

R1249 Rev 0

August 2019

Mid West Sands

**Southgate Dunes
Management & Decommissioning Plan
(2019 to 2024)**

marinas

boat harbours

canals

breakwaters

jetties

seawalls

dredging

reclamation

climate change

waves

currents

tides

flood levels

water quality

siltation

erosion

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1. Background

Mid West Sands currently extract sand from the Southgate dunes, located approximately 7 km south of Geraldton town centre along Brand Highway. The location of Southgate dunes is shown in Figure 1.1.



Figure 1.1 Southgate Dunes Location (Nearmap 30 March 2019)

Current sand extraction operations of the Southgate dunes are focussed within Lot 2453, Cape Burney and involve the removal of sand for a range of agricultural and industrial uses. The volume of sand extracted is dictated by demand from farmers and other users and therefore varies from year to year.

Sand extraction activities by Mid West Sands have helped to manage the northwards movement of the Southgate dunes, which is threatening Brand Highway and residential properties in the area (further details are provided in the following Section 2).

On 13 September 2016 following a special Council meeting, Mid West Sands were granted conditional Development Approval (TP16/150) to continue and expand sand extraction within Lot 2453. This included expanding the existing 2015 operations to the eastern flank of the lot, focusing on a large, untouched sand dune front moving towards Brand Highway.

Subsequent applications for the renewal of Development Approval (TP16/150) were presented to Council on 26 September 2017 and 25 September 2018 and granted for one year on both occasions. The previously granted 12 month Development Approval is valid until 13 September 2019 and again requires renewal prior to expiry.

The 2018/2019 approved extraction area is detailed in the M P Rogers and Associates Pty Ltd (MRA) report *Southgate Dunes Management and Decommissioning Plan R784 Rev 4* (MRA 2018).

Mid West Sands are currently proposing to continue and expand sand extraction within Lot 2453 and engaged MRA to update this Management and Decommissioning plan and apply for the relevant approvals.

The Development Approval (TP16/150) issued to Mid West Sands in 2016, and subsequent renewals, are subject to 10 conditions by the City of Greater Geraldton (City). Advice from the City confirms that Conditions 4 and 6 relating to the Transport Assessment and demarcation of the extraction area (respectively) have been complied with to the satisfaction of the City. The remaining Conditions (No's 1, 2, 3, 5, 7, 8, 9, & 10) have been complied with since the previous approval, however are ongoing and need to be adhered to for the duration of the sand extraction operations.

It is noted that Condition 10 of the Development Approval (TP16/150) refers to the extraction volume of limesand in cubic meters (m^3). In order to track the volume of extracted limesand, Mid West Sands utilise registered weight meters to record the quantities (tonnes) of limesand that are removed from the extraction area as a result of their operations. The typical density of extracted sand has historically been assumed to be 1.53 tonnes/ m^3 . Therefore, the agreed conversion factor from m^3 to tonnes has been 1.53 (110,000 m^3 equals approximately 168,000 tonnes). To be consistent with Mid West Sands' record keeping methodology, quantities of limesand are given in tonnes for the remainder of this report.

Mid West Sands is requesting an extension to the existing extraction area (further south within Lot 2453) to access cleaner sand and enable the quantities forecasted for limesand demand to be achieved. Mid West Sands' sand extraction operations are outlined in Sections 3.1 to 3.4 and the proposed extraction details are provided in Section 3.5. Consideration of the effects of the continued and expanded sand extraction proposed are also discussed in Section 3.5 with reference the historical sediment movement and previous studies completed (Section 2).

For convenience of both parties, Mid West Sands seek to apply for a 5 year Development Approval (13 September 2019 to 13 September 2024 inclusive) for the continued and expanded sand extraction within Lot 2453 of the Southgate Dunes.

To accommodate for years of increased demand for limesand, rather than the restriction of an upper extraction limit of 168,000 tonnes of limesand in any given year, Mid West Sands requests the City to consider a long-term average approach. Essentially, any quantity of limesand that is extracted under the limit of 168,000 tonnes/yr could be carried forward to the following year/s. This approach would still ensure that the net quantity of limesand extracted would not exceed the limit 168,000 tonnes/yr currently in affect. This Management Plan for the continued and expanded extraction operations within Lot 2453 provides the following details, as required under the City's Extractive Industry Local Planning Policy (EILPP):

- Review of the historical movement of the Southgate dunes.
- Plans showing the location of existing and proposed extraction activities and site details.
- Details of the current and proposed sand extraction methodology.
- Consideration of the effects of the proposed sand extraction operations.
- A rehabilitation and decommissioning plan.
- An outline of the benefits to the community.

2. Sediment Transport

The area known as the Southgate dunes system is essentially a large mobile sand sheet that is migrating in a northerly direction through the action of the prevailing southerly winds. The dunes were originally formed by sand blowing north from the beach adjacent to the Greenough River mouth (Short 2006). Figure 2.1 shows the position of the dune in 1942, 1975 and 2012 and illustrates the northerly migration of the dune system.

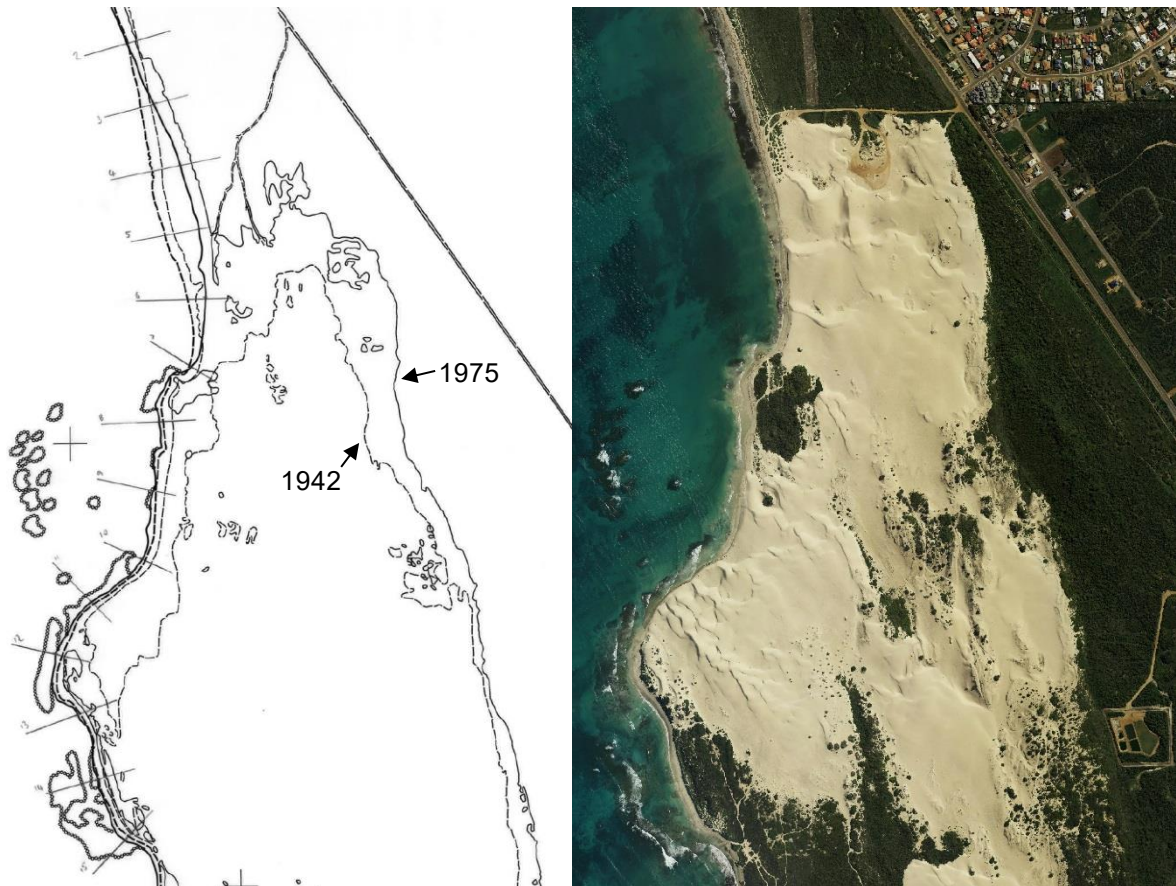


Figure 2.1 Extent of Southgate Dunes in 1942, 1975 (Left) and 2012 (Right)

