

ENVIRONMENTAL MANAGEMENT PLAN

LOTS 4 AND 5, LUDLOW ROAD, MYALUP SHIRE OF HARVEY

PREPARED FOR

B & J CATALANO PTY LTD



BY



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Appendix 2:	Water Management Plan See 'Additional Information Report March 2020' for latest version
Appendix 3:	Vegetation Values Survey Report 2018
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Appendix 5:	Weed Management Plan See 'Additional Information Report March 2020' for latest version
Appendix 6:	AHIS Aboriginal Heritage Site Search Report

1. INTRODUCTION

The purpose of this report is to provide all the necessary information required by the Shire of Harvey in support of an Extractive Industries Licence (EIL) application by the Proponent, B & J Catalano Pty Ltd for a proposed project at Lots 4 and 5 Ludlow Road. Information contained in this report is also aimed at fulfilling the requirement for Town Planning Consent. Application forms for an EIL, Development Approval and Planning Approval under the Greater Bunbury Region Scheme are included with this report as Appendix 1.

This report sets out the proponents plans for the extraction of limestone on the property together with maps and photographs. It also provides an environmental assessment of the proposal and describes the environmental management measures the company will implement.

Management Plans for Water and Weeds are included as Appendixes to this report.

2. PROPERTY DESCRIPTION, OWNERSHIP AND LOCALITY

Property Description: Lots 4 and 5 on Deposited Plan 15419
Ludlow Road, Myalup
Shire of Harvey

Volume:	1884
Folio:	210
Area:	Lot 4 – 81.115 ha
	Lot 5 - 62.030 ha

Ownership:	Geoffrey Thomas Pearson T/A Pearson Nominees Pty Ltd
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The property is situated west of Forrest Highway, approximately 50km north of Bunbury. Lots 4 and 5 are bounded by Lake Preston to the west, Lot 2 to the north, Lot 17 to the east and Lot 18 to the south. Figure 1 shows the locality plan.

3. DESCRIPTION OF THE SITE AND ITS SURROUNDS

3.1 PRESENT LAND USE

Adjacent land to the property is used primarily for livestock pastures interspersed with remnant vegetation. The western boundary of the property adjoins Lake Preston, a Ramsar designated wetland.

Limestone extraction operations are currently being undertaken within the southern section of Lot 4 and northern section of Lot 5. The south-eastern section of Lot 5 is also used for cattle grazing. A road reserve runs between Lot 4 and Lot 5. Extraction activities have been undertaken within this road reserve as per an agreement between the Shire of Harvey and B & J Catalano. Access to the property is via Ludlow Road which is a minor, unsealed road.

The closest residence to the project is located 240m to the west of the proposed extraction area. This residence is used as holiday accommodation by the landowner. The landowner has no objections to the proposed operation, hence this residence is not considered a sensitive premises for the purpose of this application.

Figure 2 illustrates the land use of the property and its immediate surrounds.

3.2 TOPOGRAPHY AND DRAINAGE

The broad drainage pattern across the surrounding unaltered land surface is east to west towards Lake Preston. There are no surface drainage lines within the extraction area. Instead, rainfall infiltrates into the permeable soils.

The proposed excavation area is partially situated over a north-south trending ridge of dune/karstic topography with a maximum elevation of 23mAHD. The western extent of the proposed excavation has an elevation of approximately 12mAHD. The property contains a number of hills near the extraction area that reach an elevation of 35mAHD. From these hills to the eastern boundary of the property, the elevation decreases to approximately 15mAHD.

The property lies in the Harvey Diversion Catchment within the Harvey River Basin and does not fall within a Public Drinking Water Source Area. The property lies within a Rights in Water and Irrigation (RIWI) Act 1914 Groundwater Proclamation Area (South West Coastal Groundwater Area) but does not fall within a RIWI Surface Water Proclamation Area (Landgate 2018).

Lots 4 and 5 adjoin the eastern boundary of Lake Preston, which is listed as a conservation wetland, a Ramsar wetland, an Environment Protection Policy (EPP) Lake, and is included in the Department of Parks and Wildlife (DPaW) managed lands and waters. Three Dampland Multiple Use wetlands lie within 550m of the eastern property boundary (Landgate 2018) (Figure 2).

A summary of the methods that will be used to manage stormwater and off-site sedimentation are discussed in Section 5.5 of this report. Details of water management are included in the Water Management Plan as Appendix 2.

3.3 GEOLOGY AND SOILS

Shallow, sandy topsoil overlies inter-bedded limestone, calcarenite, marl and shell beds of the Tamala Formation. Previous work undertaken by Commander (1988) shows that the limestone is approximately 20m to 25m thick and unconformably overlies sands, shales and siltstones of the Leederville Formation.

The westernmost third of Lots 4 and 5 has a covering of calcitic caprock which is up to one metre thick, whilst further east, the limestone is covered by 0.5 to 1m of sand.

3.4 GROUNDWATER HYDROLOGY

A search of the Department of Water and Environmental Regulation (DWER) Water Information Reporting database found four bores (these are the Lake Clifton D1, D2, C4 and C5 bores), lying within the same catchment as the property, for which sufficient water level data was available to build and interpret hydrographs. Hydraulic gradients and flows in the area are heavily influenced by groundwater discharge to the eastern shore of Lake Preston. Because of the uniformity of the groundwater gradient north to south the conditions observed at these bores are considered to be representative of the groundwater conditions at the property, even though these bores are located approximately 5.5km to the south and 5.5km to the north of the property (Figure 2).

Details on the bores and associated hydrographs have been provided in the Water Management Plan (Appendix 2). Using publicly available groundwater level data, it is estimated that the highest water table that occurred at the proposed EIL area was 0.15mAHD at the western boundary, and 0.5mAHD at the eastern boundary. Since the proposed extraction depth is 6mAHD, no groundwater is expected to be intercepted during limestone extraction.

3.5 VEGETATION

The property is situated in the Southwest Botanical Province of Western Australia (Beard 1990), and within the Swan Coastal Plain bioregion (Perth subregion) as described by the Interim Biogeographic Region of Western Australia (DoEE 2018). At a regional level the property occurs within the Cottesloe-Central and South vegetation complex which is described as a mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops. The Cottesloe Complex-Central and South has 32.2% of the pre-European extent remaining on the Swan Coastal Plain and 41.8% remaining

within the Shire of Harvey (DBCA 2017) which meets the EPA's Natural Area Strategy objective of retention of at least 30% of the pre-clearing extent on the Swan Coastal Plain.

An Environmentally Sensitive Area (ESA) is an area where the vegetation has high conservation value and cannot be cleared. ESAs are declared by the Minister in the Environmental Protection (Environmentally Sensitive Areas) Notice 55 (2005) under section 51B of the Environmental Protection Act 1986. There is no ESA within the project area. Lake Preston is listed as an ESA, and is located approximately 250 from the project area.

No Department of Biodiversity Conservation and Attractions (DBCA) listed Threatened Ecological Communities (TECs) have been previously recorded within the project area. The closest recorded TEC is approximately 2km north of Lot 4 (Threatened Ecological Communities, DBCA-038). According to a map of potential EPBC Act listed TECs, Banksia Woodlands of the Swan Coastal Plain may occur within the project area (DoEE 2018).

The project area is not within the Bush Forever mapping area (DOP 2018). The project area lies within a Tuart Woodlands, as mapped by CALM (2003) in the "Tuart Atlas", which maps and assesses data on tuart occurrence, overstory density and understory condition on the Swan Coastal Plain. The Atlas has classified the tuart woodland polygon within the project area as 10-19% canopy density and classified the visible native understory condition as highly disturbed.

A reconnaissance survey of the proposed extraction area was undertaken by Lundstrom Environmental Consultants Pty Ltd on 19 April 2018 to verify information obtained from desktop assessment. A selective, low intensity survey of the flora and vegetation was undertaken to describe the general vegetation characteristics and conditions at an appropriate scale. A copy of the survey results has been included in Appendix 3.

For the survey two vegetation types were recorded within the proposed extraction area:

- Vegetation Type 01: Open woodlands of *Eucalyptus gomphocephala*, *Eucalyptus decipiens* and *Agonis flexuosa* over very occasional *Kunzea ericifolia*, pasture grasses and various weeds, predominately *Gomphocarpus fruticosus* and *Solanum linneanum* in grey sands with occasional limestone outcrops. This vegetation type is present in the southern section of the assessment area, predominantly the portion of the assessment area within Lot 5.
- Vegetation Type 02: Closed low woodland of *Eucalyptus decipiens*, *Eucalyptus petrensis*, *Agonis flexuosa*, and isolated *Banksia attenuata*, and *Nuytsia floribunda* over *Melaleuca viminea* and *Templetonia retusa* and occasional *Rhagodia baccata* and *Hardenbergia comptoniana* on grey sands with numerous limestone outcrops. This vegetation type is predominately on either side of the ridge within the assessment area, which runs in a north-south direction through the portion of the assessment area within Lot 4.

No Threatened or Priority Ecological Communities or Threatened or conservation significant flora or Priority flora (EPBC Act, WC Act or DBCA listed) were identified within the assessment area. There were a number of very wide *Agonis flexuosa* trees scattered within the southern portion of the assessment area (Lot 5). Lot 5 also contained a number of large *Eucalyptus gomphocephala* scattered throughout.

The vegetation quality is generally degraded with no native ground cover and a prevalence of weed species due to past use of the site for cattle grazing. Four weed species were recorded within the assessment area, of which *Gomphocarpus fruticosus* (narrow leaf cottonbush) and *Solanum linneanum* (apple of Sodom) are listed as Declared Plant species in Western Australia pursuant to Section 22 of the Biosecurity and Agriculture Management Act 2007.

There was no evidence of dieback infestations at the site based on the apparent health of dieback susceptible species (i.e Banksia species).

A clearing permit for the proposed extraction area has been applied for to clear approximately 12.9ha of native vegetation as shown on Figure 3.

3.6 CURRENT ZONING

The area is zoned as 'General Farming' in terms of the Shire of Harvey Town Planning Scheme No. 1 (Shire of Harvey, 1996) and 'Rural' in terms of the Greater Bunbury Region Scheme (WA Planning Commission, 2017).

4. DEVELOPMENT ON THE PROPERTY

4.1 PROPOSED EXTRACTION AREA

B & J Catalano Pty Ltd have been operating a limestone extraction pit on this property since 2009 (under Extractive Industries Licence Ref:15/06142). The extent of the extraction undertaken to date is shown in Figure 3.

The proposed limestone extraction area measures 25ha total and is illustrated in Figure 3.

The approximate annual removal of limestone over the 5 year licence period will be 95,000 tonnes but actual extraction volumes will depend on demand.

Proposed mining actions are as follows:

- The extraction of limestone from a total area of 25ha.
- Prior to extraction taking place, removal of existing trees (12.9ha under Clearing Permit) will be undertaken by mechanical means. Cleared vegetation will be windrowed and redistributed as part of the rehabilitation process.
- Topsoil and overburden will be removed from the extraction area in stages with only the areas targeted for immediate extraction being opened. Topsoil and over-burden will be stockpiled separately along the edges of the extraction area, with stockpiles being no higher than three metres.
- A mobile crushing and screening plant will be used for approximately eight weeks per annum on site to prepare the material for haulage offsite.
- The final pit floor after extraction will be 6m AHD (Figure 4a).
- Measures to limit noise and dust from this part of the operations are discussed separately in Sections 5.6 and 5.7.
- Rehabilitation with native vegetation will be done in accordance with the Clearing Permit and the remaining area will be sown to pasture grasses.

