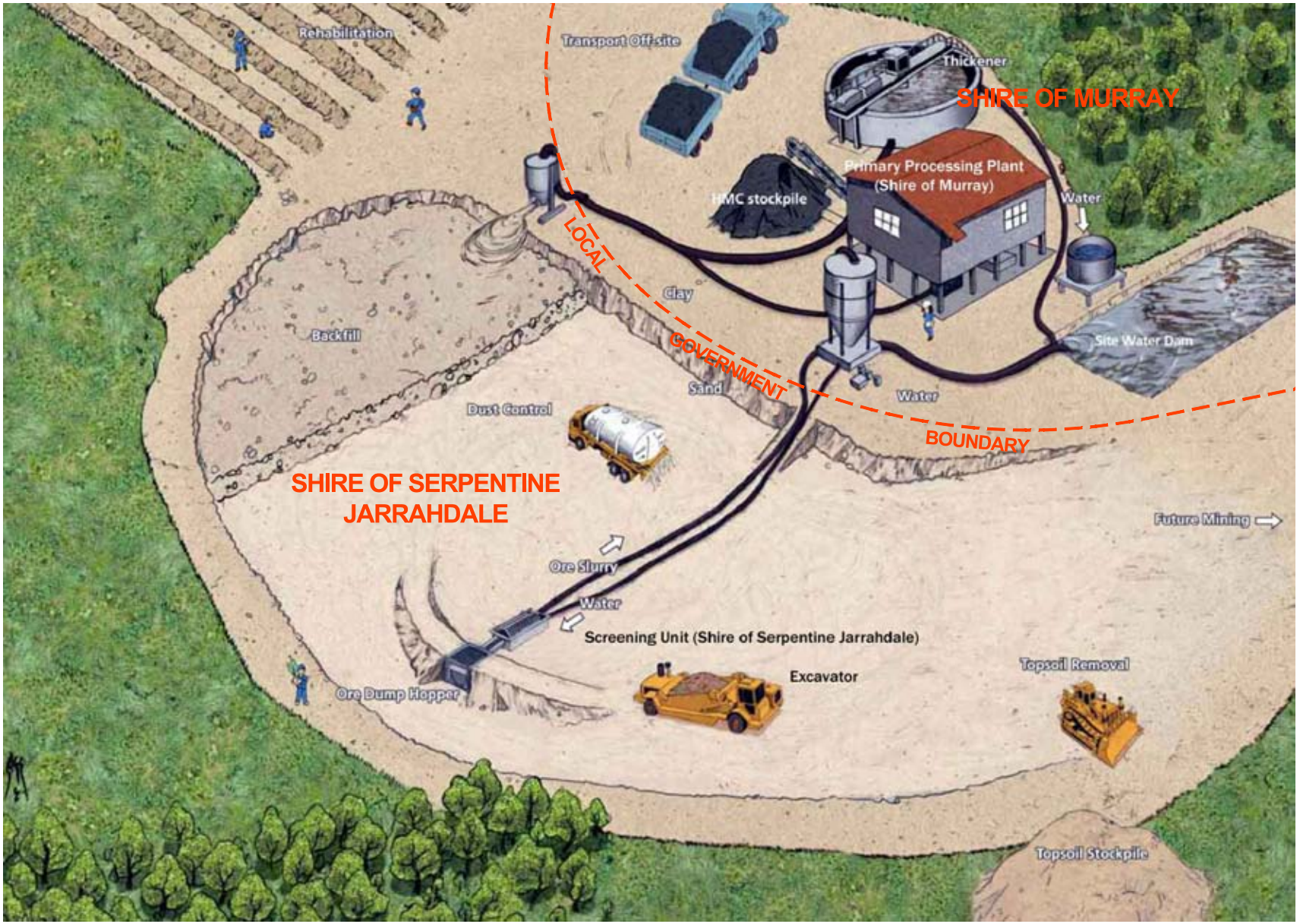

FIGURE 6:
MINING OPERATION IN DIAGRAMATIC FORM

LOTS 1, 6, 52, 63, 111-113
KEYSBROOK
WA

SCALE	1:NTS @ A4
DATE	4 February 2010
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3.4.2 Screening unit

The screening unit is located on the floor of the mine pit (within the excavation area). A dump hopper receives ore from articulated dump trucks and feeds ore onto a conveyor belt. The conveyor belt delivers ore from the hopper to either a rotating trommel screen or vibrating deck screen. The oversized material is returned back to the pit. The undersized material from the screen is fluidised and pumped directly to the primary processing plant (located in the Shire of Murray) for separation by gravity. The dump hopper, conveyor and screening unit are mounted on individual skid bases for frequent relocation within the excavation area.

The screening unit is estimated to be located in the Shire of Serpentine Jarrahdale for approximately 12 months while ore is being excavated from Lots 111, 52 and 1. The extraction of ore from Lot 63, 6, 112 and 113 will be screened in the Shire of Murray. All ore is direct fed i.e.; ore is excavated, transported, screened, processed (at the primary processing plant) and returned to the pit as backfill in a continuous process. Ore is not generally stockpiled. The time from excavation to return to pit is less than 1 hour.

3.4.3 Processing, Maintenance and Administration Infrastructure

The primary processing plant, workshop, office and below ground water storage facility, will be located in the Shire of Murray and is not the subject of this application.

Table 3 – Summary of infrastructure and machinery within the Shire of Serpentine Jarrahdale

Location of Infrastructure	Infrastructure and machinery
Pit infrastructure	Excavator or front end loader, articulated dump trucks, dump hopper, screening unit and pipelines

Development Plans are appended as *Appendix 3*.

3.5 MINE OPERATIONS

The impact of the proposed mining operations on the subject site and the surrounding locality will be limited due to the:

- Limited processing that will occur within the subject site, no primary or secondary processing, only screening will occur within the Shire of Serpentine Jarrahdale;
- Limited area of disruption relative to whole excavation area (7.5% of excavation area) at any one time being a maximum of 30 ha at any one time;
- Ease of extraction of the heavy mineral sand (gravity process);
- Top soil only being stripped and stockpiled when necessary in preparation for the extraction process;
- Limited number of staff required by the Proposal; and
- Limited infrastructure that will be required on the subject site, (screening unit).