A number of studies and investigations have been completed on the Southgate dunes in order to quantify the contribution of sediment from the Southgate dune system into the littoral system of the Tarcoola Embayment. An important part of these studies has been to define movements that occur in different areas of the dune system. To provide context to the following sections of this report, the nomenclature adopted in reference to these different areas, as well as the location of Lot 2453, is outlined in Figure 2.2.

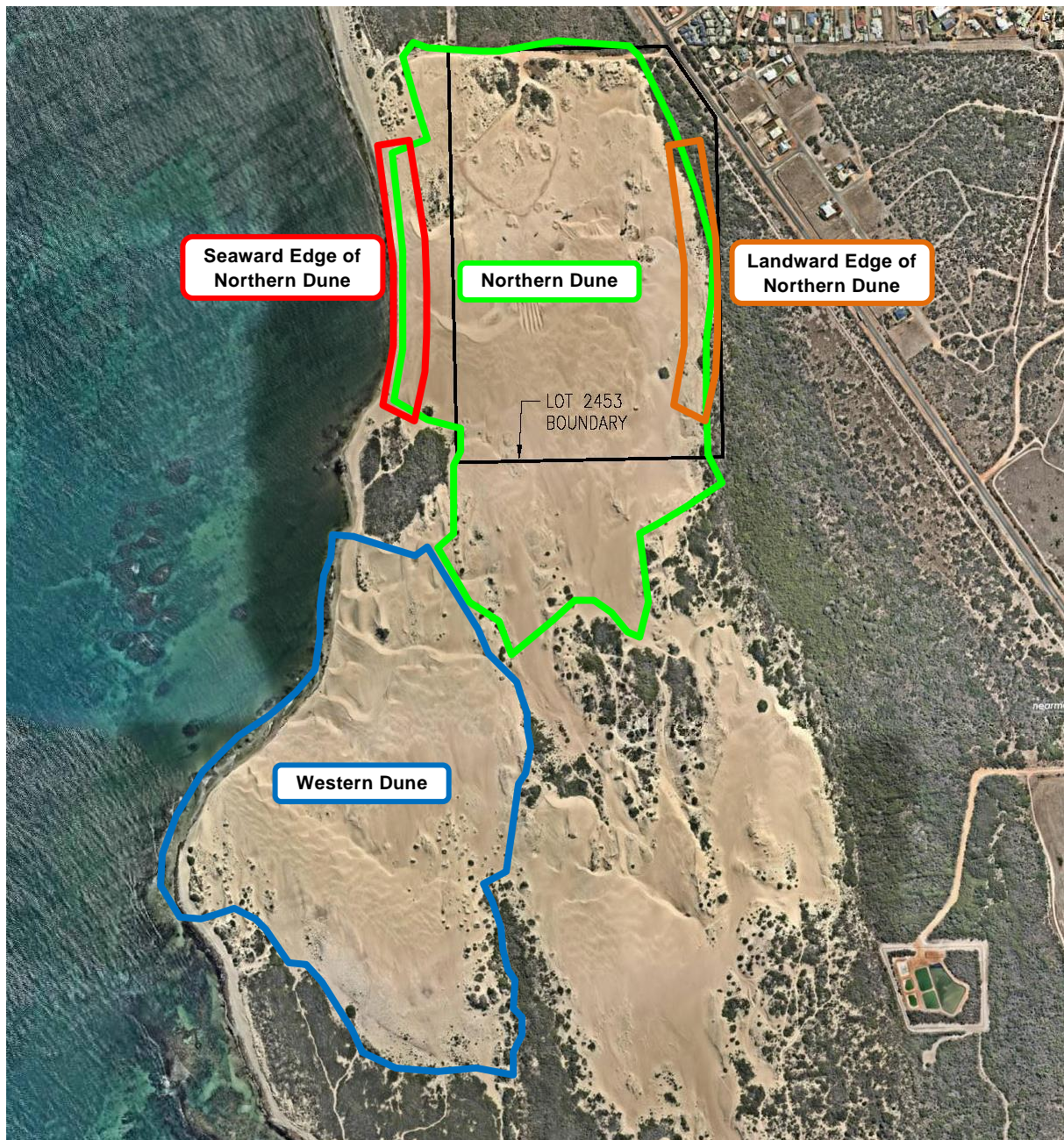


Figure 2.2 Nomenclature Adopted for Southgate Dune System

In 1991 the Department of Planning and Urban Development (DPUD 1991) presented the results from a study of the Southgate dunes. The study estimated the contribution of the Southgate dunes to the littoral sediment budget by completing a study into the changes in volume of sediment stored in the dune between 1969 and 1990. The study concluded the following:

- The Southgate dune system had been migrating northwards at a rate of around 10 m/yr.
- The Western Dune feeds an estimated 34,000 m³/yr into the littoral system.
- The seaward edge of the Northern Dune is not estimated to feed the littoral system.

Specialist coastal engineers, MRA, completed further studies of the Southgate dunes system in 2012 and 2013 as part of the approvals process for the proposed development of the area by the landholder Bayform Holdings. Details of these studies are provided in the report *Southgate Dunes – Sediment Feed Analysis* (MRA 2013).

The studies completed by MRA involved the following:

- Assessment of the dune migration, based on orthorectified aerial imagery between 2001 and 2010.
- Analysis of the observed (2001 to 2010) and prevailing wind conditions.
- Assessment of the topography generated using photogrammetric mapping techniques between 2007 and 2012.

The results of these studies completed by MRA were generally similar with the previous DPUD (1991) study and concluded the following:

- The Southgate dune system migrated northwards at a rate of around 10 m/yr between 2001 and 2010.
- The volume of feed from the Western Dune to the littoral system is estimated to be in the order of 31,000 to 37,800 m³/yr.
- The estimated volume of feed from the seaward edge of the Northern Dune to the littoral system may be between 3,000 and 5,000 m³/yr.

The above volumes of feed estimated from the Southgate dune system into the littoral system are illustrated in the following Figure 2.3. The Lot 2453 boundary is also shown in the figure to provide context for later sections of this report.