Rehabilitation is further detailed in Section 6.3. Table 2 below summarises the actions that are to take place on the property over the next 5 year licence period 2018 to 2022.

Table 1: Stages of the Extraction Operation

Action	2018	2019	2020	2021	2022
Remove existing trees					
Excavate and crush limestone					
Remove material by truck					
Rehabilitate (in winter)					

4.2 SITE ACCESS AND EGRESS ROADS

Access to the site will be obtained off Ludlow Road which is surfaced with limestone. The access road is pre-existing due to previous excavation and is maintained by B & J Catalano Pty Ltd (Figure 3).

4.3 ESTIMATED TRAFFIC TO BE GENERATED

Estimates of traffic movements are:

Total annual limestone removal:	95 000 tonnes approx. (59 300m ³)
Number of working days per month:	24 days
Vehicle payloads (GAV's ¹):	Road train (56 tonnes) Rigid truck and trailer (42 tonnes) Single Semi-loader (25 tonnes)
Proportional use:	56 tonners (80%), 42 tonners (15%) 25 tonners (5%)

The above estimates suggest an average of 14 truck trips (in and out) per working day, but this will be dependent on demand. Operating times will be Monday to Saturday 6am to 6pm.

¹ General Access Vehicle (in terms of Road Traffic Rules and Regulations 2002)

5. POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MANAGEMENT

Short term environmental impacts are to be expected in the process of all quarrying actions. However, these can largely be mitigated over the medium to long term provided that the project is carried out in accordance with regulatory conditions and that rehabilitation measures are implemented as proposed. The following possible environmental aspects have been considered to ensure that all potential major impacts are addressed. It is not anticipated that the proposed extraction area will have a significant impact on any of the following.

5.1 FLORA AND FAUNA

Assessment of the flora and vegetation values of Lots 4 and 5 Ludlow Road was undertaken based on a desktop review and reconnaissance survey over the proposed extraction area (the assessment area) conducted in April 2018 (Appendix 3).

No threatened or conservation significant flora were recorded within the assessment area during the reconnaissance survey.

A literature review and database searches identified 13 conservation significant species as listed under the EPBC Act or the WC Act, or listed by the DBCA as Priority flora with the potential to occur within a five km radius of the assessment area (One Threatened Flora and 12 Priority Flora). Of these the only 2 species were considered to have a “possible” potential of occurring within the assessment area. These were *Conostylis pauciflora* subsp. *Pauciflora* (P4) and *Pterostylis frenchii* (P2).

A Level 1 fauna survey, including a literature review and a field reconnaissance survey was undertaken on the proposed extraction area in May and June 2018 (Appendix 4). Because some listed threatened species (e.g. three species of black cockatoo and the western ringtail possum) are known to occur in the general area, the scope of the survey work was expanded to include a targeted assessment of the site’s significance to these species.

The subject site is surrounded by vegetation in a similar condition and does not represent a key “linkage” or “corridor” for wildlife movement and the relatively small amount of clearing likely to be required is not likely to create any significant barriers to fauna movement on a local or regional scale (Harewood, 2018).

Overall the subject site cannot be regarded as representing quality black cockatoo foraging habitat. Tuarts and peppermint are only foraged upon rarely and the number of jarrah and banksia trees present is very small and would amount to far less than 1ha in total. No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

Two trees appeared to contain hollows with larger entrances (greater than ~10cm) that would possibly be big enough to allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk. It is recommended that consideration be given avoid these two trees by moving the boundary of the proposed excavation area.

No evidence of western ringtail possums using the subject site was found during the day or night surveys i.e. no fresh dreys, no scats and no individuals. The generally poor quality of the habitat present (e.g. lack of favoured foraging species) and the results of the survey work suggest that they do not occur in the subject site.

With respect to native vertebrate fauna, 12 mammal (including nine bat species), 82 bird, 15 reptile and two frog species have previously been recorded in the wider area, some of which have the potential to occur in or utilise sections of the subject site at times. Eight species of introduced animals could also frequent the area.

Of the 111 native animals that are listed as occurring or potentially occurring in the area, five are considered to be endangered/vulnerable or in need of special protection under State and/or Federal law (i.e. Carnaby's black cockatoo, Baudin's black cockatoo, forest red-tailed black cockatoo, peregrine falcon and the south-western brush-tailed phascogale). In addition, one DBCA priority species (i.e. western false pipistrelle) may also be present or frequent the area at times.

5.2 WEEDS

Current operations on Lot 4 and 5 Ludlow Road are subject to the conditions of EIL 15/06142. Existing approvals stipulate that B & J Catalano Pty Ltd comply with the endorsed Weed Management Plan. B & J Catalano Pty Ltd has implemented the Weed Management Plan as described in Appendix 5 of this report.

Two weed species present on the property *Gomphocarpus fruticosus* (Cotton Bush) and *Solanaum linneanum* (Apple of Sodom) are declared under the *Biosecurity and Agriculture Management Act 2007*, and therefore require control methods associated with them (DAF 2014). These are outlined in the Weed Management Plan.

5.3 ALTERATION OF THE LAND SURFACE

Though the original land surface will be altered to a final level of 6 mAHD, moderate slopes of 1:6 will remain, which is not dissimilar to slopes occurring naturally within the surrounding landscape. The proposed final land surface is illustrated in Figures 4 and 5.

The base of the excavation will be approximately 4.5m above the highest ever water table with a further 0.2m top soil replaced and therefore no groundwater will be exposed in the long term.

5.4 VISUAL IMPACT

The proposed extraction is unlikely to create a visual impact due to remnant topography on either side of the proposed extraction area, and the natural undulation of the landscape.

The nearest residence is owned by the landowner who has no objections to the proposed extraction operations.

The nearest main road, Forrest Highway, is located approximately 2.5km east of the proposed extraction area. There is an existing 40m buffer zone of native vegetation between Ludlow Road and extraction activities on the property. Since the extraction area is well screened by existing vegetation on the property and on neighbouring properties, no visual impact will occur. Previous extraction activities has not resulted in any significant visual impact. No visual impacts are therefore anticipated.

5.5 WATER

In 2017 the Department of Environment and Energy determined that the excavation of limestone from 6.8ha in addition to existing operations was not a controlled action under section 78 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) if undertaken in a particular manner. The manner in which the existing works are carried out conform to the conditions of the above decision.

Given the proximity of the proposed new excavation to the Peel-Yalgorup System Ramsar Wetland (~ 250m), measures will continue to be taken to avoid impacts on these wetlands of international importance. Potential impacts include erosion and off site sedimentation during storm events, contamination of surface and ground water and alteration of surface and ground water levels. The likelihood of occurrence of these impacts and the water management measures to be undertaken are discussed below.

5.5.1 STORMWATER MANAGEMENT

Stormwater management issues are not anticipated for this property due to the high permeability of the land surface. No surface water runoff from the working areas will be discharged to the surrounding unaltered landscape as any stormwater runoff will be contained in the base of the extraction area. The pit floor may be periodically inundated due to sediment deposition effecting infiltration rates. At pit closure the pit floor will be deep ripped and the battered slopes will be revegetated.

5.5.2 SURFACE WATER MANAGEMENT

No surface water occurs within the extraction site. Due to the very permeable nature of the sand within the operational area, and the revegetation techniques to be employed, it is unlikely that any long-lived expression of surface water will exist within the proposed extraction area. The recommended buffer of at least 200m from Lake Preston will be maintained throughout the operational life of the extraction activities. Proposed activities will not directly impact this conservation area.

5.5.3 GROUND WATER MANAGEMENT

Risk of groundwater contamination is negligible due to the small volumes of contaminants used, careful operating procedures and the maintenance of a minimum depth to the underlying water table of approximately 4.5m from the pit floor. If groundwater is exposed during excavations then operations will cease until the pit is refilled to achieve a 2m buffer distance above the water table. No dewatering activities will be undertaken. The final rehabilitated land surface will be 5m above the maximum winter high groundwater level.

There will be no storage of fuels, lubricants or other toxic or hazardous chemicals on site. Refuelling will take place using a mobile refuelling vehicle which is equipped with a “snap-on snap-off, fast-fill and auto shut-off” facility. Plant will be refuelled each morning, leaving the vehicles almost empty overnight.

No major servicing, which could lead to fuel and oil spills, will take place on the site. Servicing of any vehicle will take place at least 200m from the shore of Lake Preston. Prior to servicing, a suitably sized spill mat or drip tray will be placed under the vehicle to capture any leaks or spills. Servicing of vehicles will consist of the direct vacuuming of and waste fluids from the engine of the vehicle being serviced to a waste oil tank on the service truck. A drum will be placed under the oil filter of the vehicle being serviced prior to its removal. Any material captured in the drip tray or drum during the course of servicing will be disposed of into the waste facility of the service truck, removed off site and disposed of at an appropriately licensed waste facility. Spill kits will be kept on all service truck(s) at all times, when servicing vehicles on site. Any spills will be contained on site, mitigated and recorded. The Western Australian Water Quality Protection Guidelines No's 6,7,10 and 11 will be adhered to, to prevent hydrocarbons or other contaminants from being spilled into the Peel-Yalgup System Ramsar Wetland.

5.6 NOISE

The proposed extraction activities will create some operational noise, the majority of which will be generated by bulldozers, screening, loaders and haulage trucks. This noise is expected to be localised and create minimal nuisance beyond the boundary of the extraction area.

The EPA environmental assessment guideline “Separation Distances between Industrial and Sensitive Land Uses” lists the generic buffers for sand and limestone pits as 300-500m depending on the extent of the processing (EPA 2015). The nearest noise sensitive premise is a residence owned by the landowner, located approximately 240m to the west of the proposed extraction operations. No other residences are located within 1km of the proposed activity. A vegetation buffer exists between the landowner's residence and the extraction area. During previous quarrying on the property no noise issues were recorded. No offsite noise impacts are anticipated due to the surrounding vegetation and distance to residential areas.

5.7 DUST

The proposed extraction may emit dust from the following activities:

- Removing topsoil.
- Excavation of limestone.
- Loading of haulage trucks.
- Equipment movement on unsealed surfaces.
- Crushing and screening.

The EPA guidance “Separation Distances between Industrial and Sensitive Land Uses” lists the generic buffers for sand and limestone pits as 300-500m depending on the extent of the processing (EPA 2015). There are no dust sensitive premises located within 1km of the proposed operations, with the exception of the landowner’s premises. The landowner’s residence is screened from the extraction area by a belt of native vegetation and the landowner has no objections to the proposed operations.

In summer, the prevailing wind direction is from the east in the morning and the south-west in the afternoon. A summary of dust control measures to be implemented are summarised in Table 3. Visual monitoring will be undertaken to confirm dust management measures are effectively maintaining dust emissions at acceptable levels.

Table 2: Summary of Dust Control Actions

Activity	Action	Control Measure	Result
Daily			
Limestone extraction and product loading	Visual inspection of site and access road for dust generation that is moving off site.	Water cart application over dust prone areas to reduce dust lift off. Crushing and stockpiling activities located in topographic low points with stockpiles arranged such that windbreaks are created to further shield sensitive receptors.	Reduced dust generation. No dust leaving the property.
Product transport	All loads covered before leaving the property.	Cover loads.	Reduced dust generation from product transport.
As Required			
Training	Induct all employees and contractors working on site.	Site induction includes awareness of dust generation and management measures to be utilised by all personnel on site.	Activities undertaken to minimise dust generation on site.
Dust complaints	Provide a contact number for dust complaints.	Undertake review of potential complaints and implement appropriate action to reduce dust generation from site.	Reduced dust generation from the property.
Rehabilitation /stabilisation of completed areas	Undertake rehabilitation on completed areas.	As per Section 6 of this report.	Reduced dust generation from the property.