3.5.1 Vehicle Parking and Traffic

The Proposal generates three types of traffic movements; commuter, heavy load and supplies. The majority of the transport movements will be on an informal internal movement network that does not affect local authority infrastructure or impact on the surrounding locality.

Commuter Traffic and Car Parking

The commuter traffic generated will be minimal. There will be a maximum of 35 staff operating facilities within the Proposal, accessing the site over a 24 hour period. It is not expected that more than 10 to 12 light vehicles will arrive at site for each day shift, these will mainly be employees and contractors. Access by this commuting workforce will be by light vehicles (class 1 in the Austroads classification system). There are a number of local roads that staff may use to access the subject site. It is not expected that any particular road will be significantly utilised above another except for road reserves within the Shire of Murray. The staff will initially arrive at the offices located at the primary processing plant area in the Shire of Murray. The majority of staff may access the site via the South Western Highway, Readheads Road and Atkins Road within the Shire of Murray. The staff will then utilise the internal road network to arrive at the excavation area.

Car parking requirements are limited to catering for a maximum of 35 workers on site at any one time. Car parking bays will be informally marked and co-located with the primary processing plant, offices and workshop. The car parking is located within the Shire of Murray and not subject to this approval.

The potential adverse affect on amenity relating to vehicle traffic is expected to be minimal. There are limited workers accessing the subject site which is located a short distance from South Western Highway (which is a dedicated freight route).

Heavy Vehicle Movements

Within the subject site the heavy vehicle movements are likely to be dispersed due to the excavation area moving throughout the life span of the project. Truck movements within the site correlate with the location of the screening unit where vehicle movements relate to excavation activity. Rarely there will be heavy vehicle movements between the screening unit and the Primary Processing Plant location as slurry will be piped from the screening unit to the primary processing point.

The heavy mineral concentrate (HMC) will be hauled by contractors on a daily basis to Bunbury for further processing. Each day eight (8) ore transport trucks will enter or leave the site. To achieve the maximum load per truck and minimise the number of truck movements from the site, either class 10 or 11 Austroads vehicles will be utilised. The planned haulage route is from the primary processing plant area in the Shire of Murray via the internal road network to Atkins Road, then south to Readheads Road and east to South Western Highway and on to Bunbury. None of the heavy haulage traffic movements on public roads will be within the Shire of Serpentine Jarrahdale.

Service Vehicles

There will be minimal supplies delivered to the subject site. The most regular delivery will be for diesel fuel, with one delivery by semi-trailer required per week. Other supplies will be delivered to the subject site via utilities or small trucks. It is expected this will be at a rate of one movement per day therefore having limited effect on the existing local road networks.

Deliveries of incidental equipment and spares will be minimal at less than one per day and again will unlikely to be within the Shire of Serpentine Jarrahdale apart from movement along South Western Highway.

Internal Traffic Movements

All other traffic movements are within an internal road network. The unmade portion of Westcott Road is to remain in its current state except for the occasional access across the road reserve for pipes and vehicles. The planned internal road network will be constructed adjacent and parallel to the unmade portion of Westcott Road and the trees within the road reserve will remain, providing screening. Some light traffic may access the subject site from time to time via the sealed and unsealed roads, however no heavy mining equipment will utilise public roads. Mining equipment will only cross over the unmade portion of Westcott where the road reserve dissects the planned excavation area between Lots 6 and 113 and Lots 59 and 300.

Figure 7 outlines the proposed transport route.

3.5.2 Noise

Noise associated with the Proposal will be managed in accordance with the requirements of the Ministerial Approval.

A comprehensive noise assessment of the Proposal has been undertaken as part of the Ministerial Approval process. That assessment addressed a range of noise sources associated with the operations of the extractive industry, including fixed infrastructure, mobile plant, ancillary equipment, construction activities, and on-site and associated off-site transportation.

Under the Ministerial Approval a Noise Management Plan is required with the following objectives:

- Identify potential noise impacts of the proposed operations;
- Outline the design and management strategies employed to avoid or minimise noise impacts; and
- Detail the monitoring and reporting requirements regarding noise impacts.

In order to achieve a noise level of 30 DB LA10 under the *Environmental Protection (Noise) Regulations 1987* (WA) the following distances from a sensitive use, such as residential dwellings, have generally been identified. Variables such as wind, time of day and ambient noise are also taken into consideration.

Table 4 – Distance from a sensitive use

Infrastructure	Distance
Booster Pumps	750 metres
Screening unit (Mobile Plant) and associated dump hopper and pumps	Varies in accordance with climatic conditions
Ancillary equipment	Localised and does not create a nuisance beyond the boundary of the subject site
Construction	Limited with most infrastructure transported to the subject site
Transport noise	Expected to be minor and all modelling indicated that the internal road network would result in levels less than the assigned noise levels.