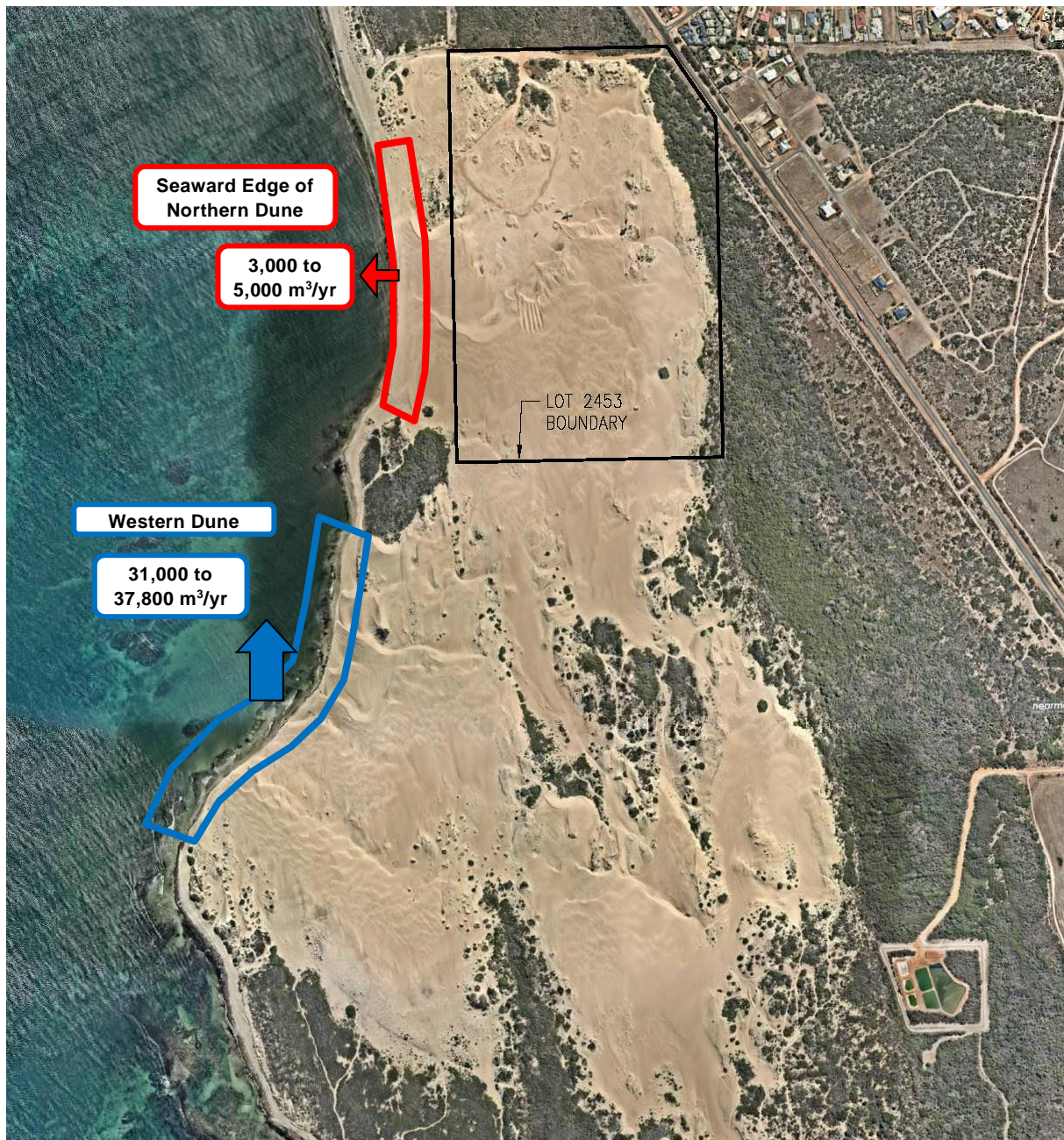


Figure 2.3 Summary of Estimated Sand Feed Volumes (MRA 2013)

Based on the estimated quantities, the volume of feed from the seaward edge of the Northern Dune equates to around 10% of the total estimated sediment feed into the littoral system.

Mid West Sands have been extracting sand from the northern area of Southgate dunes for a number of years. In the period from 2009 to 2013 Mid West Sands extracted between 65,000 and 128,000 tonnes/yr from the area. Between 2014 and 2015, the sand extraction quantity was approximately 150,000 tonnes/yr. The recorded quantities of sand extracted in the recent calendar years, since the commencement of recording by the City, are presented in the following table.

Table 2.1 Historical Limesand Extraction Quantities

Calendar Year	Estimated Volumes (m ³)	Recorded Quantities (tonnes)
2017	97,000	148,660
2018	77,000	117,392

Figure 2.4 shows the position of the vegetation line in 2001, 2010, 2012, 2015 and 2019 as well as the approximate extent of Mid West Sands’ sand extraction area pre 2016.

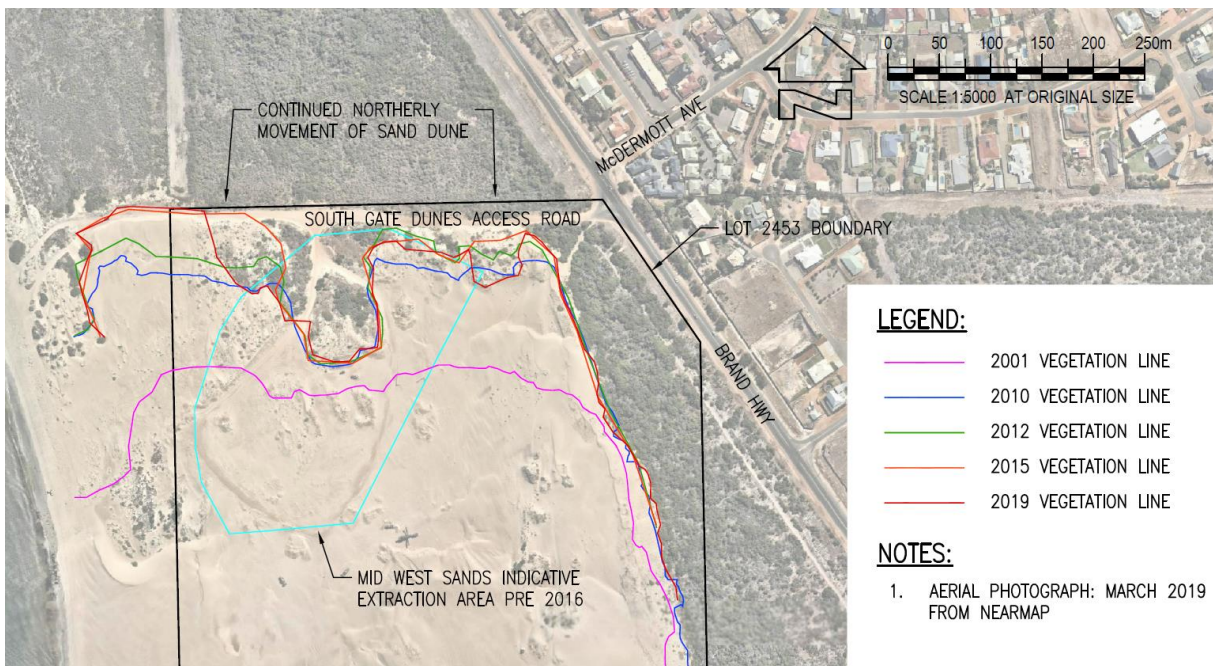


Figure 2.4 Sand Extraction Area (Pre 2016) & Historical Sand Dune Movement

The vegetation line positions, shown in Figure 2.4, helped to identify that the dune front to the east and west of the pre 2016 extraction area would continue to move north at a rate of around 5 to 10 m/yr, covering parts of the Southgate Dunes Access Road unless the extraction area was expanded. Since the expansion of the extraction area in 2016, sand movement has been halted at the edge of the access road, with Mid West Sands removing sand off the access road as required to maintain the road. Since the beginning of 2017 (the commencement of recording by the City), Mid West Sands has removed 47,051 tonnes from the Southgate Dunes Access Road in order to maintain public access.