5.8 ACID SULPHATE SOILS

A search of the CSIRO's Australian Soil Resource Information System (ASRIS) database identified the area as having an extremely low probability of occurrence for acid sulphate soils (ASRIS, 2018). This is further supported by the main soil type in the area being identified as deep sandy soils with limestone outcrops.

5.9 DIEBACK MANAGEMENT

During a recent field survey no *Phytophthora* sensitive species were observed to exhibit signs of dieback infestation. The following preventive measures have been already implemented and will continue to be adhered to:

- The property will be fenced at all times.
- Access to the property will be via a single entrance gate.
- All machinery, trucks and other vehicles will arrive in a clean condition free of soil and organic matter that may contain dieback fungus.
- Any soil and plant material brought to the site for rehabilitation purposes should be from dieback free sources.
- Employees and contractors working on the site will be informed of the purpose of the above measures and their responsibilities in relation to dieback prevention.

5.10 HERITAGE SITES

A search of the Department of Aboriginal Affairs AHIS (Aboriginal Heritage Inquiry System) system did not identify any register or other heritage conforming to Section 5 of the *Aboriginal Heritage Act 1972* on Lots 4 and 5 Ludlow Road (Department of Planning Lands and Heritage 2018). The search reports have been included in Appendix 6. In the event that during the course of activities on this property an Aboriginal cultural heritage site is discovered, B & J Catalano Pty Ltd will immediately advise the Department of Planning, Lands and Heritage.

6. REHABILITATION

B & J Catalano Pty Ltd is committed to revegetating 5ha within the pit perimeter under existing approvals (EIL 15/06142). A further 13ha will be rehabilitated as part of the proposed excavation area giving a total of 18ha of revegetated land and 28ha of pasture grasses. The areas planted with native vegetation will have a similar species composition, structure and density to the pre-cleared vegetation types in the area.

The approval of the current Extractive Industries License 1/06142 that covers the existing operation on Lot 4 and 5 Ludlow Road included the endorsement of a rehabilitation plan and a list of species to be used in rehabilitation. The endorsed species list will be applied to the rehabilitation of the proposed new extraction area.

6.1 PROPOSED REHABILITATION MEASURES

Rehabilitation will commence once extraction within the area is complete with the following steps being implemented:

- All batters behind the active working face will be contoured to achieve a slope gradient of no more than 1:6. The final rehabilitated pit floor will be at 6 mAHD;
- Stockpiled topsoil/ overburden will be respread over completed areas;
- The pit floor and batters will be ripped to alleviate compaction, improve filtration, attenuate stormwater runoff and facilitate rapid root penetration;
- The base of the pit will be seeded with pasture grasses which will be used for cattle grazing;
- An area of batter slopes of approximately 13ha will be revegetated using endemic species of local provenance using both direct seeding and planted seedlings.
- Rehabilitation work will only be carried out just prior to or during winter, within 6 months of cessation of extraction activity; and
- Due to the internally draining nature of the pit no offsite sedimentation issues are anticipated. Stormwater within the pit will continue to infiltrate to the underlying water table.

The proposed final land surface is shown in Figures 4 and 5.

6.2 MONITORING AND MAINTENANCE

During the extraction and early rehabilitation phase, the extraction area will be inspected after every significant rainfall event to check erosion damage. If any repairs are required, this will be attended to immediately.

After pit closure the areas sown with pasture grasses will be monitored to ensure that any areas requiring remedial work are identified. Monitoring will be carried out on an annual basis to assess:

- The physical stability of the landform in the rehabilitated areas.
- Evidence of concentrated sheet flow rather than infiltration.
- The emergence of weeds requiring control.

Maintenance procedures will be carried out where necessary and may include:

- Repair of any erosion damage.
- Replanting/seeding areas that may not have regenerated sufficiently.
- Weed control.

6.3 COMPLETION CRITERIA

Completion criteria have been defined to ensure that the overall objectives of the rehabilitation are met. The completion criteria for rehabilitation back to pasture grasses for extractive operations on Lot 4 and 5 are presented in Table 4.

Table 3: Completion Criteria, Objectives and Interim Targets

Criteria	Objective	Interim Targets
Safety	The site is safe to humans.	Site is safe to humans during operations.
Sustainability	The site is sustainable in the long term without additional management inputs.	-
Suitability	The site is suitable for use as pasture.	-
Visual amenity and heritage	The rehabilitated extraction area blends into the surrounding environment.	No public complaints about a loss of visual amenity.
Soils and stability	Soil profiles and structures are sufficient to ensure grass establishment. The landform is stable. Stormwater is contained within the site.	Topsoil is respread in all rehabilitation areas. Identification and mitigation of potential erosion scars and scours during operations.
Weeds	No new declared weed pests are present. The level of weed species should not be detrimental to the planted seedlings or horticulture.	Declared weed species removed systematically during operations.

A Permit to Clear Native Vegetation under the *Environmental Protection Act 1986* is required prior to the commencement of clearing operations. The conditions of the Clearing Permit are likely to require that detailed native vegetation rehabilitation, monitoring and maintenance plans are prepared. These plans can be made available to the Shire of Harvey on request.

7. REFERENCES

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FIGURES

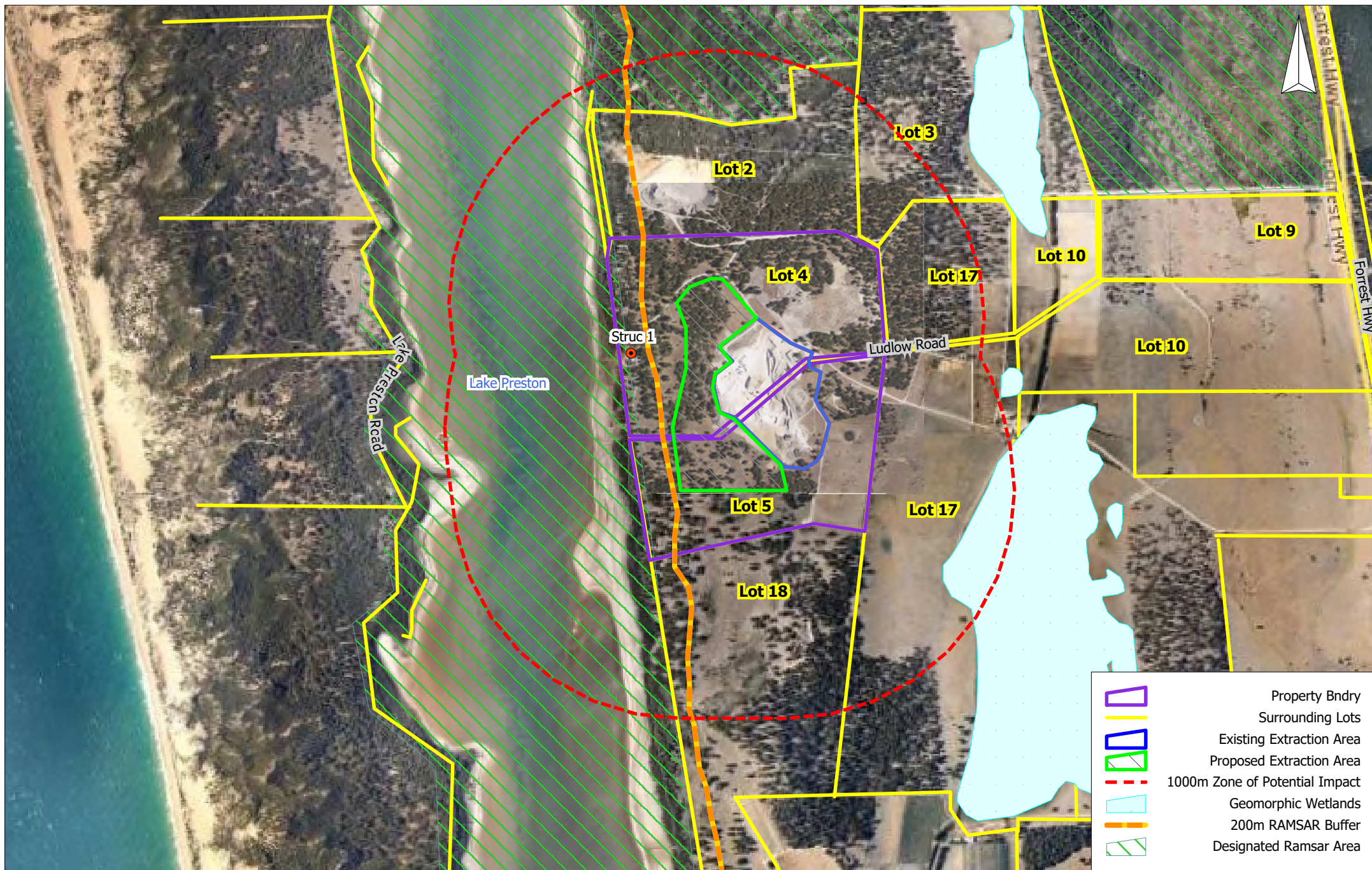


Lundstrom Environmental Consultants Pty Ltd
 21 Sellen Court,
 Leeming WA 6149
 mikelund1@bigpond.com
 0417934863

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 Air Photo Date: NATMAPS
 Datum: Australian Geocentric 1994 (GDA94)

B&J Catalano Pty Ltd
Lots 4 & 5 Ludlow Rd
Limestone Extraction

Locality Plan
Figure 1



**Lundstrom Environmental
Consultants Pty Ltd**

21 Sellen Court, Leeming WA 6149
mikelund1@bigpond.com
0417934863

Scale: 1:21000
Original Size: A4
Air Photo Date: Nearmap Jan 2018
Datum: Australian Geocentric 1994 (GDA94)

**B&J Catalano Pty Ltd
Lots 4 & 5 Ludlow Rd
Limestone Extraction**

Property and Surrounds

Figure 2



- ▮ Existing Extraction Area
- ▮ Proposed Extraction Area
- ▮ 200m Ramsar Buffer
- ▮ Access Road
- ▮ Cross Sections
- ▮ Topography mAHd