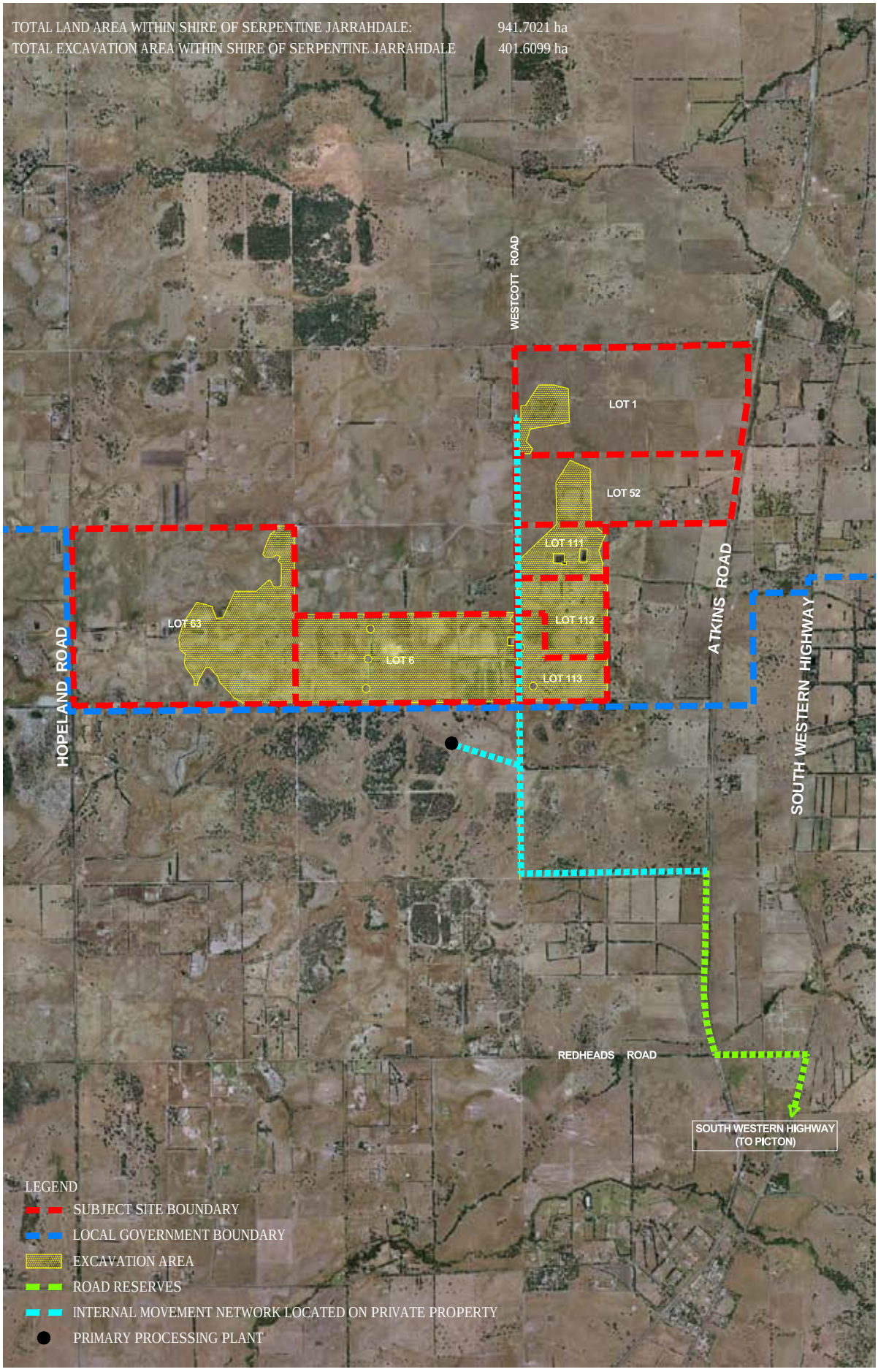

FIGURE 7: PROPOSED TRANSPORT ROUTE
LOTS 1, 6, 52, 63, 111-113
KEYSBROOK
WA

SCALE	1:50,000 @ A4
DATE	4 February 2010
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Noise from on site activities will be kept to within acceptable ranges. Given no blasting will occur on site there will be no significant noise impacts. In accordance with the Ministerial Approval there will be no mining operations undertaken within 1,500 metres of any building associated with a noise sensitive use at any noise sensitive premises outside of the hours of 7 am and 7 pm Monday to Saturday (or on public holidays) unless agreed to in writing with the relevant landowner and the occupant.

Vehicular and traffic noise has been extensively modelled as part of the Ministerial Approval process and projected noise levels are less than the assigned noise levels. Noise from vehicles transporting both supplies to site and processed ore off-site is expected to be minimal.

3.5.3 Blasting

No blasting is required under the Proposal.

3.5.4 Dust

Dust will be appropriately managed on site in accordance with the Ministerial Approval. Dust suppression measures will minimise any off-site impacts.

Under the Ministerial Approval an Air Quality and Dust Management Plan is required to address the following:

- Ensure dust emissions from activities undertaken in implementing the proposal do not cause ambient dust concentration levels outside the boundary of the proposal area;
- Identify measures to reduce dust; and
- Ensure emission do not harm or adversely affect the environmental values of the health, welfare and amenity of the people and land uses.

The requirement for an Air Quality and Dust Management Plan addresses the operational actions of the Proposal, including:

- Clearing of site
  - no clearing of vegetation and stripping top soil until necessary;
  - top soil stripping will be conducted in calm wind conditions; and
  - a dedicated water truck in operation during stripping.
- Loading of processed material;
  - spillages of processed material in the stockpile area will be collected at the end of each shift and returned to the main stockpile;
  - water carts or fixed sprinklers will be used to keep the work area damp; and
  - all loads of processed material are covered prior to leaving the stockpile area.
- General operations
  - water trucks available for dust suppression;
  - internal roads watered to minimise dust from vehicle movements;
  - clay spread on open areas to create an erosion resistance crust;
  - mulch and stubble will be used on open areas as temporary stabilisation;
  - topsoil stockpiles will be sown with appropriate cover crop (e.g. cereal rye or oats) or hydro mulched to form an erosion resistant surface; and
  - temporary ‘stubble’ crops will be established on refilled mine pits. Pasture will be re-established as soon as practicable after mining.
- Transportation
  - all loads will be covered prior to leaving the site.

There will be no adverse amenity impacts on the existing and future uses in the locality. In accordance with the Ministerial Approval the objective of the Air Quality and Dust Management Plan is to ensure that ambient dust concentration levels outside the subject site are not:

- Higher than 1 ug/m3 of Total Suspended Particulars as a 15 minute average; or
- Higher than 50 ug/m^3 of Particulate Matter smaller than 10 microns as a 24 hour average, in excess of five times per year.

3.5.5 Odour

There will be no odour emissions associated with the Proposal.

3.5.6 Flora

The subject area is predominantly annual pasture with some scattered remnant native vegetation consisting of stands of mature trees, with minimal or no understorey. The majority of remnant native vegetation is described as CEBM – scattered trees of Corymbia calophylla, Eucalyptus marginata subsp, marginate, Banksia species and Melaleuca preissiana, and is too degraded to infer a vegetation community type.

Two small vegetation communities within the subject site are described as CcKa – Corymbia calophylla over tall open shrub land of Kingia australis over closed grassland of weeds and BaBm, both are completely degraded.

The Ministerial Approval requires the Proponent to prepare a Rehabilitation Management Plan with the objectives of:

- Maintaining diversity of flora through the avoidance or management of adverse impacts; and
- Ensuring rehabilitation achieves a stable and functioning landform that is consistent with the surrounding landscape and other environmental values.