It is important to note that the movement of the dune front is highly dynamic. On-site experience suggests that the dune front can move up to 10 m in a matter of months depending on the prevailing winds and level of the dunes (pers com Doug Wilson, Mid West Sands 31/7/17).

The dune front is likely to continue moving to the north at around 5 to 10 m/yr unless sand is removed from this area. Without management, the dune front could start significantly impacting Brand Highway within 10 years. Therefore, the continued extraction of the Southgate dunes would benefit both the City and the broader community.

3. Extraction Operations

3.1 Site Boundary

To ensure that extraction operations are always within the approved area, Mid West Sands currently use large concrete blocks and wooden stakes as boundary markers. These are shown in Figures 3.1 to 3.4 below and marked on the Extraction Plan in Appendix A. The markers are located 20 m inside the Lot 2453 boundary and mark the area currently (2018/19) approved for extraction. Mid West Sands propose to continue using these markers to aid compliance with the current and proposed extraction area.



Figure 3.1 Concrete Block and Wooden Stake Markers 1 (Left) and 2 (Right)



Figure 3.2 Concrete Block Markers 3 (Left) and 4 (Right)



Figure 3.3 Concrete Block Marker 5



Figure 3.4 Wooden Stake Markers 6 (Left) and 7 (Right)

3.2 Access & Constraints

As noted previously, the Southgate dunes are located approximately 7 kms south of the Geraldton town centre. The existing and proposed sand extraction is to occur on Lot 2453, Cape Burney. The lot is accessed from the Southgate Dunes Access Road located off Brand Highway, approximately 50 m south of McDermott Avenue. Mid West Sands plan to retain public access and maintain the portion of the road within Lot 2453 to the satisfaction of the City. The Extraction Plan contained in Appendix A shows the Southgate Dunes Access Road and the lot boundary for the site.

A Registered Aboriginal Heritage site (ID 5287 Southgates Burial Site) is located in the centre of the lot. This site was identified in the Department of Aboriginal Sites (1990) report and is shown on the Extraction Plan in Appendix A. No excavation is proposed within this area.

Contours of the Southgate sand dune were extracted from ortho-imagery as part of MRA's work on the sand dune dynamics (MRA 2013). The 2012 contours are the most recently available data. Given the dynamic nature of the sand dunes, the contours provide an indication of the general ground levels in the dunes, with today's levels likely to be different. The contours are shown in Appendix F.

3.3 Extraction Methodology

Sand is extracted from a number of dune faces using bulldozers and front end loaders. The dune face is generally flattened by the bulldozer with the loader working at the base, as shown in Figure 3.5.



Figure 3.5 Typical Sand Extraction Methodology

If the sand is clean, the loaders are able to place the sand directly into waiting road trains (typically 50 t) with the aid of loading ramps that have been set up on site. If there are no waiting road trains, the sand is stockpiled near the loading ramps.



Figure 3.6 Loading Sand Directly into Waiting Road Trains

When the sand is not clean, due to the presence of dead vegetation, sticks, rocks and general debris, the sand is passed through a screening plant. The typical screening plant is shown in Figure 3.7.

Mid West Sands currently have the capacity to screen approximately 50,000 tonnes/yr (email Doug Wilson, Mid West Sands 3/7/19).



Figure 3.7 Screening Equipment

When required, sand is typically stockpiled close to the ramps or the screen for ease of loading. The screen location and stockpile area are shown in Appendix A.

Dead vegetation that has been covered by the advancing sand sometimes needs to be excavated. The Department of Water and Environment Regulation (DWER) has confirmed that a Purpose Permit is required for the extraction of this dead and buried vegetation (Pers Comm James Widenbar at DER, 21/7/16).

On 25 August 2016, The DER granted a Purpose Permit (7183/1) to Mid West Sands for the clearing of 0.4 hectares of dune vegetation by mechanical removal for the purpose of sand extraction. The Permit is attached in Appendix B and is valid until 24 September 2021. Mid West Sands have complied with the permit to date, however will need to apply for a new Purpose Permit to include the proposed expanded extraction area if granted in a renewed Development Approval.

The sand extraction methodology outlined above is proposed to be used in the future for the approved extraction area detailed in the following sections.

3.4 Mine Site & Traffic Management

Mid West Sands have prepared a Southgates Limesand Extraction Plan (SLEP), which is contained in Appendix C. The SLEP provides details of the safety management and mine site internal signage. All plant operators and truck drivers are inducted prior to being allowed on site. Inductions cover potential safety hazards and risk mitigation, as well as the mine road rules, speed and safety.

The emergency muster point and staff car park area are shown in Figure 3.8 below and labelled on the Extraction Plan contained in Appendix A.



Figure 3.8 Emergency Muster Point and Staff Car Park Area

With regards to public safety, the aim of the SLEP is to keep the public away from mining as much as possible. Signage is placed at the beginning of the Southgate Dunes Access Road, as shown in Figure 3.9. Members of public are directed towards the beach, while trucks are diverted to the loading area.



Figure 3.9 Entrance Signage

Signage along the Southgate Dunes Access Road includes a 30 km/hr speed limit and a “Caution Trucks Entering” sign as shown in Figure 3.10.



Figure 3.10 Signage Along Southgate Dunes Access Road

At the northern entrance to the private lot (Lot 2453), restricted public access signage has been implemented on either side of the Mid West Sands compound access gate which is closed and locked outside mining hours. The signage at the gate is shown in Figure 3.11.



Figure 3.11 Mid West Sands Compound Access Gate Signage

Mid West Sands have also installed and implement the use of four 24 hour surveillance cameras to monitor the compound and its access routes. These cameras, shown below in Figures 3.12 and 3.13, aim to ensure public compliance with the restricted areas.



Figure 3.12 Surveillance at Compound Gate (Left) and Muster Point (Right)



Figure 3.13 Surveillance Along Compound Access Routes

Midwest Sands has been extracting lime sand at Southgate Dunes since 1991, prior to the proclamation of the Mines Safety and Inspection Act (1994). Therefore, the Department of Mines and Petroleum (DMP) have confirmed that the preparation and submission of a Project

Management Plan and approval by the State Mining Engineer is not required at Southgate Dunes (Pers Comm Andrew Harris at DMP, 26/7/16).

Inspectors from the Mines Safety Branch in DMP completed an inspection of the Mid West Sands operations on 18 March 2016 (Pers Comm Andrew Harris at DMP, 26/7/16). The aim of such inspections is to verify compliance with relevant legislation and to promote continuous improvement in work health and safety performance of mine operators. It is noted that this inspection process is not an approval. Mid West Sands implemented a number of operation changes identified during the DMP inspection. This included the submission of an action plan, which included evidence of completion of the identified items and has met the requirements of the DMP (Pers Comm Andrew Harris at DMP, 26/7/16).