Lundstrom Environmental Consultants Pty Ltd

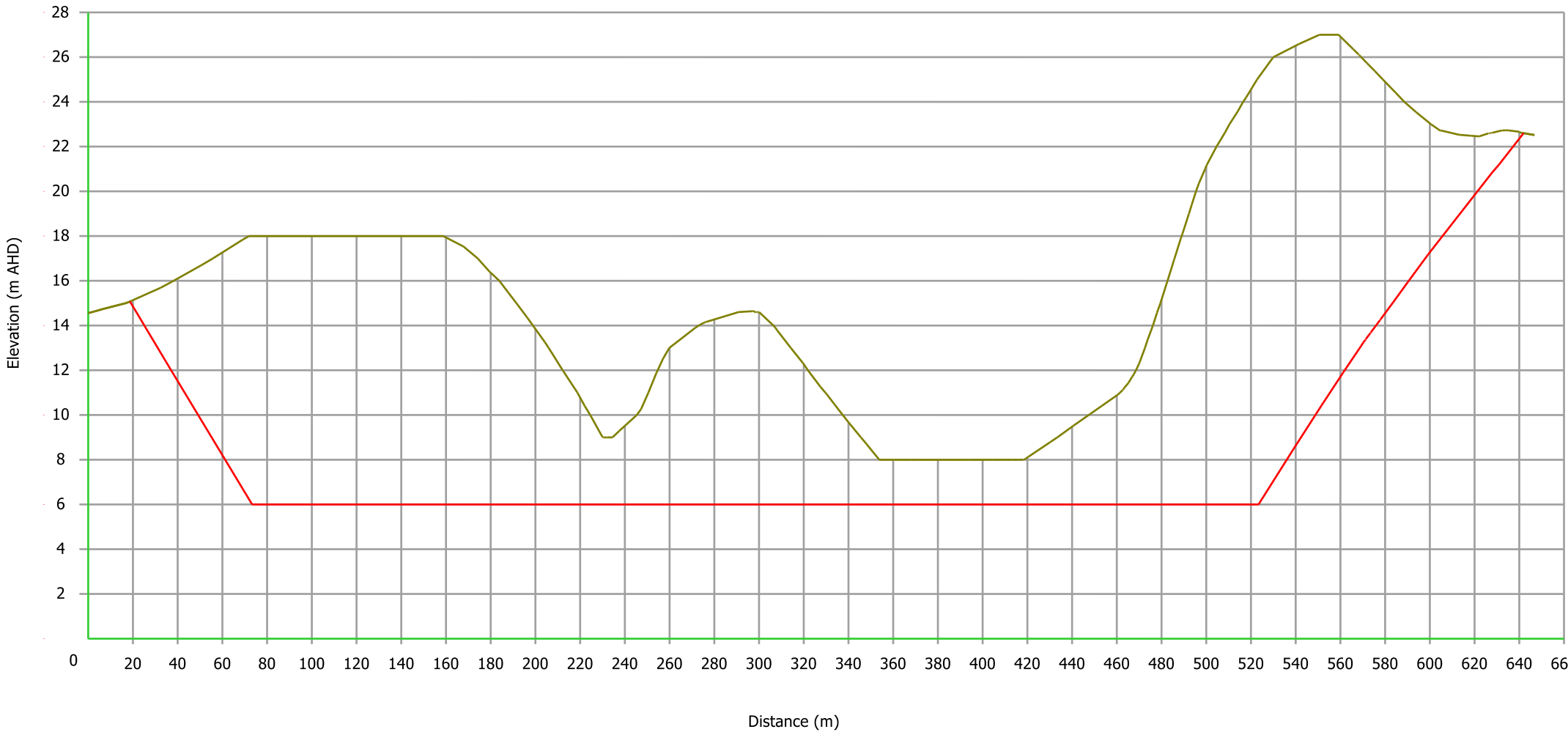
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B&J Catalano Pty Ltd
Lots 4 & 5 Ludlow Rd
Limestone Extraction

Proposed Extraction Area

Figure 3



— Natural Landsurface
— Final EIL Landsurface

**Lundstrom Environmental
Consultants Pty Ltd**

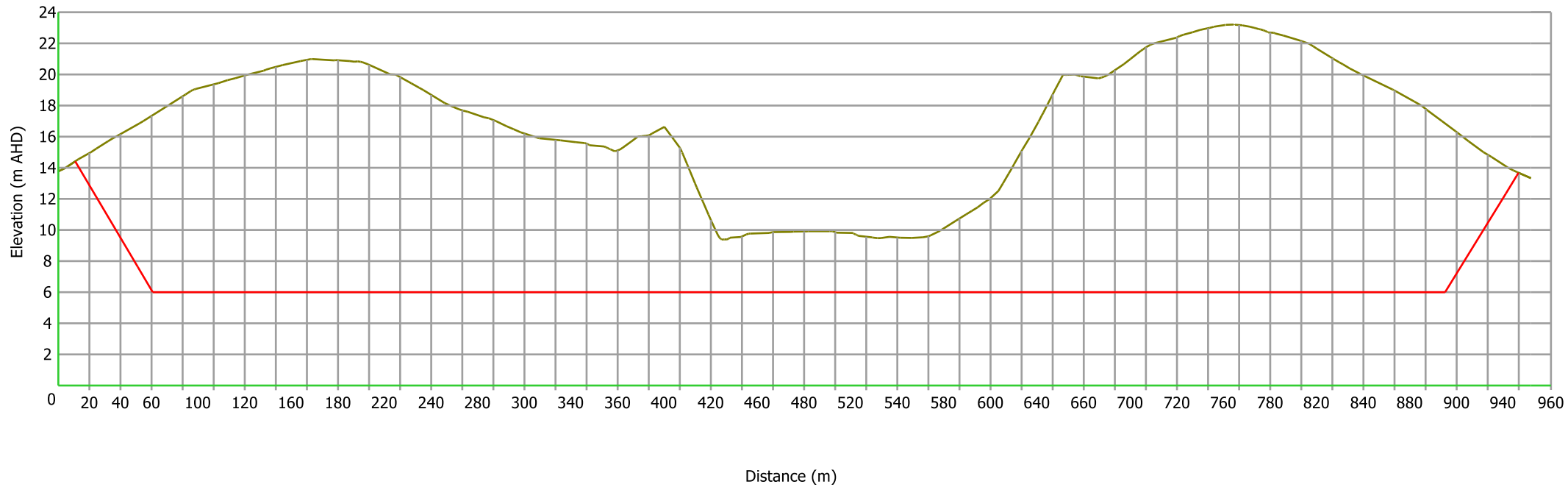
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0417934863

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Original Size: A4
Vertical Exaggeration: 1:10

**B&J Catalano Pty Ltd
Lots 4 & 5 Ludlow Rd
Limestone Extraction**

Cross Section WE

Figure 4a



— Natural Landsurface
— Final EIL Landsurface

**Lundstrom Environmental
Consultants Pty Ltd**

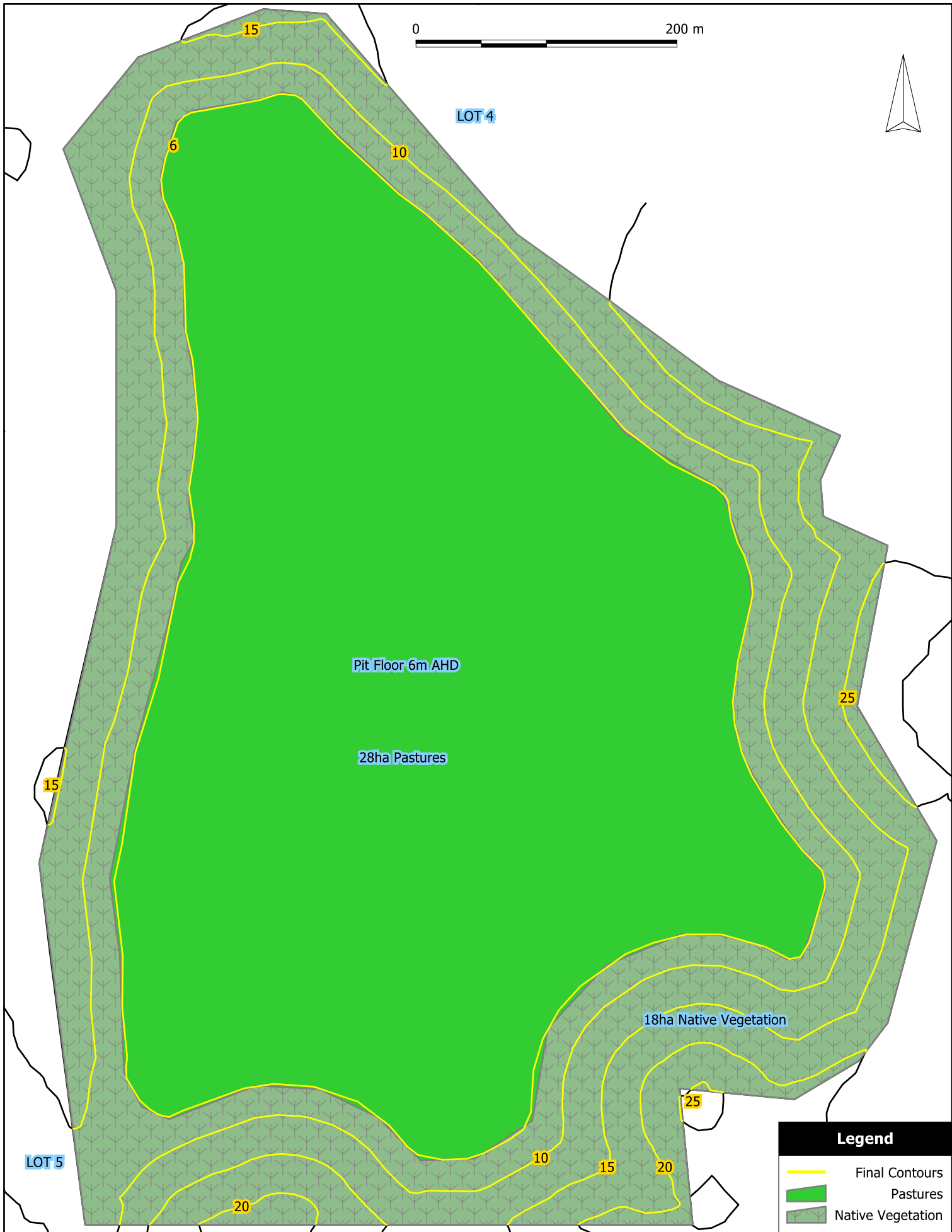
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mikelund1@bigpond.com
0417934863

Scale: 1:3600
Original Size: A4
Vertical Exaggeration: 1:10

**B&J Catalano Pty Ltd
Lots 4 & 5 Ludlow Rd
Limestone Extraction**

Cross Section NS

Figure 4b



<p>Lundstrom Environmental Consultants Pty Ltd</p> <p>21 Sellen Court, Leeming, WA 6149 Mob 0417934863 mikelund1@bigpond.com</p>	<p>Scale: 1:3700 Original Size: A4 Air Photo Date: Landgate February 2012 Datum: Australian Geocentric 1994 (GDA94)</p>	<p>B & J Catalano Pty Ltd</p> <p>Lots 4 & 5 Ludlow Rd, Myalup Limestone Extraction</p>	<p>Final Land Surface</p> <p>Figure 5</p>
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APPENDIXES

APPENDIX 1
EXTRACTIVE INDUSTRY LICENCE APPLICATION, TOWN PLANNING CONSENT APPLICATION AND
GBRS PLANNING APPROVAL APPLICATION

SCHEDULE 3

SHIRE OF HARVEY

Clause 6

APPLICATION FOR AN EXTRACTIVE INDUSTRY LICENCE

1. Name B & J Catalano Pty Ltd ("the applicant")
2. Address South Western Highway, Brunswick Junction WA 6224
3. Telephone 9726 8100 Fax 9726 1575
4. Address and locality of proposed excavation site
Lot 4 and Lot 5 Ludlow Road, Myalup
5. Lot No. Lot 4 and Lot 5
6. Location No.
7. Plan or Diagram No. 15419
8. Certificate of Title Volume 1884 Folio 210 and 211
9. Owner of the Land Geoffrey Thomas Pearson
10. Address of owner of the land
Lot 43 Ditchingham Place, Australind 6833
11. Material to be excavated Limestone
12. If the application covers land that is the subject of an existing licence:
Date of issue of that licence 4th of June 2015
Date of expiration of that licence 4th of June 2020
Conditions applicable to that licence as per Shire records
13. Term of licence sought Five (5) years
14. Submitted with this application are:
 - (a) 3 copies of excavation site plans (cl. 6(1)(a))
 - (b) 3 copies of works and excavation programme (cl. 6(1)(b))
 - (c) 3 copies of rehabilitation and decommissioning programme (cl. 6(1)(c))
 - (d) datum peg evidence (cl. 6(1)(d))

- (e) licensed surveyor's certificate (cl. 6(1)(e))
- (f) evidence of compliance with cl 5(1) and (2) (cl. 6(1)(f))
- (g) copies of all land use planning approvals (cl. 6(1)(g))
- (h) written consent of the owner of the excavation site (cl. 6(1)(h))
- (i) any other information that the Council has required (cl. 6(1)(i))
- (j) licence application fee of \$500 (cl. 6(1)(j))

The applicant applies for a licence in respect of the proposed excavation site in accordance with and subject to the Shire of Harvey Extractive Industries By-law.