The Ministerial Approval requires the re-establishment of self-sustaining local provenance native vegetation for clearing under the Proposal, at a ratio of not less than 1.4:1 (1.4 hectares of revegetation per 1 hectare of vegetation cleared) and the re-establishment of functioning pasture. The Proposal will therefore increase the quality of the existing natural environment (which has been degraded by the existing 'rural' pursuits).

The local flora species selected for rehabilitation will enhance the biodiversity within the subject site by returning species that are at present poorly represented or absent.

An environmental corridor linkage will be established, running north-south. This corridor will connect to creek lines that run east-west. The majority of riparian vegetation on the subject site has been cleared. As part of the corridor linkage planting, both upland and lowland species will be replanted. Replanting will redress the current dominance of the existing upland community remnants.

Weed and dieback management issues are addressed under condition 9 of the Ministerial Approval, which requires the preparation and implementation of a Dieback and Weed Management Plan to ensure:

- Weeds are controlled in native revegetation areas to allow the establishment of planted trees; and
- Declared pest plant species are controlled in pasture areas.

3.5.7 Fauna

Fauna studies were undertaken as part of the environmental assessment process that culminated in the Ministerial Approval. Those studies considered:

- Short range endemic invertebrates;
- Systemic bird surveys, including for cockatoos;
- Reptiles, frogs and bats;
- Mammals such as the Quenda; and
- The habitat, trees and vegetation important for fauna particularly wildlife corridors and habitat linkages.

The studies (and the EPA Bulletin) concluded the fauna of the project area is depauperate due to extensive clearing, fragmentation and degradation of native vegetation. Notwithstanding, fauna still exists and is supported by the remnant vegetation. Those studies concluded that while the Proposal has the potential to impact on the fauna, the habitat for the fauna is already under threat.

The studies identified three species of black cockatoo, including the Red-tailed, Baudin and Carnaby cockatoos. No evidence of nesting was found on the subject site and minimal potential nesting hollows were identified. These species are also listed under the EPBC Act and the Proposal will be determined by the Federal Minister for the Environment under that statute by reference to the EPA Bulletin.

The Ministerial Approval concluded that the Proposal is environmentally acceptable subject to the undertaking of the previously identified rehabilitation and revegetation processes.

The report and recommendation to the Envirnment Protection Authority Bulletin 1269 (EPA Bulletin) is appended at *Appendix 4.*

3.6 WATER RESOURCES

3.6.1 Aquifers

The aquifers within the subject site include the Superficial Bassendean Sand Aquifer and the deeper Leederville Aquifer. Both of these will be impacted upon by the Proposal. The mineral deposit occurs within the Bassendean Sand Formation and process water will be sourced from the Leederville aquifer via production bores screened in the deeper member of the Leederville Aquifer.

Superficial Aquifer

The Superficial aquifer is an unconfined aquifer up to 15m deep and recharge to the superficial aquifer is from direct rainfall on the ground surface, and local stream runoff from ephemeral drainage networks flowing from the Darling Plateau. Recharge occurs mainly between May and September.

The Bassendean Sand Formation is generally unsaturated in summer and autumn, and partly saturated in winter and spring with water levels fluctuating approximately one metre annually. However, in some areas the Bassendean Sand Formation extends below the summer watertable and is partly to fully saturated all year.

To enable mining to occur during winter, water will be removed from the pit using drains and sumps. The groundwater will be temporarily lowered to the base of the Bassendean Sand Formation in and around individual mining cells.

Water levels will start recovering as mining moves to new cells, excavated cells are backfilled, and rainfall recharges the reconstituted aquifer. Backfill contains about 45% water.

The localised and temporary dewatering of the shallow aquifer will affect only those water-supply draw points that use the shallow aquifer, such as 'soaks' and 'drains' that probably extend to the base of the aquifer. The existing watering points on the subject site that draw from the superficial aquifer will not be required during the term of the mining operations.

Shallow watering points on properties adjoining the subject site may be affected by lowered water levels for one season. The proponent will identify watering points within 500 metres of proposed mining operations, commence water-level monitoring, and provide substitute water supplies at locations where existing supplies are significantly reduced as a result of mining/ dewatering.

The Department of Water (DoW) advice during the environmental assessment process (i.e. that culminated in the Ministerial Approval) concluded that the quality of water in the surrounding bores and the superficial aquifer should not be significantly affected as a result of groundwater abstraction.

Leederville Aquifer

The Leederville Aquifer is approximately 160 metres deep. Recharge to the Leederville Aquifer is from the Superficial aquifer.

Calculated water level drawdowns in the Leederville Aquifer indicate that the operation of any other Leederville bores in the area will not be significantly affected. By sinking the production bores into the lower (Marginiup) member of the aquifer, any impact on neighbouring bores, which are all screened into the upper (Wanneroo) member of the aquifer, is unlikely. A bore survey has been conducted and water level monitoring will be conducted. Remedial actions will be taken if any existing supply is significantly reduced as a result of mining.

The DoW advice during the environmental assessment process (i.e. that culminated in the Ministerial Approval) concluded that pumping the Leederville Aquifer would not have a significant impact on the Superficial Aquifer.

3.6.2 Watercourses

There are no *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (EPP wetlands) or Conservation Category wetlands within the subject site.

Modelling of water level changes within the Conservation Category wetland located closest to active mine pits was undertaken as part of the environmental assessment that culminated in the Ministerial Approval. Impacts of the Conservation Category wetland were determined to be acceptable as impacts are localised and temporary with recovery to pre-mining levels occurring soon after mining is completed.

There are a number of Resource Enhancement category wetlands in the excavation area. They are seasonal, they become inundated in winter and drying out during the summer months. These wetlands have been cleared and degraded for pasture and grazing purposes and will be further cleared for mining. The Ministerial Approval considered these Resource Enhancement category wetlands and concluded that the Proposal was acceptable.

Streams from the Darling Scarp and foothills flow through the subject site. Balgobin Brook is the major watercourse and Nambeelup Brook North Tributary is a medium watercourse and passes through the subject site. A significant length of the watercourse has been re-aligned to suit farm drainage requirements.