In response to Condition 4 of the Development Approval (TP16/150) and requirements outlined by Main Roads WA, Mid West Sands upgraded the intersection between the Southgate Dunes Access Road and Brand Highway. The upgrade was completed in December 2016 and included widening the intersection to provide for the swept path of turning road trains and an 8 m wide, 30 m sealed section at the access road entrance as shown in Figure 3.14.



Figure 3.14 Dune Access Road Intersection Upgrade

Upon inspection, Main Roads WA confirmed that the intersection upgrade completed by Mid West Sands complied with their current requirements as outlined in the correspondence shown in Appendix D.

Mid West Sands predict around 50 to 60 road trains (typically 50 t) may enter and leave the site each day during the peak export season from January to May. Outside of this peak season, around 20 road trains may enter and leave the site each day. A range of trucks are used to haul sand, including B-double and double road trains. Figure 3.15 shows a double road train hauling sand away from site.



Figure 3.15 Typical Double Road Train at Southgate Dunes

The road trains head in both directions along Brand Highway, with the route taken dependent on the final destination. Mid West Sands estimate that around half the trucks head north and half the trucks head south along Brand Highway. Ultimately, the number, size and route taken by the trucks will depend on demand for the sand by farmers and other users.

Mid West Sands operate six days per week (Monday to Saturday) from 7:00 am to 6:00 pm. Where possible, works are not completed on public holidays to avoid heavy public interaction.

3.5 Proposed Extraction Details

3.5.1 Proposed Extraction Area

The proposed extraction area for the coming 5 years is shown in the Extraction Plan provided in Appendix A. As shown, Mid West Sands is requesting an expansion of 9 ha to the existing approved 2018/19 extraction area (23 ha). The proposed total extraction area of 31 ha features a 20 m buffer from the western and southern Lot 2453 boundaries and is outside the majority of the vegetated areas to the east. Mid West Sands is requesting the expansion of the extraction area further south in order to access cleaner sand and enable the forecasted extraction quantities to be achieved.

Given the mobile nature of the Southgate dune system and historical transport that has occurred (refer to Section 2), much of the north-eastern area within Lot 2453 contains dead vegetation, sticks, rocks and general debris. To ensure that the limesand it is suitable for agricultural and industrial uses, the material extracted from these areas therefore requires screening. Mid West Sands currently have the capacity to screen 50,000 tonnes/yr of sand as outlined in Section 3.3. However, the approved annual extraction quantity (168,000 tonnes) and typical demand (refer to Table 2.1) is much higher. Furthermore, there are significant quantities of black soil, which is unsuitable for use, within the north-eastern area (email Doug Wilson, Mid West Sands 3/7/19).

Consequently, to meet the market demand quantities Mid West Sands require access to the clean sand available within the expanded area to the south shown in the Extraction Plan (Appendix A). In the coming 5 years, Mid West Sands propose to continue extracting and screening 50,000 tonnes/yr of sand from the north-eastern area, given the proximity of the dune front to Brand Highway. However, in order to meet sand quantities demanded (potentially up to the 168,000 tonnes/yr limit), Mid West Sands propose to also extract clean sand from the expanded area to the south within Lot 2453.

In the coming 5 years, it is anticipated that extraction will be focussed in the pink area shown in Appendix A. This area is around 16 ha in size and does not extend into the Aboriginal Heritage site.

Extraction from the southern expanded area, as shown by the Extraction Plan in Appendix A, is not expected to have any effect on the existing littoral supply to the Tarcoola Embayment for the following reasons:

- As discussed in Section 2, it has been estimated that only approximately 10% of the littoral supply from the Southgate dune system is from the seaward edge of the Northern Dune.
- The majority (approximately 90%) of the littoral supply, which comes from the northerly facing shoreline of the Western Dune, won't be impacted by the proposed expanded sand extraction operations.
- The expanded sand extraction operations proposed aren't likely to result in a reduction to the littoral supply from the seaward edge of the Northern Dune (3,000 to 5,000 m³/yr). The operations detailed in Section 3, including trafficking over the dunes in this area, may actually inhibit the establishment of vegetation and allow the littoral supply from the seaward edge of the Northern Dune to continue.
- The proposed expanded sand extraction area is over 130 m east of the shoreline, as of March 2019.
- There is no change proposed to the limesand extraction quantities. Mid West Sands propose to adhere to the annual extraction limit of 168,000 tonnes as per Condition 10 of the Development Approval (TP16/150).

Given the above, there is not expected to be any effect on the existing littoral supply from the Southgate dune system from the sand extraction operations proposed over the coming 5 years.

Mid West Sands propose to install additional markers for the site boundary, if the expanded area to the south is approved. The additional markers proposed are shown in the Extraction Plan in Appendix A and will ensure compliance with the approved extraction area.

3.5.2 Proposed Extraction Quantities

As per Condition 10 of Development Approval (TP16/150), granted on 13 September 2016, Mid West Sands is restricted to an annual extraction limit of 168,000 tonnes. Within this limit, the quantity of sand extracted from year to year is totally dependent on user demand (pers com Doug Wilson, Mid West Sands 20/7/18). To accommodate for years of increased demand for limesand, rather than the restriction of an upper extraction limit of 168,000 tonnes of limesand in any given year, Mid West Sands requests the City consider a long-term average approach. Under this approach, any quantity of limesand that is extracted under the limit of 168,000 tonnes/yr could be carried forward to the following year/s. This still ensures that the net quantity of limesand

extracted does not exceed the 168,000 tonnes/yr limit. The following Table 3.1 is proposed to determine the approved carried forward and total sand extraction quantities for ongoing update and use.

Table 3.1 Limesand Extraction Quantities Approved & Carried Forward

Calendar Year	A) Approved Quantity, Including Quantity Carried Forward (tonnes)	B) Recorded Quantities (tonnes)	C) Quantity Carried Forward (tonnes)
2017	168,000	148,660	0
2018	168,000	117,392	0
2019	168,000	To be determined	To be determined (2019A - 2019B)
2020	To be determined (2019A + 2019C)	To be determined	To be determined (2020A - 2020B)

As has been completed since 2016, it is proposed that sand will also be removed from the Southgate Dunes Access Road as required by the City to maintain the road for public access. This quantity is to be completed at the cost of Mid West Sands and not included in determining the extraction totals for each year.

3.5.3 Other Proposed Extraction Details

Sand will be extracted from the extraction area using a minimum of two loading ramps; one on the southern dune front and one on the eastern front. A maximum of four ramps may be required depending on demand.

Sand is to be extracted only above the +3 mAHD contour across the site, as required by Condition 9 of Development Approval (TP16/150). This maximum excavation depth ties in with the approximate level of the vegetation on the western side of the lot. In reality, excavation is likely to remain higher than +3 mAHD on the eastern flank given the level of the surrounding land. Recent excavations have extended to an elevation of around +5 mAHD on the dune faces. It is expected that the +3 mAHD target elevation will be achievable for the foreseeable future, including for the proposed expanded area to the south.

Short term stabilisation of the dune is not practical whilst extraction operations are underway. To minimise the impact of sand drift and nuisance dust on the public, no excavation will occur within 20 m of the lot boundary or 40 m of a road or watercourse. Excavation of the sand on the eastern flank may actually help to reduce wind-blown sand impacting the Brand Highway and adjacent residential lots.