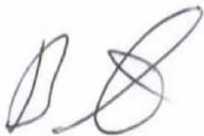
Dated this 30th day of April 2018



Signature of Applicant



Signature of Owner of the land



Signature of existing licensee
(if applicable)

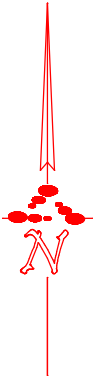
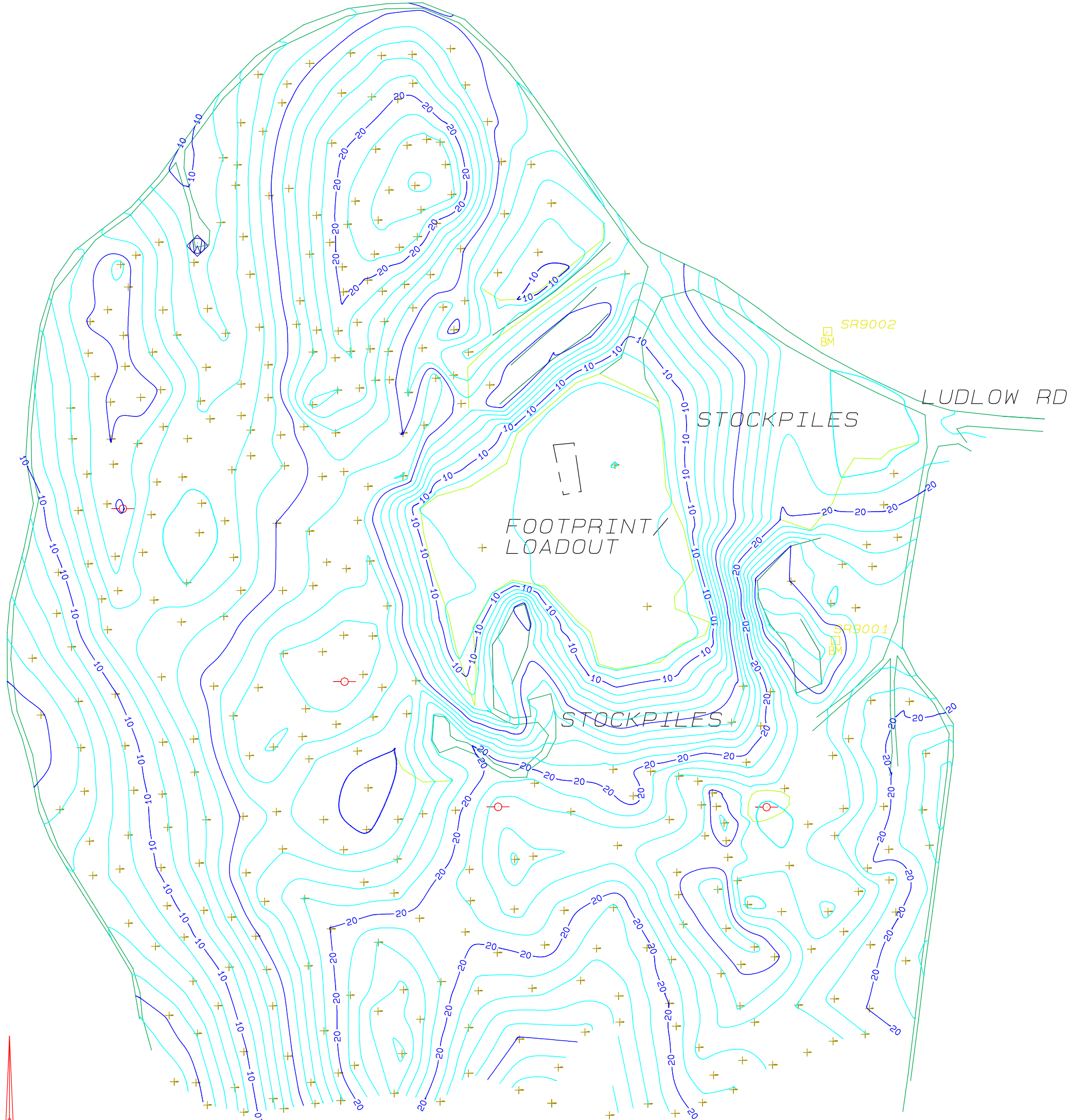
VERTICAL DATUM IS APPROXIMATE AHD ONLY AND HEIGHTS HAVE BEEN ADOPTED FROM SSM PINJARRA 145 WITH A SUPPLIED VALUE OF 4.005m

THIS PLAN MAY ONLY BE USED FOR CONTOUR AND FEATURE PURPOSES. THE TITLE BOUNDARIES AS SHOWN HEREON WERE NOT MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY. POSITIONED OVER EVIDENCE OF OCCUPATION

IT SHOULD BE NOTED THAT UNDERGROUND SERVICES DID NOT FORM PART OF THIS SURVEY, THEREFORE PRIOR TO ANY DEMOLITION, EXCAVATION, OR CONSTRUCTION, THE RELEVANT AUTHORITY SHOULD BE CONTACTED, AND THE CERTIFICATE OF TITLE CHECKED FOR EASEMENTS AND ENCUMBRANCES

SURVEY CARRIED OUT USING RTK GPS, POSITIONS AND HEIGHTS ARE ACCURATE TO +/- 30MM

CONTOUR INTERVAL : 1m



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REV	DESCRIPTION	DATE	CHK
0	INITIAL ISSUE	27/04/18	CDJ



CLIENT:




AUTHORITY: SHIRE OF HARVEY

SURVEYOR:	CHRIS GOODE
DATE OF CAPTURE:	23/04/18
DRAFTSPERSON:	CHRIS GOODE
DATE DRAWN:	26/04/18

PROJECT NAME:	LUDLOW ROAD
DRAWING TITLE:	CONTOUR SURVEY
WAPC NO:	N/A
DRAWING NO:	SR2000-93-001

HOR DATUM:	MGA95 Z50
VERT DATUM:	AHD
SCALE:	1:3500 @ A3
FILE REF:	S:\0000\Operations\182181 Current Jobs\SR2000-93_B&J_Catalano_Ludlow_Rd_Mydata\7Digital Files\180426_Ludlow_FeatureSurvey_Chris
SHEET NO:	1 of 1
A3	

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www.surveyresults.com.au

Checked	Date	Approved
CDJ	27/04/18	B O'Sullivan General Manager

9 April 2018

TO WHOM IT MAY CONCERN

I, Geoffrey Thomas Pearson of Pearson Nominees Pty Ltd, am the registered owner of Lot 4 Ludlow Road, Myalup, WA 6220.

I hereby grant permission for B & J Catalano Pty Ltd and their consultant, Lundstrom Environmental Consultants Pty Ltd, to make applications for all the necessary licences and permits to access and clear native vegetation and extract gravel on these properties.

Yours faithfully



Geoffrey Thomas Pearson



Shire of Harvey
District Planning Scheme No. 1

Office Use only
Registration No.: ____
Assessment No.: ____
Synergy No.: ____
Application Type: ____

APPLICATION FOR DEVELOPMENT APPROVAL

Owner/s Details and Consent			
Name/s	Geoffrey Thomas Pearson		
ABN (if applicable)			
Address	Lot 43 Ditchingham Place		
Suburb	Australind	Post Code	6233
Phone Home		Mobile	042 995 2290
Phone Work		Fax	
Email			
Contact Person:			
Signature:		Signature:	
Date:	3/5/18	Date:	
<p><i>Note: The signature of the owner/s is required on all applications. This application will not proceed without that signature. For the purposes of signing this application an owner includes the persons referred to in the Planning and Development (Local Planning Scheme) Regulations 2015 Schedule 2 clause 62(2).</i></p>			

Applicant's Details (if different from owner)			
Name/s	B & J Catalano		
Address	South Western Highway		
Suburb	Brunswick Junction	Post Code	6224
Phone Home		Mobile	
Phone Work	9726 8100	Fax	9726 1575
Email	peterbennett@catalano.com.au		
Contact Person for Correspondence:	Michael Lundstrom, Lundstrom Environmental Consultants, 041 793 4863		
<p>The information and plans provided with this application may be made available by the Shire for public viewing in connection with the application. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>			
Signature:		Date:	3/5/18

Property Details					
Lot No:	4 and 5	House/Street No:		Location No:	
Diagram or Plan No.	15419	Certificate of Title Vol. No:	1884	Folio:	210 and 211
Title encumbrances (e.g easements, restrictive covenants):					
Street name	Ludlow Road		Suburb	Myalup	
Nearest Street Intersection	Forrest Highway				

Proposed Development	
Nature of Development:	<input type="checkbox"/> Works <input type="checkbox"/> Use <input type="checkbox"/> Works and Use
Is an exemption from development claimed for part of the development? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If yes, is the exemption for: <input type="checkbox"/> Works <input type="checkbox"/> Use	
Detailed Description of proposed works and/or land use:	
Expansion of area used for extraction of limestone	
Description of exemption claimed (if relevant):	
Nature of any existing buildings and/or land use:	Extractive industry, Pastures
Approximate cost of proposed development (excluding GST):	N/A
Estimated time of completion:	2023

Bushfire Prone Area	
Is the property wholly or partly located within a designated Bushfire Prone Area?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
If yes, have you attached a: <input type="checkbox"/> BAL Assessment or <input type="checkbox"/> BAL Contour Map	
<input type="checkbox"/> Bushfire Management Plan or <input type="checkbox"/> Bushfire Management Statement	



Greater Bunbury Region Scheme Form 1 Application for Planning Approval



Owner/s details

Registered proprietor/s (landowner/s) or the authorised agent's details **must** be provided in this section. If there are more than two landowners please provide all relevant information on a separate page. Signature/s must be provided by all registered proprietors or by an authorised agent. **Alternatively**, a letter of consent, which is signed by all registered proprietors or by the authorised agent, can be provided.