No clearing of vegetation or mining will occur:

- Within 20 metres of the banks of watercourses shown in Figure 9 of the PER [Public Environmental Review] document; or
- Within 100m of the boundary (sic) a conservation category wetland.

3.7 SERVICES

The Proposal does not require the provision of water supply, sewer or communications servicing.

3.7.1 Power

Power will be sourced from the State grid for the majority of the mine requirements. Once an order for power is placed, Western Power will decide on the route. Diesel powered portable generators may be utilised from time to time to power remote welding units or water pumps for maintenance requirements and on an as required basis.

3.7.2 Sewer

No permanent toilet facilities will be established away from the primary processing area. The toilet facilities will be located within the Shire of Murray and will be addressed as part of a comprehensive development application.

3.7.3 Water

Tanks for potable water storage will be required at the primary processing plant area associated with the office and workshop, located within the Shire of Murray. The process water is to be stored in below ground water storage facilities in the primary processing plant area.

3.8 INUNDATION OF FLOODWATERS

Due to the low laying nature of the subject site it is expected that in large storm events portions of the subject site a is expected to inundate due to floodwaters. The mining and excavation process identified will provide mining pits that will store excess water as required. Any water stored in times of heavy rainfall will be treated through the approved processes within the Water Management Plans required as part of the Ministerial Approval. Water will only be discharged via the Licensed Discharge Point in accordance with Environmental Protection Authority and Department of Water approvals.

There will be no disruption to the existing creeks flowing through the subject site and therefore flood events can be accommodated through the natural drainage systems.

The screening unit will be protected from potential flood events by drainage channels feeding into a sump which is emptied by a diesel water pump into storage pits or dams. Much of the machinery associated with screening unit is mobile and can be relocated simply in response to any flooding events.

3.9 LAND USE IMAPCTS

3.9.1 Groundwater

Issues relating to groundwater have been comprehensively addressed through the environmental assessment process that culminated in the Ministerial Approval. The Proposal will not adversely affect groundwater within the subject site or surrounding area.

3.9.2 Native Terrestrial Vegetation

Issues relating to native terrestrial vegetation have been comprehensively addressed through the environmental assessment process that generated the Ministerial Approval and will culminate in a determination by the Federal Minister under the EPBCA Act. The Proposal will not adversely affect native terrestrial vegetation within the subject site or the surrounding area.

3.9.3 Native Terrestrial Fauna

Issues relating to terrestrial fauna have been comprehensively addressed through the environmental assessment process that generated the Ministerial Approval and will culminate in a determination by the Federal Minister under the EPBC Act. The Proposal will not adversely affect native terrestrial fauna within the subject site or the surrounding area.

3.9.4 Wetlands

Issues relating to wetlands have been comprehensively addressed through the environmental process that culminated in the Ministerial Approval. The Proposal will not adversely affect any wetland.

3.9.5 Rehabilitation

Issues relating to rehabilitation have been comprehensively addressed through the environmental assessment process that generated the Ministerial Approval and will culminate in a determination by the Federal Minister under the EPBC Act. The Proposal involves on-site rehabilitation and does not generate a requirement for further rehabilitation within the surrounding area.

3.9.6 Aboriginal Heritage Significance

The subject site contains no Aboriginal sites and will not adversely impact on any matter of Aboriginal Heritage Significance.

3.9.7 Health Impacts

There will be no health or mental health impacts on local residents, visitors to the subject site or surrounding area or those involved in undertaking the Proposal, including exposure to airborne contaminants, radiation and dust.

The Proposal will not unreasonably interfere with the health, welfare, convenience, comfort or amenity of people on the subject site or within the surrounding area.

The Proposal does not have the potential for biophysical impacts to significantly and adversely cause change social surroundings, water contamination, mosquito breeding or adversely affect end-product food production. The Proposal will not have a cumulative health impact on local residents, visitors to the subject site or surrounding area or those involved in undertaking the Proposal.

3.9.8 Transport

Public Road Use

All heavy haulage is to occur on public roads within the Shire of Murray. Staff or maintenance vehicles may access the site via public roads within the Shire of Serpentine Jarrahdale, however unlikely as the administrative centre is located within the Shire of Murray (Refer to section 3.5.1 of this report).

Commuter Workforce

Workforce vehicles will be light vehicles and there are several road options to access the office area (in the Shire of Murray) depending on where the workers live.

Given these numerous route options, it is highly unlikely that the additional number of vehicles will be concentrated on any one road within the Shire of Serpentine Jarrahdale except for South Western Highway. Accordingly the overall impact of this traffic will be minimal (Refer to section 3.5.1 of this report).

Noise from Trucks

Lloyd Acoustics modelled the noise impact from trucks on the internal road network. It demonstrates that noise levels are less than the assigned noise levels and therefore are acceptable.

3.9.9 Amenity

Amenity concerns that relate to environmental issues were addressed in the comprehensive environmental approval process that culminated in the Ministerial Approval. Those issues will not individually or collectively adversely impact on the amenity of the locality.

No amenity concerns arise as a consequence of the proposed land use. Land use matters are addressed at section 3.9 of this report.

No amenity concerns arise as a consequence of the visual appearance of the Proposal and the existing visual amenity will be preserved. Visual appearance and landscape issues can be appropriately dealt with and are addressed at section 3.10 of this report.

3.9.10 Economic Impacts

Within ten years the subject site will have been rehabilitated to a level that provides for greater native vegetation, with a more diverse range of species than is currently provided for. The tapestry of the landscape will be preserved, if not enhanced.

The feasibility of future alternative land uses, both within and in proximity to the subject site is improved by the Proposal. Within ten years there will be greater environmental diversity, thus increasing the local landscape amenity of the area. Through the rehabilitation process the pasture will be reinstated thus not detrimentally affecting the existing grazing land uses.

There will be a number of positive impacts on the local economy. This will range from employment opportunities to potential expansion of local businesses:

- There is potential for staff to be sourced from the local area, the types of jobs on offer will require a range of expertise and experience ranging from manual labour to mechanical. This provides the local community with employment opportunities that were not originally provided for;
- Ffrom time to time there will be a need for the Proponent to purchase supplies and parts from local businesses thus further contributing to the local economy;
- There exists potential for discretionary spending by staff to occur within businesses in the area; and
- The Proposal will diversify the economic base of the locality and the region.