4. Rehabilitation & Decommissioning Plan

The Southgate dunes is a highly mobile dune system, moving to the north at approximately 10 m/yr (refer to Section 2 for more details). The sand dunes are expected to continue to move into the extraction area for the foreseeable future. Attempts at stabilisation and revegetation of the extraction area are therefore likely to be very difficult, as on-going passage of dune fronts would cover any stabilised or revegetated areas.

The rehabilitation and decommissioning plan will therefore aim to return the extraction site to a natural dune state at the end of the works. The following actions are proposed for the decommissioning of the extraction site.

- Very high or unstable excavation faces will be battered and flattened off to reduce potential collapse. It should be noted that steep dune faces are likely to form naturally due to wind forces over time. This process currently occurs naturally within Southgate dunes.
- All of the screened debris and vegetation will be removed from the site and disposed of at an appropriate landfill site.
- All facilities and equipment will be removed from site at the end of the works. This includes all earthmoving equipment, screen, ramps and equipment storage areas.

The Decommissioning Plan in Appendix E shows the proposed decommissioning approach.

5. Benefits to Community

The continued extraction of sand within Lot 2453 of the Southgate Dunes has a number of benefits to the local community and to the City of Greater Geraldton. These are outlined below.

- Economic benefit with direct employment of 10 Mid West Sands employees and indirect employment of around 100 other people from truck drivers to farm hands.
- Improved soil conditions and hence productivity on farms which have the lime sands applied.
- Reduced management of wind blown sand onto Brand Highway and the Southgate Dunes Access Road required by the City of Geraldton and Main Roads WA.

The sand extraction within Lot 2453 of the Southgate Dunes will help Mid West Sands continue to provide the Mid West region with a low cost source of lime sands into the future.

6. References

Department of Aboriginal Sites, 1990. *An archaeological and ethnographic survey of the proposed Geraldton Mid-West Development Authority Sand Pit at Southgate Beach, Geraldton.* Western Australia.

Department of Planning and Urban Development, 1991. *Results from Studies of Southgate Dunes Conducted after Completion of the Southgate Dunes Restoration Study.* Government of Western Australia, Perth.

MRA, 2013. *Southgate Dunes – Sediment Feed Analysis.* R386 Rev 0. Prepared for Bayform Holdings.

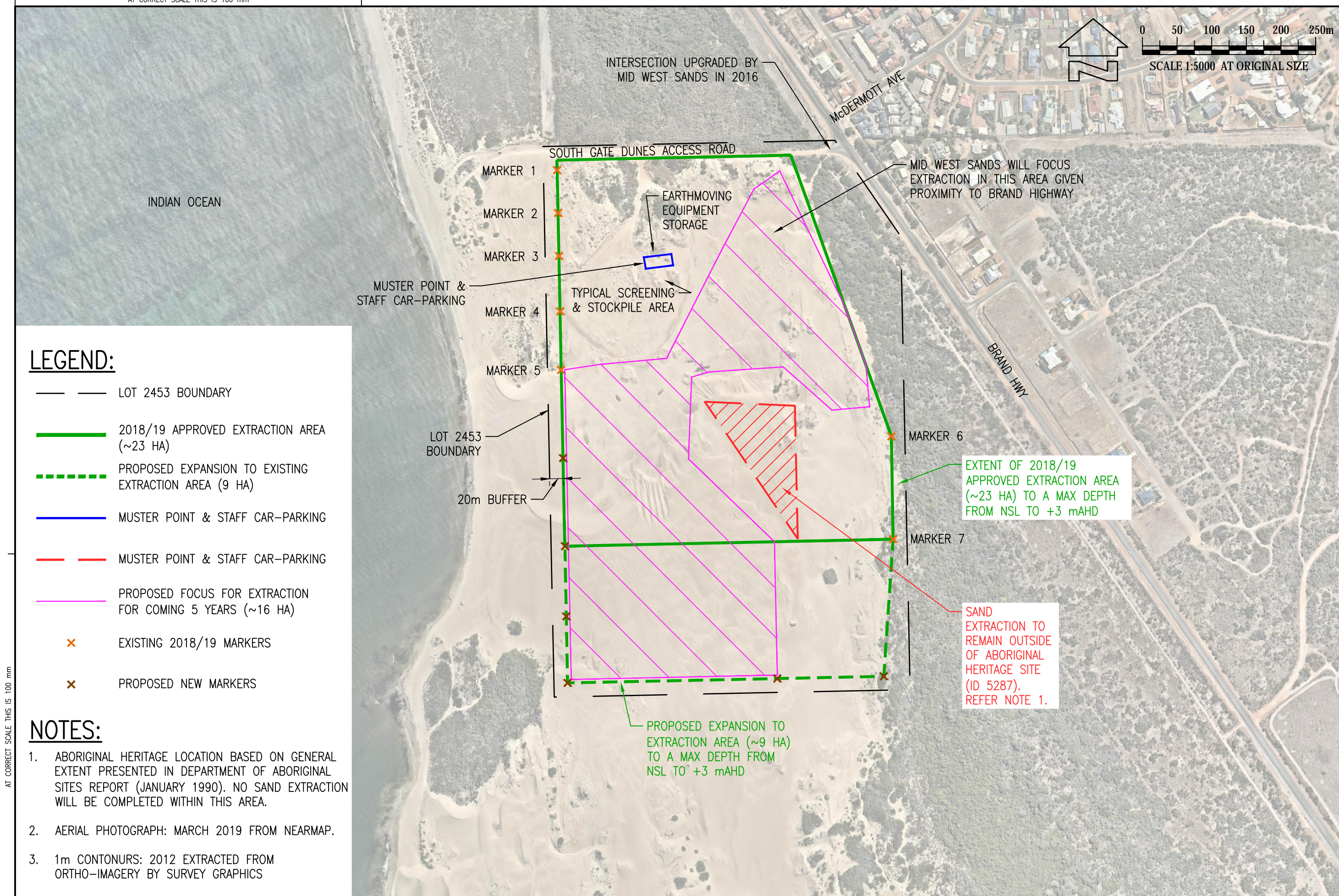
MRA, 2018. *Southgate Dunes Management and Decommissioning Plan.* R784 Rev 4. Prepared for Mid West Sands.

Short, A.D., 2006. *Beaches of the Western Australian Coast: Eucla to Roebuck Bay.* Sydney University Press, University of Sydney.