Full name Geoffrey Thomas Pearson

Company/agency (if applicable)

ACN/ABN (if applicable)

Postal address Lot 43 Ditchingham Place

Town/suburb Australind

Postcode 6233

The landowner/s or authorised agent consents to the applicant submitting this application

Signature

Please refer to the separate letter of authority signed 9/4/2018

Date

Print name and position

(if signing on behalf of a company or agency)

Applicant details

Name/company B&J Catalano Pty Ltd

Contact person Peter Bennett

Postal address South Western Hwy

Town/suburb Brunswick Junction

Postcode 6224

Fax Email peterbennett@catalano.com.au

Applicant signature

Peter Bennett

Date 3/5/18

Print name and position

Manager Optimisation & Compliance

(if signing on behalf of a company or agency)

Property details

Certificate of title description of land:

Lot No 4

Location No

Plan or Diagram 15419

Vol 1884

Folio 210

Certificate of title description of land:

Lot No 5

Location No

Plan or Diagram 15419

Vol 1884

Folio 211

Title encumbrances (e.g. easements, restrictive covenants)

Locality of development (house no., street name, suburb, etc) Ludlow Road, Myalup

Nearest street intersection

Existing building/land use

Extractive Industry/ Pasture Farming

Description of proposed development and/or use

Limestone Extraction

Nature of any existing buildings and/or use

Approximate cost of proposed development (excl. gst) \$

0 - no infrastructure

Estimated time of completion

2023

Is the development within a designated bushfire prone area? Y/N

If yes, please identify and address the bushfire risk (e.g. by including a BAL assessment(s) or BAL Contour Map and a Bushfire Management Plan with the application). Alternatively a short statement justifying why SPP 3.7 does not apply should be included with the application.

Office use only

Acceptance Officer's Initials

Date Received

Local government reference No.

Commission reference No.

The information and plans provided with this application may be made available by the WAPC for public viewing in connection with the application.

APPENDIX 2

WATER MANAGEMENT PLAN

Please refer to the latest version of this report in the Preliminary Documentation
'Additional Information Report (Rev B) Additional Information Request, Lots 4 and 5
Ludlow Road, Myalup, WA March 2020'.

APPENDIX 3
VEGETATION VALUES SURVEY REPORT 2018



LUNDSTROM ENVIRONMENTAL CONSULTANTS PTY LTD

ACN 600 398 945

21 Sellen Court
LEEMING WA 6149

Mobile: 0417934863
email: mikelund1@bigpond.com
www.Lundstrom-Environmental.com.au

FLORA AND VEGETATION ENVIRONMENTAL VALUES SURVEY

**Prepared for B & J Catalano Pty Ltd
Lot 4 Ludlow Road, Myalup
Shire of Harvey**

1. INTRODUCTION

The purpose of this environmental values survey (flora and vegetation) is to support an extractive industry license (EIL) by proponent B & J Catalano Pty Ltd for Lots 4 and 5 Ludlow Road, Myalup.

This report documents the outcomes from an assessment of the flora and vegetation values of Lots 4 and 5 Ludlow Road, based on a desktop review and reconnaissance survey conducted on 19th April 2018.

Lots 4 and 5 Ludlow Road are located within the Shire of Harvey (Figure 1). The particular area that has been reviewed and surveyed is within the uncleared portions of Lots 4 and 5 and will be referred herein as the assessment area.

2. DESKTOP STUDY/BACKGROUND

2.1 APPROACH

The desktop review collected background information on the assessment, including flora and vegetation that may be present. This involved a search of the literature, public data, aerial imagery and maps of the physical and biological characteristics of the assessment area. This included analysis of the following resources:

- NatureMap (Department of Biodiversity, Conservation and Attractions, DBCA);
- DBCA Threatened Flora Database;
- DBCA Threatened Ecological Community Database;
- Florabase (Western Australian Herbarium);
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) List of Threatened Flora;
- EPBC Act List of Threatened Ecological Communities;
- EPBC Act Protected Matters Search Tool (Department of Environment and Energy, DoEE);
- Western Australian Local Government Association, Environmental Planning Tool (EPT); and
- Previous studies in the vicinity (i.e. Maunsell 2007 etc.).

Refer to Appendix 1 for definitions of Declared Rare and Priority ratings under the *Wildlife Conservation Act 1950* (WC Act).

2.2 BACKGROUND

Landuse/disturbance history

Mining for limestone and road base has occurred within Lots 4 and 5 over the last 20 years. Prior to this the site was used for grazing.

Geology, landform and soils

The assessment area is within the Swan Coastal Plain, which is characterised as a low-lying coastal plain, often swampy, with sand hills consisting mainly sandy, yellow soils (Beard 1990).

The soils of the assessment area are mapped within the Perth Coastal Soil Landscape Zone (211), which is described as coastal sand dunes of calcareous and siliceous sands and calcarenite, of late Pleistocene to Recent age (Purdie et al 2004). The Perth Coastal soil landscape is further divided into subsystems, of which the assessment area sits within the Spearwood S1a Phase (211Sp_S1a) subsystem. The Spearwood S1a subsystem is described as dune ridges with shallow to moderately deep siliceous yellow-brown sands, very common limestone outcrop and slopes up to 15% (Purdie et al 2004).

Acid Sulphate Soil

A search of the Acid Sulphate Soil (ASS) risk map for the Swan Coastal Plain identified no risk from ASS within the assessment area. The nearby Lake Preston (and approximately 100m buffer) is considered a high to moderate risk of ASS occurring within 3m of natural soil surface (Acid Sulphate Soil Risk Map, Swan Coastal Plain, DWER-055).

Hydrology

The assessment site is located with the Harvey Diversion Catchment of the Harvey River Basin. Surface water runoff from the assessment area currently runs into Lake Preston (Hydrographic Catchments – Subcatchments, DWER-030).

Wetlands

There are no geomorphic wetlands mapped within the assessment area. Lake Preston (approximately 500m west of assessment area) is mapped as a conservation category lake/wetland, and there are numerous multiple use category damplands approximately 2.5-3km east of the assessment area, running parallel to Lake Preston (Geomorphic Wetlands, Swan Coastal Plain, DBCA-019).

There is no Ramsar Site within the assessment area. Lake Preston, which is approximately 500m west of the survey area, is part of the “Peel – Yalgorup System” (Ref 36) Ramsar wetland (Ramsar Sites, DBCA-010). This wetland covers an area of approximately 26,500ha and comprises of a large system of shallow estuary and saline, brackish and freshwater lakes. Many tens of thousands of waterbirds, including large numbers of migrant shorebirds from the northern hemisphere, use the estuary and lakes each year (RIS 2003).

Environmentally Sensitive Areas

An Environmentally Sensitive Area (ESA) is an area where the vegetation has high conservation value and cannot be cleared. ESAs are declared by the Minister in the Environmental Protection (Environmentally Sensitive Areas) Notice 55 (2005) under section 51B of the Environmental Protection Act 1986.

There is no ESA within the assessment area. Lake Preston is listed as an ESA, and is located approximately 500m from the assessment area.

Vegetation

At a state level, the assessment area is situated in the Southwest Botanical Province of Western Australia (Beard 1990), and within the Swan Coastal Plain bioregion (Perth subregion) as described by the Interim Biogeographic Region of Western Australia (IBRA; DoEE 2018).

The Perth subregion (SWA2) is composed of colluvial and aeolian sands, alluvial river flats, and coastal limestone. It comprises of Heath and/or Tuart woodlands on limestone, Banksia and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, and Marri on colluvial and alluvials and also includes a complex series of seasonal wetlands (Mitchell et al. 2002).

At a regional level, the assessment area occurs within the Cottesloe-Central and South vegetation complex which is described as a mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops.

The Cottesloe Complex-Central and South has 32.2% of the pre-European extent remaining on the Swan Coastal Plain and 41.8% remaining within the Shire of Harvey (DBCA 2017) (Table 1).

The objective of the EPA-endorsed Natural Area Strategy is to achieve a standard level of native vegetation retention of at least 30% of the pre-clearing extent of the ecological communities on the Swan Coastal Plain (EPA 2003). As there is slightly more than 30% of the Cottesloe Complex-Central and South remaining on the Swan Coastal Plain, this complex is meeting this objective.

Conservation Significant Vegetation

No DBCA listed Threatened Ecological Communities (TECs) have been previously recorded within the assessment area. The closest recorded TEC is approximately 2km north of Lot 4 (Threatened Ecological Communities, DBCA-038).

According to a map of potential EPBC Act listed TECs, *Banksia Woodlands of the Swan Coastal Plain* may occur within the assessment area (DoEE 2018).

The assessment area is not within the Bush Forever mapping area (Bush Forever Areas 2000, DOP-071).

The assessment area lies within a Tuart Woodlands, as mapped by CALM (2003) in the "Tuart Atlas", which maps and assesses data on tuart occurrence, overstory density and understory condition on the Swan Coastal Plain. The Atlas has classified the tuart woodland polygon within the assessment area as 10-19% canopy density and classified the visible native understory condition as highly disturbed.

Table 1. Pre-European and Current Extent of the Cottesloe Vegetation Complex – Central and South, within the Swan Coastal Plan and the Shire of Harvey (Source: DBCA 2017).

Area	Vegetation Complex	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	Current extent in all DBCA managed land* (ha)	Current % remaining within DBCA managed land* (%)	Proportion of the Vegetation Complex within Shire of Harvey (%)
Swan Coastal Plain	Cottesloe Complex-Central and South	45299.6	14571.4	32.2	6591.8	14.6	-
Shire of Harvey	Cottesloe Complex-Central and South	1,332.7	557.6	41.8	-	-	2.9

* Excludes Crown Freehold Department Managed Lands that are managed under Section 8A of the CALM Act.

Flora

Database searches of NatureMap, the DBCA and the WA Herbarium Threatened Flora Databases were undertaken to determine whether any Threatened or Priority flora species are known from within a 5km radius of the assessment area. The literature review and database searches identified 13 conservation significant species with the potential to occur within proximity of the assessment area (1 Threatened Flora and 12 Priority Flora). The likelihood of each conservation significant species occurring within the Survey Area is summarised in Table 2.

Conservation Significant Flora

No Threatened and/or Priority Flora have been previously recorded within the assessment area. Priority flora (P3) were recorded approximately 1km north and 2km north east of the assessment area (Threatened and Priority Flora, DBCA-036).

Table 2. Vascular plant species recorded within the assessment area.