3.9.11 Agricultural Land Use

The Proposal will not diminish the capability for agricultural activities on surrounding and abutting land continuing into the future, as the excavation area that is under mining at any one time is significantly smaller than both the total area to be mined (excavation area) and the subject site.

While development is for ten years within the Shire of Serpentine Jarrahdale the excavation area will only be up to a maximum of 30 ha at any one time, and with management of livestock and appropriate planning of crops some farming activities can still occur within the subject site. Temporary fencing will be regularly erected and relocated to minimise the land utilised by mining operations and maximise land available for farming.

It is expected that a number of the 10 years will be set aside for the establishment of rehabilitation and decommissioning where farming practices can still occur. It is expected that rehabilitated land will be made available to the landowner after two growing seasons.

3.10 VISUAL IMPACT

The Western Australian Planning Commission released the 'Visual Landscape Planning in Western Australia – A manual for evaluation, assessment, sitting and design' (Landscape Manual) in 2007 as an acknowledgement of the public's interest in the preservation of landscapes and the need to integrate the evaluation of the landscape into the planning process.
The Landscape Manual:

- Identifies that over time landscapes change through human and natural intervention; and
- Recognises that individual landscapes differ and that rural landscapes involve a highly modified, although sparsely populated context.

It is the management of the change to landscape that is the most critical issue, since the receptiveness of the public to change is based on a range of values.

The Manual identifies a process to resolve conflicts between environment, cultural and economic return considerations. The visual landscape evaluation model comprises the following steps:

- Step 1: Define the scope of the evaluation and set the context;
- Step 2: Describe the visual landscape character;
- Step 3: Evaluate the way the visual landscape character is viewed, experienced and valued;
- Step 4: Develop strategies for managing visual landscape character; and
- Step 5: Implementation strategies through the planning system.

Only steps 1 to 4 are relevant in assessing the Application.

3.10.1 Visual Landscape Evaluation

Step 1 - Define the scope of the evaluation and set the context.

The study area is the extractive area as identified earlier within this development application (Refer to section 2.1). The basic geographical features have been described within the section 2.4 and 2.5 of this report.

Step 2 - Describe the visual landscape character.

The visual landscape within the subject site and surrounding the subject site is predominately dominated by a natural landscape that has been heavily modified by human activity. There are scattered trees, out buildings associated with farming activities and a limited number of dwellings.

The subject site is dominated by large paddocks that have predominately been used for grazing purposes. These paddocks are characterised by open expanses of pasture and stands of degraded native vegetation, including a large number of die back affected stands. The vegetation on most properties within the subject site is limited, with most large stands of vegetation located predominately along the road reserves, watercourses and around dwellings. The open low-lying paddocks are broken with sparsely vegetated drainage channels. There is one area that is more heavily vegetated on Lot 1, covering approximately 16.6 ha, located on a slightly raised area. Areas demonstrating this clustering of vegetation are limited across the subject site.

The remaining existing vegetation tends to exist in linear patterns, such as along watercourses, public road reserves, and lot boundaries. There is a small clustering of exotic and native species around dwellings.

The watercourses are not a predominate feature across the landscape due to the diminished size of the tributaries and the lack of existing vegetation, this is predominately due to clearing associated with agricultural activities in the past. Even though the watercourses are visually diminished they have been protected through the Ministerial Approval.

To the east of the site is the railway line that connects Perth to Pinjarrah.

Step 3 - Evaluate the way the visual landscape character is viewed, experienced and valued.

The area is low lying and therefore is predominately viewed at eye level from the surrounding road network. There are no significant features of the subject site that would be viewed from a distance and therefore there are limited elements that would draw the eye towards the subject site.

The key views are selected based on the significance of the location to the local and greater community and the number of people that are able to gain access to that view.

The key views are determined to be:

- To the west from the South Western Highway;
- To the south from Keysbrook Town Site;
- To the west from the Escarpment; and
- From the local roads into the subject site, namely Westcott Road, Atkins Road and Elliot Road.

The South Western Highway is a major thoroughfare through the Shire of Serpentine Jarrahdale. It not only provides the local community with an integrated movement network but also provides visitors with access to the Shire. As the Proposal is at the entrance to the Shire of Serpentine Jarrahdale the visual appearance of the Proposal is important to the local community. There are motorists that will potentially view the excavation area while travelling along the highway.

The number of people that are able to view the excavation area from the town site is potentially greater than the number viewing it from landholdings adjacent to the subject site. With a greater number of people potentially affected, the view from the Keysbrook town site is considered to be key view.

The potential for a greater portion of the excavation area to be seen from the elevated position of the escarpment makes it a key view. Both the local community and the visitors to the area may view the excavation area from this location.

The local road network is also a key viewing opportunity. The local roads are the closest that the community can get to view the excavation area. The number of potential viewers is however dramatically reduced compared to the South Western Highway, as the local roads are not high frequent thoroughfares. It was evident during the site visit that Hopeland and Atkins Road had a greater number of vehicles, predominately heavy haulage vehicles for industrial and farming activities, that could view the excavation area than Westcott Road and Elliot Road.

Those experiencing the key views will be moving through the subject site in a number of ways that will affect the experience.

Predominantly the views from the South Western Highway will be experienced at high speeds in a motor vehicle. The view of the subject site viewed from the South Western Highway is intermittent with vegetation and the railway blocking views of the excavation area. The site visit confirmed that it could be difficult to even identify the railway that is between the subject site and South Western Highway. The vegetation screens much of the view of the trains on the freight line and therefore also screens the excavation site.

The view from the Keysbrook town site, that is the Keysbrook general store on the corner of South Western Highway and Elliot Road is completely obstructed by vegetation. No portion of the excavation area would be seen.

The potential view of the excavation area from the escarpment was viewed from Boyd Road. The ability to see the subject site was intermittent due to heavy vegetation (trees and shrubs) within the road reserve. There was no formal point along Boyd Road (to the west of the escarpment) that a motorist could park their vehicle to experience the view. The occasional break in the vegetation with the road reverse, allowed for glimpses of the excavation area when travelling in a motor vehicle. The 30 ha area that will be progressively revegetated is some 3.6 kilometres away and would be expected to blend with the existing cleared nature of the paddocks.