7. Appendices

Appendix A	Extraction Plan
Appendix B	Purpose Permit
Appendix C	Southgate Lime Sand Extraction Plan (Mid West Sands)
Appendix D	Main Roads WA Email Confirming Compliance
Appendix E	Decommissioning Plan
Appendix F	Southgate Dune Contour Mapping (MRA 2013)

Appendix A Extraction Plan



LEGEND:

- LOT 2453 BOUNDARY
- 2018/19 APPROVED EXTRACTION AREA (~23 HA)
- - - PROPOSED EXPANSION TO EXISTING EXTRACTION AREA (9 HA)
- MUSTER POINT & STAFF CAR-PARKING
- MUSTER POINT & STAFF CAR-PARKING
- PROPOSED FOCUS FOR EXTRACTION FOR COMING 5 YEARS (~16 HA)
- × EXISTING 2018/19 MARKERS
- × PROPOSED NEW MARKERS

NOTES:

1. ABORIGINAL HERITAGE LOCATION BASED ON GENERAL EXTENT PRESENTED IN DEPARTMENT OF ABORIGINAL SITES REPORT (JANUARY 1990). NO SAND EXTRACTION WILL BE COMPLETED WITHIN THIS AREA.
2. AERIAL PHOTOGRAPH: MARCH 2019 FROM NEARMAP.
3. 1m CONTOURS: 2012 EXTRACTED FROM ORTHO-IMAGERY BY SURVEY GRAPHICS

AT CORRECT SCALE THIS IS 100 mm

Appendix B Purpose Permit



Government of **Western Australia**
Department of **Environment Regulation**

Your ref:
Our ref: CPS 7183/1
Enquiries: Simon Weighell
Phone: 9333 7492
Email: nvp@der.wa.gov.au

Mr Brad Smith
Engineer
M P Rogers & Associates Pty Ltd
Suite 1, 128 Main Street
OSBORNE PARK WA 6017

Dear Mr Smith

PERMIT TO CLEAR NATIVE VEGETATION UNDER THE *ENVIRONMENTAL PROTECTION ACT 1986*

I refer to Midwest Sand Supplies application to clear 0.4 hectares of dune vegetation and an unspecified amount of buried dead vegetation within Lot 2453 on Deposited Plan 248687, Cape Burney for the purpose of sand extraction (reference CPS 7183/1).

Please find enclosed Midwest Sand Supplies permit to clear native vegetation granted under section 51E of the *Environmental Protection Act 1986*. This permit authorises the permit holder to clear, subject to certain terms, conditions or restrictions. A copy of the permit is now available for the public to view, as required by the regulations.

A copy of the Decision Report is attached for your information. The Decision Report is also available for the public to view.

Please read the permit carefully. If you wish to discuss the permit, please contact the Department of Environment Regulation. Be aware that there are penalties for failing to comply with the requirements of the permit.

If you disagree with this decision an appeal may be lodged with the Minister for Environment. If you choose to appeal, it must be in writing, setting out the grounds of your appeal, and be received by the Minister within 21 days of being notified of the decision. More information on lodging an appeal is available from the Office of the Appeals Convenor on telephone 6467 5190. Completed appeals should be posted or delivered to:

Office of the Appeals Convenor
Level 22 Forrest Centre
221 St George's Terrace, PERTH WA 6000
Tel: 6467 5190 Fax: 6467 5199
Email: admin@appealsconvenor.wa.gov.au
Web: www.appealsconvenor.wa.gov.au

Third parties may also appeal against the grant of this permit or its conditions.

Please note that clearing must not commence before the date stated on the permit, or in the event of an appeal, after the appeal has been determined and the permit holder has been notified that they may proceed.

Compliance with the terms, conditions or restrictions of this permit does not absolve the permit holder from responsibility for compliance with the requirements of all Commonwealth, State and Local Government legislation.

If you have any queries regarding this approval, please contact Senior Clearing Regulation Officer Mr Simon Weighell on 9333 7492.

Yours sincerely

A handwritten signature in black ink, appearing to read 'E Bramwell', written in a cursive style.

Emma Bramwell
A/ MANAGER
CLEARING REGULATION

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

25 August 2016

Attached: Clearing Permit (CPS 7183/1, Plan 7183/1) and Decision Report.
Fact Sheet 4: Complying with your Clearing Permit



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7183/1
Permit Holder:	Midwest Sand Supplies
Duration of Permit:	From 24 September 2016 to 24 September 2021

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

1. Purpose for which clearing may be done

Clearing for the purpose of sand extraction.

2. Land on which clearing may be done

Lot 2453 on Deposited Plan 248687, Cape Burney

3. Area of clearing

Within the area cross-hatched yellow on attached Plan 7183/1, the Permit Holder may clear:

- (a) buried native vegetation; and
- (b) up to 0.4 hectares of non-buried native vegetation.

4. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation authorised under this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

A handwritten signature in black ink, appearing to read "Emma Bramwell", written over a horizontal line.

Emma Bramwell
A/ MANAGER
CLEARING REGULATION

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

25 August 2016

Plan 7183/1



Legend

-  Imagery
-  Roads
-  Clearing Instruments Activities
-  Local Government Authority



1:7,000
 (Approximate when reproduced at A4)
 UTM Zone 50S
 World Geodetic System 1984

Emma Bramwell Date *25/08/16*
 Emma Bramwell

Officer with delegated authority under Section 20 of the Environmental Protection Act 1986





1. Application details

1.1. Permit application details

Permit application No.: 7183/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Midwest Sand Supplies

1.3. Property details

Property: Lot 2453 on Deposited Plan 248687, Cape Burney
Colloquial name: Southgate Dunes
Local Government Authority: City of Greater Geraldton
DER Region: Midwest

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.4		Mechanical Removal	Sand extraction

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 25 August 2016
Reasons for Decision: The clearing permit application received on 21 July 2016 has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the *Environmental Protection Act 1986*. It has been concluded that the proposed clearing is not likely to be at variance to any of the clearing principles.

The Delegated Officer determined that the proposed clearing is unlikely to have any significant environmental impacts. State policies and other relevant policies have been taken into consideration in the decision to grant a clearing permit.

2. Site Information

2.1. Existing environment and information

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>The application area predominantly comprises bare sand dunes with a few small pockets of dune vegetation.</p> <p>Two Beard vegetation associations (Shepherd et al., 2001) are mapped over the application area:</p> <ul style="list-style-type: none"> 129: Bare areas; rock outcrops 371: Low forest; <i>Acacia rostellifera</i> 	<p>The application is for the clearing of up to 0.4 hectares of dune vegetation as well as any native vegetation within the application area that has historically been buried as a result of sand dune migration. The clearing is for the purpose of sand extraction operations on Lot 2453 on Deposited Plan 248687, Cape Burney.</p>	<p>Completely degraded; no longer intact, completely/almost completely without native species (Keighery, 1994).</p>	<p>The description and condition of the vegetation was determined based on a review of aerial imagery.</p>

3. Assessment of application against clearing principles

Comments The application area predominantly comprises bare sand dunes with a few small pockets of dune vegetation. 0.4 hectares of dune vegetation is proposed to be cleared as well as any native vegetation buried beneath the sand dunes in the event that such vegetation is required to be cleared as part of sand extraction operations. The total size of the application area is approximately 18 hectares.

The application area is considered to be in a completely degraded (Keighery, 1994) condition.

The vegetation under application is considered unlikely to include, or form supporting habitat for, priority flora or threatened ecological communities listed by the Department of Parks and Wildlife, or rare flora declared under the *Wildlife Conservation Act 1950*.

A priority ecological community (PEC) known as 'Coastal sands dominated by *Acacia rostellifera*, *Eucalyptus oraria* and *Eucalyptus obtusiflora* (Geraldton area)' (Priority 1) is mapped immediately north of the application area. It is considered that the proposed clearing is unlikely to result in significant impacts to this PEC. The existing sand dunes are migrating in a northerly direction, with analysis of aerial photography between 2001 and 2010 indicating a rate of migration of approximately 11 metres per year (M P Rogers & Associates PL, 2016). It is considered that the proposed sand extraction is likely to slow the rate of migration, and help prevent the burial of portions of the mapped PEC.