Species	WC Act/DBCA listing	Description (Source: Florabase)	Potential to occur (soil type/habitat within area)
<i>Alyogyne</i> sp. Rockingham (G.J. Keighery 14463)	P2	Shrubs (with a sparse to dense indumentum)	unlikely
<i>Blennospora doliiformis</i>	P3	Erect annual, herb, to 0.15 m high. Fl. yellow, Oct to Nov. Grey or red clay soils over ironstone. Seasonally-wet flats.	unlikely
<i>Conostylis pauciflora</i> subsp. <i>pauciflora</i>	P4	Rhizomatous, stoloniferous perennial, grass-like or herb, 0.1-0.35 m high. Fl. yellow, Aug to Oct. Grey sand, limestone. Hillslopes, consolidated dunes.	possible
<i>Diuris micrantha</i>	T	Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow & brown, Sep to Oct. Brown loamy clay. Winter-wet swamps, in shallow water.	unlikely
<i>Haloragis aculeolata</i>	P2	Slender, erect perennial, herb, to 0.4 m high. Fl. green, Sep or Dec. Black sand or clay over limestone. Winter-wet areas.	unlikely
<i>Haloragis scoparia</i>	P1	Perennial, herb, 0.3-0.6 m high.	unlikely
<i>Hibbertia spicata</i> subsp. <i>leptotheca</i>	P3	Erect or spreading shrub, 0.2-0.5 m high. Fl. yellow, Jul to Oct. Sand. Near-coastal limestone ridges, outcrops & cliffs.	unlikely
<i>Lasiopetalum membranaceum</i>	P3	Shrub. Stems hairy. Leaves 30-50 mm long, 14-40 mm wide. Calyx pink, blue or purple, 5.5-7 mm long, the lobes fused less than half their length. Flowering time September - December. Distribution Botanical Province South-West, IBRA Bioregion Swan Coastal Plain, Jarrah Forest or Warren.	unlikely

Species	WC Act/DBCA listing	Description (Source: Florabase)	Potential to occur (soil type/habitat within area)
<i>Pimelea calcicola</i>	P3	Erect to spreading shrub, 0.2-1 m high. Fl. pink, Sep to Nov. Sand. Coastal limestone ridges.	unlikely
<i>Pterostylis frenchii</i>	P2	Tuberous, herb, to 0.35 m high, with rosette leaves. Calcareous sand with limestone, laterite. Flatlands and gentle slopes.	possible
<i>Sphaerolobium calcicola</i>	P3	Slender, multi-stemmed, scandent or erect shrub, to 1.5 m high. Fl. orange-red, Jun or Sep to Nov. White-grey-brown sand, sandy clay over limestone, black peaty sandy clay. Tall dunes, winter-wet flats, interdunal swamps, low-lying areas.	unlikely
<i>Stylidium longitubum</i> (Jumping Jacks)	P4	Erect annual (ephemeral), herb, 0.05-0.12 m high. Fl. pink, Oct to Dec. Sandy clay, clay. Seasonal wetlands.	unlikely
<i>Stylidium maritimum</i>	P3	Caespitose perennial, herb, 0.3-0.7 m high, Leaves tufted, linear to narrowly oblanceolate, 10-40 cm long, 1-5.5 mm wide, apex acute to mucronate, margin involute, glabrous. Fl. white/purple, Sep to Nov. Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.	unlikely

3. RECONNAISSANCE SURVEY

A reconnaissance survey was undertaken to verify the information obtained from the desktop assessment, to briefly characterize the flora, and to describe the vegetation and its general condition within the assessment area.

3.1 APPROACH

A site visit was undertaken by Lundstrom Environmental Consultants Pty Ltd 19 April 2018, where a selective, low intensity survey of the flora and vegetation was undertaken to describe the general vegetation characteristics and conditions at an appropriate scale.

The entire area was traversed systematically to obtain an appropriate environmental assessment of the assessment area. The following information was recorded when vegetation changed or when a new or uncommon species was observed:

- GPS coordinates and photo reference points;
- Plant species and their abundance;
- Notes on vegetation structure using the method of Muir (1977);
- Vegetation condition score (Keighery, 1994 – Appendix 2); and
- Surface soil texture and condition.

3.2 FINDINGS

VEGETATION

Vegetation type

Two vegetation types were recorded within the assessment area:

- Vegetation Type 01: Open woodlands of *Eucalyptus gomphocephala*, *Eucalyptus decipiens* and *Agonis flexuosa* over very occasional *Kunzea ericifolia*, pasture grasses and various weeds, predominately *Gomphocarpus fruiticosus* and *Solanum linneanum* in grey sands with occasional limestone outcrops. This vegetation type is present in the southern section of the assessment area, predominantly the portion of the assessment area within Lot 5.
- Vegetation Type 02: Closed low woodland of *Eucalyptus decipiens*, *Eucalyptus petrensis*, *Agonis flexuosa*, and isolated *Banksia attenuata*, and *Nuytsia floribunda* over *Melaleuca viminea* and *Templetonia retusa* and occasional *Rhagodia baccata* and *Hardenbergia comptoniana* on grey sands with numerous limestone outcrops. This vegetation type is predominately on either side of the ridge within the assessment area, which runs in a north-south direction through the portion of the assessment area within Lot 4.

Conservation significance

No Threatened or Priority Ecological Communities were identified within the assessment area.

The site has been mapped by CALM (2003) as a Tuart woodland. Tuart trees were present, but not in large numbers. The highest abundance of tuarts was southern portion of Lot 5 where there were a number of large individuals (i.e. greater than 20-30m).

The site was also mapped as an area that may contain *Banksia Woodlands of the Swan Coastal Plain*, however only isolated *Banksia attenuata* individuals were recorded throughout the assessment site.

Vegetation condition

According to the vegetation condition scale described in Keighery (1994, Appendix 2) the assessment area varies from “Completely Degraded” to “Good”. In general, the vegetation condition was partially degraded, with degrees of variation depending on the vegetation type.:

- Vegetation type 01 (Open woodlands of various *Eucalyptus gomphocephala*, *Eucalyptus decipiens* and *Agonis flexuosa*) is considered “Degraded” to “Completely Degraded”. This vegetation type was obviously cleared for grazing, with only tree (and the occasional tall shrub) species found in this area over various weeds. There is no native mid or lower stratum and weeds dominate the ground level. The mature Eucalypt and Agonis trees are in very good condition and in some cases there are large individuals present.
- Vegetation type 02 (Closed low woodland of *Eucalyptus decipiens*, *Eucalyptus petrensis* and *Agonis flexuosa*) is considered “Good” to “Degraded”. This vegetation type is higher on the ridge with numerous limestone outcrops throughout, which has made the site less attractive for grazing. The site has an upper stratum and a limited mid stratum (2-3 species), which is dense in most parts. There is no native lower stratum and weed species dominate the ground level.

There was no evidence of dieback infestations at the site based on the apparent health of dieback susceptible species (i.e *Banksia* species)

FLORA

Number of taxa

A total of 16 vascular flora species were recorded within the assessment area. The full list of species recorded and the vegetation types they represented is present in Table 3.

Conservation status

No Threatened or conservation significant flora, as listed under the EPBC Act or the WC Act, or listed by the DBCA as Priority flora were recorded within the assessment area.

Significant trees

There were a number of very wide *Agonis flexuosa* trees scattered within the southern portion of the assessment area (Lot 5). Lot 5 also contained a number of large *Eucalypt gomphocephala* scattered throughout.

Weed species

Four weed species were recorded within the assessment area, of which *Gomphocarpus fruticosus* (narrow leaf cottonbush) and *Solanaum linneanum* (apple of Sodom) are listed as Declared Plant species in Western Australia pursuant to Section 22 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act).

Table 3: List of Plant Species Recorded on Site

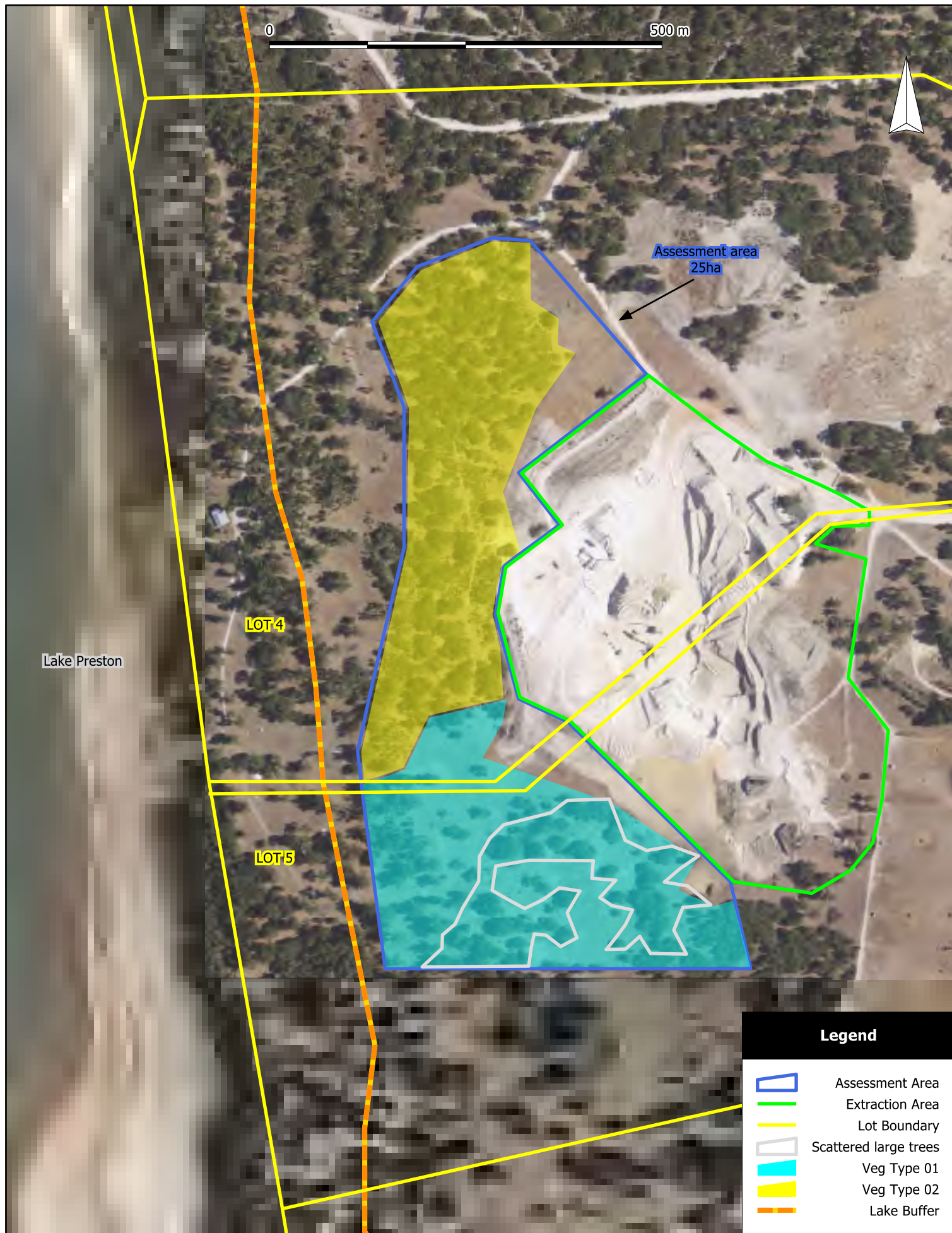
Species	Structure	Type 01	Type 02
<i>Agonis flexuosa</i>	Tree	x	x
<i>Eucalyptus gomphocephala</i>	Tree	x	x
<i>Eucalyptus decipiens</i>	Tree		x
<i>Eucalyptus petrensis</i>	Tree		x
<i>Banksia attenuata</i>	Tree		x
<i>Nuytsia floribunda</i>	Tree		x
<i>Hakea prostrata</i>	Tree/Shrub	x	x
<i>Melaleuca viminea</i>	Shrub	x	x
<i>Templetonia retusa</i>	Shrub		x
<i>Kunzea ericifolia</i>	Shrub		x
<i>Rhagodia baccata</i>	Shrub		x
<i>Hardenbergia comptoniana</i>	Climber		x
<i>Gomphocarpus fruticosus</i>	Weed	x	x
<i>Solanaum linneanum</i>	Weed	x	x
<i>Ehrharta calycina</i>	Weed	x	
<i>Hypochaeris glabra</i>	Weed		x

4. DISCUSSION

The area has been subjected to selective clearing and grazing in the past, however there are some large trees recorded, in particular individual *Eucalyptus gomphocephala* and *Agonis flexuosa* within Lot 5. The vegetation quality is generally degraded with no native ground cover and a prevalence of weed species. The vegetation type on the ridge (Lot 4) is in better condition than the portion of the assessment area within Lot 5.