The potential view of the extractive area from the local roads is more detailed. While the viewer is able to distinguish the excavation area more clearly it is expected to be viewed by less people. The view of the excavation area would most visible from Westcott Road (based on distance from the excavation area) however that road only services the lots that are subject to the Proposal and one additional lot resulting in reduced traffic levels. In addition the lot sizes are large and therefore there are times throughout the life of the mine the distance between the extractive area and the road reserve will be up to 800m. The southern boundary of the subject site abuts adjoining properties and therefore there is no road access along that boundary further restricting access to the site and limiting potential views.

In addition, the portion of the view that will be modified will be reduced depending on a number of factors:

- The circumstances in which the viewer is attempting to view the excavation area;
- The angle the excavation area is viewed at;
- The distance the viewer is from the excavation area;
- The objects that are between the viewer and the excavation area; and
- Speed the viewer is travelling at, (i.e. walking, cycling, riding, driving or flying); and
- The area that is currently being mined;

- The maturity of the rehabilitation;
- The location of the clearing of exiting vegetation within the subject site (i.e. 40m from road reserve not to be cleared as per extractive industries licence);
- The typography of the land;
- The weather on the day of viewing the extractive area; and
- The time of year (i.e. green pasture in winter will reduce the visual impact of a rehabilitated extractive area).

All these factors combine to reduce the visual appearance of the extractive area when viewed from the escarpment, South Western Highway and the Keysbrook Town site. It is important to note the visual characteristic of the area is a highly modified landscape. The rural activities have resulted in the large scale clearing of land. The mining activities are of a similar nature (clearing of land) however with a commitment and requirement to replace the vegetation which is not provided for by the current land use.

Step 4 - Develop strategies for managing visual landscape character.

There are a number of visual management outcomes that have resulted from the Management Plans required as part of the Ministerial Approval.

The visual impact on the Proposal area will either be temporary or minimal, as revegetation and planting of pasture will occur sequentially in the shadow of the excavation. Large open areas of existing degraded land will be temporarily modified through the excavation process. Pasture and trees will be cleared to allow for extraction to occur. The largest single area of trees is located on Lot 1. Some of these trees will be removed during excavation however rehabilitation will occur at a rate of 1.4:1.

The Proposal includes a number of measures that will minimise the visual impact of mining activities, such as:

- Nno existing native vegetation will be cleared within 40m of any formed road reserve abutting the subject site as per the extractive industry licence provisions, except where access to the road reserve is required;
- Sequential rehabilitation of the excavation area;
- An extraction area that is only 30 ha, at any one time;
- Limiting the clearing of vegetation to 6 months prior to when the excavation of the area is planned thus reducing the area that is disrupted;
- Storing and reusing the top soil to encourage growth of pastures;
- Revegetation at a ratio of 1.4:1.0; and
- Preservation of vegetation within 20m of the major and medium watercourses.

Where possible fixed infrastructure will be located in a way that existing and rehabilitation vegetation will screen the view of the motorists along South Western Highway, escarpment and the town site. Where appropriate the choice of materials and colours will compliment the existing rural character of the surrounding area and blend with the tones of the landscape.

The rehabilitation process will not only address the environmental conditions applied through the Ministerial Approval but will also take into consideration the exiting character of the landscape.

The mine is temporary and the land will be returned to the landowners at its pre-mined condition, that is the landowner will be able to continue to farm the land. Part of the rehabilitation process will need to ensure areas to be protected do not adversely affect the ability of landowners to continue with their agricultural land practices.

The proposed revegetation will continue to reflect the character of the vegetation that currently dominates the landscape, linear plantings of vegetation along road reserves and watercourses will act as screens and windbreaks and blend with the existing vegetation.

Agricultural land use

The Proposal will not diminish the capability for agricultural activities on surrounding and abutting land continuing into the future, as the excavation area that is under mining at any one time is significantly smaller than both the total area to be mined (excavation area) and the subject site.

While development is for ten years within the Shire of Serpentine Jarrahdale the excavation area will only be up to a maximum of 30 ha at any one time, and with management of livestock and appropriate planning of crops some farming activities can still occur within the subject site. Temporary fencing will be regularly erected and relocated to minimise the land utilised by mining operations and maximise land available for farming.

It is expected that a number of the 10 years will be set aside for the establishment of rehabilitation and decommissioning where farming practices can still occur. It is expected that rehabilitated land will be made available to the landowner after two growing seasons.

4.0 EXTRACTIVE INDUSTRIES LICENCE

The following details how the Proposal address the requirements of the Extractive Industries Licence.

Table 4 – Provisions of the Extrative Industires Licence

Application for Extractive Industry Licence – Clause 2.3 Requirements		
Clause	Requirement	Provided
2.3 (1)(a)	3 copies of a plan of the excavation site to a scale of between 1:500 and 1:2000 showing -	
...(i)	The existing and proposed land contours based on the Australian Height Datum and plotted at 1 metre contour intervals;	Refer to figure 2.
...(ii)	The land on which the excavation site is to be located;	Refer to section 2.1 and figure 1.
...(iii)	The external surface dimensions of the land;	Refer to section 2.1 and figure 1.
...(iv)	The location and depth of the existing and proposed excavation of the land;	Refer to section 2.1 and 3.2. Excavation area: 401.6099 ha Depth of excavation area: 2 to 6 metres.
...(v)	The location of existing and proposed thoroughfares or other means of vehicle access to and egress from the land and to public thoroughfares in the vicinity of the land;	Refer to section 3.5.1 and figure 7.
...(vi)	The location of buildings, treatment plant, tanks and other imporvemenrs and developments existing on, approved for or proposed in respect of the land;	Refer to section 3.4 and figure 6.
...(vii)	The location of existing power lines, telephone cables and any associated poles or pylons, sewers, pipelines, reserves, bridges, railway lines and registered grants of easement or other encumbrances over, on, under or adjacent to or in the vicinity of the land;	The existing powerlines have been removed from the excavation area. Refer to figure 2.
...(viii)	The location of all existing dams, watercourses, drains or sumps on or adjacent to the land;	Refer to figure 2.
...(ix)	The location and description of existing and proposed fences, gates and warning signs around the land; and	The location and description of gates and warning signs will be erected in accordance with the *Mines Safety and Inspection Act.*
...(x)	The location of the areas proposed to be used for stockpiling excavated material, treated material, overburden and soil storage on the land and elsewhere;	The stockpiling of excavated material will be within the Shire of Murray and not subject to this application.
2.3(1)(b)	3 copies of a works and excavation programme containing -	
...(i)	The nature and estimated duration of the proposed excavation for which the licence is applied;	Refer to section 3.2 of this report.
...(ii)	The stages and the timing of the stages in which it is proposed to carry out the excavation;	Refer to section 3.2 of this report.
...(iii)	Details of the methods to be employed in the proposed excavation and a description of any on-site processing works;	Refer to section 3.3 of this report.