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Lundstrom Environmental Consultants Pty Ltd

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Mob 0417934863
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Scale: 1:6100
Original Size: A4
Air Photo Date: Landgate February 2012
Datum: Australian Geocentric 1994 (GDA94)

B & J Catalano Pty Ltd
Lots 4 & 5 Ludlow Rd, Myalup
Limestone Extraction

Assessment Area

Figure 1

Photos



Large *Agonis flexuosa* in southern portion (Lot 5)



Large tuart (*Eucalyptus gomphocephala*) in southern portion (Lot 5)

Vegetation Type 01



Vegetation Type 02



Appendix 1

Categories of Threatened Flora Species (*Environment Protection and Biodiversity Conservation Act 1999*)

Conservation Code	Category
	Extinct
Ex	Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
	Extinct in the Wild
ExW	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.
	Critically Endangered
CE	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.
	Endangered
E	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.
	Vulnerable
V	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.
	Conservation Dependent
CD	Taxa which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

APPENDIX 2

Vegetation Condition scale (Keighery 1994)

Score	Condition	Definition
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.

APPENDIX 4

FAUNA ASSESSMENT **2018**

Please refer to the latest version of this report in the Preliminary Documentation 'Additional Information Report (Rev B) Additional Information Request, Lots 4 and 5 Ludlow Road, Myalup, WA March 2020'.

APPENDIX 5

WEED MANAGEMENT PLAN

Please refer to the latest version of this report in the Preliminary Documentation 'Additional Information Report (Rev B) Additional Information Request, Lots 4 and 5 Ludlow Road, Myalup, WA March 2020'.

APPENDIX 6
AHIS ABORIGINAL HERITAGE SITE SEARCH REPORT

List of Registered Aboriginal Sites

Search Criteria

No Registered Aboriginal Sites in Lot on Survey - Lot 5 on Plan or Deposited Plan 15419

Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Planning, Lands and Heritage by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at heritageenquiries@dplh.wa.gov.au and we will make every effort to rectify it as soon as possible.

South West Settlement ILUA Disclaimer

Your heritage enquiry is on land **within or adjacent to** the following Indigenous Land Use Agreement(s): Gnaala Karla Booja People ILUA.

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The ILUAs bind the parties (including 'the State', which encompasses all State Government Departments and certain State Government agencies) to enter into a Noongar Standard Heritage Agreement (NSHA) when conducting Aboriginal Heritage Surveys in the ILUA areas, unless they have an existing heritage agreement. It is also intended that other State agencies and instrumentalities enter into the NSHA when conducting Aboriginal Heritage Surveys in the ILUA areas. It is recommended a NSHA is entered into, and an 'Activity Notice' issued under the NSHA, if there is a risk that an activity will 'impact' (i.e. by excavating, damaging, destroying or altering in any way) an Aboriginal heritage site. The Aboriginal Heritage Due Diligence Guidelines, which are referenced by the NSHA, provide guidance on how to assess the potential risk to Aboriginal heritage.

Likewise, from 8 June 2015 the Department of Mines, Industry Regulation and Safety (DMIRS) in granting Mineral, Petroleum and related Access Authority tenures within the South West Settlement ILUA areas, will place a condition on these tenures requiring a heritage agreement or a NSHA before any rights can be exercised.

If you are a State Government Department, Agency or Instrumentality, or have a heritage condition placed on your mineral or petroleum title by DMIRS, you should seek advice as to the requirement to use the NSHA for your proposed activity. The full ILUA documents, maps of the ILUA areas and the NSHA template can be found at <https://www.dpc.wa.gov.au/swnts/South-West-Native-Title-Settlement/Pages/default.aspx>.

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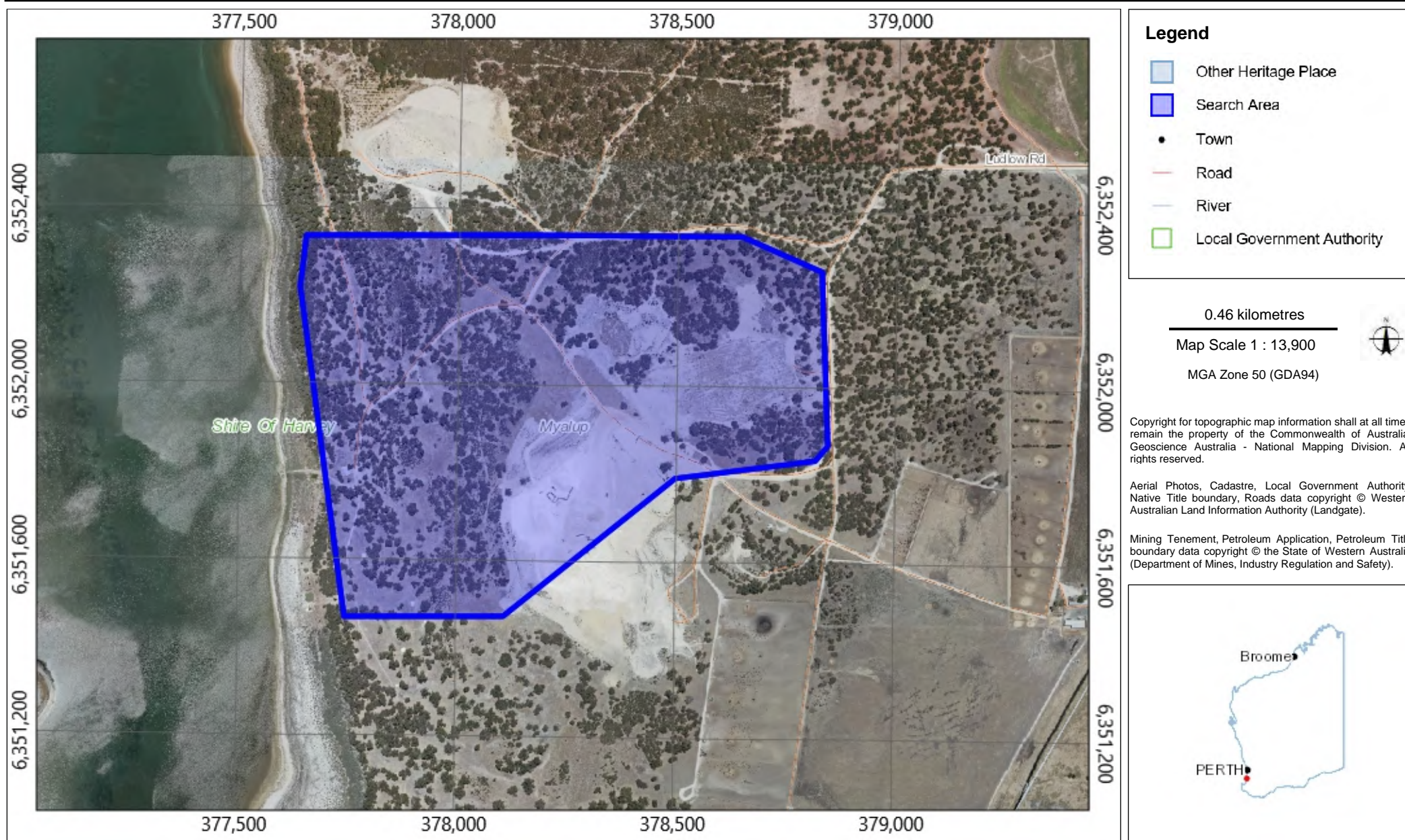
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Aboriginal Heritage Inquiry System

Map of Other Heritage Places

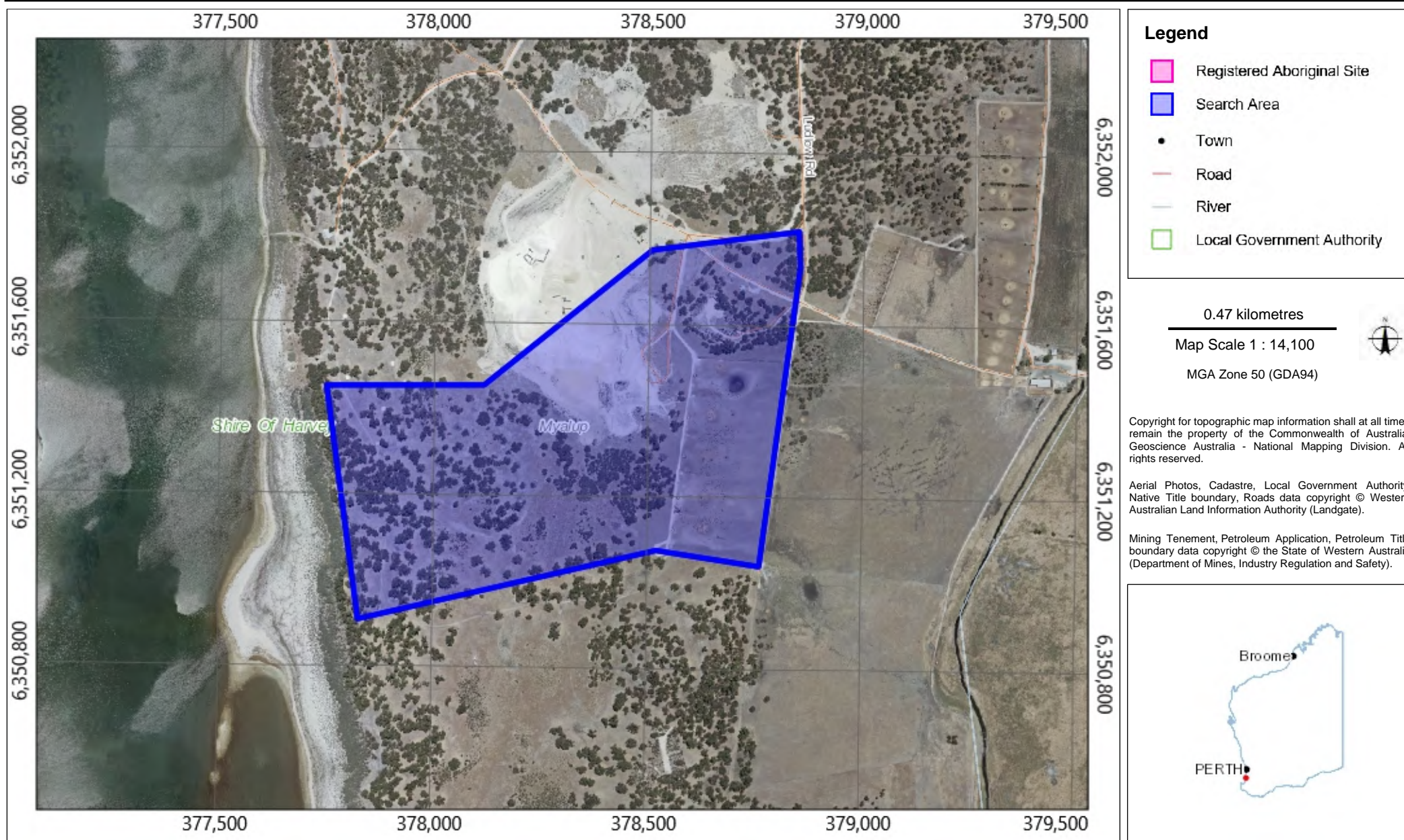
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Map of Registered Aboriginal Sites

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