...(iv)	Details of the depth and extent of the existing and proposed excavation of the site;	Refer to section 2.1 and 3.2. Excavation area: 401.6099 ha Depth of excavation area: 2 to 6 metres.
...(v)	An estimate of the depth of and description of the nature and quantity of the overburden to be removed;	Only 2.7% of the material mined is removed from site. Refer to section 3.2 of this report.
...(vi)	A description of the methods by which existing vegetation is to be cleared and topsoil and overburden removed or stockpiled;	Vegeation to be removed by mechanical means. Top soil will be stockpiled to be reused in the rehabilitation process. Stockpiles will be associated with the excavation area.
...(vii)	A description of the means of access to the excavation site and the types of thoroughfares to be constructed;	Refer to section 3.5.1 of this report.
...(viii)	Details of the proposed number and size of trucks entering and leaving the site each day and the route or routes to be taken by those vehicles;	Refer to section 3.5.1 of this report.
...(ix)	A description of any proposed buildings, treatment plant, tanks and other improvements;	Refer to section 3.4 of this report.
...(x)	Details of drainage conditions applicable to the land and methods by which the excavation site is to be kept drained;	Refer to section 3.8 of this report.
...(xi)	A description of the measures to be taken to minimise dust nuisance, erosion, watercourse siltation and dangers to the general public;	Refer to the following sections for a range of matters: • Section 3.5.2 Noise • Section 3.5.3 Blasting • Section 3.5.4 Dust • Section 3.5.5 Odour • Section 3.5.6 Flora • Section 3.5.7 Fauna • Section 3.6 Water Resources • Section 3.9 Visual amenity
...(xii)	A description of the measures to be taken to comply with the Environmental Protection (Noise) Regulations 1997;	Refer to the Miniterial Approval appended at appendix 2.
...(xiii)	A description of the existing site environment and a report on the anticipated effect that the proposed excavation will have on the environment in the vicinity of the land;	Refer to section 2.4 of this report for site environment. Refer to the following sections for impacts on environment in the vicinity of the land: • Section 3.5.4 Dust • Section 3.5.6 Flora • Section 3.5.7 Fauna • Section 3.6 Water Resources • Section 3.9 Land Use Impacts • Section 3.10 Visual amenity
...(xiv)	Details of the nature of existing vegetation, shrubs and trees and a description of measures to be taken to minimise the destruction of existing vegetation; and	Refer to section 3.5.6 of this report.
...(xv)	A description of the measures to be taken in screening the excavation site, or otherwise minimising adverse visual impacts, from nearby thoroughfares or other areas;	Refer to section 3.10 of this report.

2.3(1)(c)	3 copies of a rehabilitation and decommissioning programme indicating -	
...(i)	The objective of the programme, having due regard to the nature of the surrounding area and the proposed end-use of the excavation site;	The Ministerial Approval requires the preparation of a Rehabilitation Management Plan to the requirements of the CEO of the Environmental Protection Authority. The objectives of the programme will be comprehensively dealt with through the environmental assessment process.
...(ii)	Whether restoration and reinsttment of the excavation site is to be undertaken progressively or upon completion of excavation operations;	Progressively in accordance with the Ministerial Approval.
...(iii)	How any face is to be made safe and batters sloped;	The excavation area will not result in pits the mineral sands is removed from just below the top soil.
...(iv)	The method by which topsoil is to be replaced and revegetated;	The Ministerial Approval requires the preparation of a Rehabilitation Management Plan to the requirements of the CEO of the Environmental Protection Authority. The objectives of the programme will be comprehensively dealt with through the environmental assessment process.
...(v)	The numbers and types of trees and shrubs to tbe planted and other landscaping featurtes to be developed	In accordance with the rehabilitation management plan included in the Ministerial Approval.
...(vi)	how rehabilitated areas are to be maintained; and	In accordance with the rehabilitation management plan included in the Ministerial Approval.
...(vii)	The programme for the removal of buildings, plant waste and final site clean up.	There will be no perment structures that are to be removed from the excavation area. All structures associated with processing are located in the Shire of Murray and are not subject to this approval.
2.3(1)(g)	Copies of all land use planning approvals required under any planning legislation;	To be provided on approval.
2.3(1)(h)	The consent in writing to the application from the owner of the excavation site;	Refer to Appendix 1.

5.0 CONCLUSION

It is in the public interest that the Proposal should be approved in recognition of the readily available deposit of heavy mineral sands within the subject site. The application should be approved for the following reasons:

1. The proposed 'Extractive Industry' use is consistent with the provisions of the by-laws;
2. The Proposal is consistent with all relevant State Planning Policies;
    a. Statement of Planning Policy No. 1 – State Planning Framework;
    b. Statement of Planning Policy No. 2 - Environment and Natural Resources Policy;
    c. Statement of Planning Policy No. 2 .1 – The Peel-Harvey Coastal Plain Catchment;
    d. Statement of Planning Policy No. 2 .5 – Agriculture and Rural Land Use Planning; and
    e. Statement of Planning Policy No. 4.1 – State Industrial Buffer Policy.
3. The Proposal is compatible with the existing landscape characteristics and represents an appropriate and justifiable change to the existing landscape having regard to the Western Australian Planning Commission's Visual Landscape Planning in Western Australia a manual for Evaluation, assessment, sitting and design;
4. The Proposal has been approved by the Minister for the Environment under the Environmental Protection Act 1986 and consequently will not have an inappropriate impact on the environment;
5. The proposed development is temporary in nature and will not adversely impact on the surrounding environment, community or amenity of the locality; and
6. The native vegetation on subject site will be improved as a consequence of the Proposal.