Noting the completely degraded (Keighery, 1994) condition of the vegetation, it is considered that the application area is unlikely to comprise significant habitat for fauna or a significant remnant of native vegetation in a highly cleared landscape, and that the vegetation within the application is unlikely to be performing a significant dune stabilisation function.

According to available databases, no wetlands or watercourses are located within or immediately adjacent to the application area, and the application area does not form part of a conservation area nor does it form part of a significant ecological linkage.

On the basis of the above, it is considered that the proposed clearing is unlikely to cause appreciable land degradation or result in the deterioration of surface or underground water quality, and is unlikely to be of a scale that would result in flooding.

Given the above, the proposed clearing is not likely to be at variance to any of the clearing principles.

Methodology

References:

- Keighery (1994)
- M P Rogers & Associates PL (2016)

GIS datasets:

- SAC Bio Datasets (accessed 25 August 2016)
- Hydrology
- Pre-European Vegetation
- Parks and Wildlife Managed Lands

Planning instruments and other relevant matters.

Comments

The application was advertised for a 21-day public comment period in the *West Australian* newspaper on 25 July 2016. No public submissions were received.

Comment on the application was sought from the City of Greater Geraldton (City). Officer-level advice was received indicating that the City has no objection to the clearing permit application providing that a number of items are addressed including:

- more detailed demarcation of the 0.4 hectares proposed to be cleared;
- a statement of how live vegetation will be protected and provision of a rehabilitation/offset plan; and
- a statement of how Ministerial Statement 1024 relating to the assessment of the 'City of Greater Geraldton Town Planning Scheme No. 1A Amendment 4 – Brand Highway, Cape Burney' under Part IV of the *Environmental Protection Act 1986* has been considered (City of Greater Geraldton, 2016).

Further demarcation of the proposed clearing is not considered necessary nor is a rehabilitation/offset plan considered necessary given that the application area is almost entirely devoid of native vegetation. The clearing permit will not authorise the clearing of live native vegetation outside the application area.

Ministerial Statement 1024 requires the establishment of both a Foreshore Area and a Conservation Area including the development and approval of associated management plans. The Conservation Area is made up of remnant native vegetation located immediately north and east of the application area. The Foreshore Area includes land along the coast including an approximately 100 metre wide portion of the western extent of the application area. The intended purpose of the Foreshore Area is described as 'foreshore management, public access, recreation and conservation'. It is considered that the proposed clearing and associated sand extraction will not prevent this land from being used for its ultimate intended purpose. The applicant advised that sand is to be extracted above the +3m AHD contour across the site consistent with the approximate level of vegetation to the west with recent excavations only extending to a depth of around +5m AHD (M P Rogers & Associates PL, 2016).

The applicant advised that the dune front is likely to continue moving northwards unless the sand is removed, and that that without management the dune may impact the Brand Highway within 10 years (M P Rogers & Associates PL, 2016).

Methodology

References:

- City of Greater Geraldton (2016)
- M P Rogers & Associates PL (2016)

4. References

- Keighery, B.J. (1994), *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- M P Rogers & Associates PL (2016), *Mid West Sands – Southgate Dunes Management & Decommissioning Plan*, R784 Rev 1, July 2016 (DER Ref: A1137478).
- Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), *Native Vegetation in Western Australia*. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- City of Greater Geraldton (2016), *Direct interest comment received in relation to CPS 7183/1*. Received 18 August 2016 (DER Ref: A1150077).

Appendix C Southgate Lime Sand Extraction Plan (Mid West Sands)

Southgate Lime Sand Extraction Plan

The plan for lime sand extraction at Vic. Location 2453 Geraldton W.A. consists of the following:

Site Access Signage and Traffic Management

1. Signage will be in place advising the public that the Southgate Road is a private road.
2. The public can use the road to access the beach with access to the active mining area prohibited.
3. Signage will include speed signs, warning signs and other information signs inclusive of evacuation areas, emergency response processes and contact numbers.
4. Signage in the active mining area inclusive of warning signs, mining in progress signs, truck access, and any signs related to the mining operation will be erected daily before commencement.

Active Mining Area Access and Induction Requirements

1. All operators of plant and equipment on site are fully inducted with verification of competency assessed on machines.
2. All truck drivers will be inducted prior to entry to the mine. This includes stating the rules of the mine and the rules of the road for entering and exiting the pit, speed limits and safety to the public. Drivers will also communicate on entry and exit on CH40 UHF with mine staff and other trucks.

Extraction Methodology

1. The methodology for mining of lime sand at this location consists of the following:
 - Sand is extracted from a number of dune faces using bulldozers and frontend loaders.
 - Sand is loaded onto road trains.
 - If the sand is clean it can be loaded directly into waiting road trains or stockpiled.
 - If the sand is not clean it needs to be passed through a screening plant prior to stockpiling or loading.
 - The loaders load the screen with sand to be cleaned.
 - The loaders take away the clean sand from the screen for either stockpiling or loading.
 - Where sand is further from the loading area, a bulldozer will push the sand if needed closer to the screen or the ramps for loading.
 - The bulldozer is also utilised to manage the slope faces as required to prevent engulfment.
 - The loaders load the trucks from 1 of 3 ramps made of concrete blocks.
 - When the trucks come into the pit they call up on CH40 to ensure it is ok to enter the active mining area.
 - The truck drivers will un-tarp while waiting to be called to the loading area using channel 40.
 - Once in the loading area, truck drivers are not allowed to leave their vehicles until they are loaded and the loader bucket is on the ground.
 - The driver can then get out of the truck and collect the weight docket and tarp up.
 - The driver calls up on CH40 when leaving the active mining area.
 - Site signage must be obeyed at all times.

Safety Reporting and Investigation

2. Any breach of site safety rules will be investigated and actioned accordingly.

- There have been no recordable injuries in 25 years of operation at the Southgate Lime Sand Pit. Midwest Sand Supplies are very proud of this achievement and aim to maintain its safety record.

Outside of the specifics of the operation at the Southgate Lime Sand pit, Midwest Sand Supplies operates a Business Management System consisting of policies, plans and procedures to ensure the effective a successful management of its operations. Some of the areas documented are related to Management, OH&S, Emergency Response, Fitness for Work, Quality and Code of Conduct.

Yours faithfully,



Douglas G Wilson

Principal Employer / Registered Manager

Midwest Sand Supplies

20/07/2016

Appendix D Main Roads WA Email Confirming Compliance

Doug Wilson

From: SALT Mark (NM) [mark.salt@mainroads.wa.gov.au]
Sent: Friday, 9 December 2016 1:29 PM
To: 'philm@cgg.wa.gov.au'
Cc: 'murrayc@cgg.wa.gov.au'; Doug Wilson (midwestsandssupplies@bigpond.com)
Subject: MID WEST SANDS - SOUTHGATES MINE ACCESS CONSTRUCTION

Phil,

I have inspected the works carried out by Mid West Sands with Doug Wilson today and can confirm that the intersection complies with the revised requirements set out by Main Roads in our Letter D16#716041.

A copy of this letter was forwarded to Murray this week for reference.

Main Roads is satisfied that the proposed cartage can now start.

Please contact me if you need further clarification.

Regards

MARK SALT

Network Manager

Mid West-Gascoyne Region

Central and Northern Regions

p: +61 08 9956 1245 | m: +61 429 087 838

w: www.mainroads.wa.gov.au

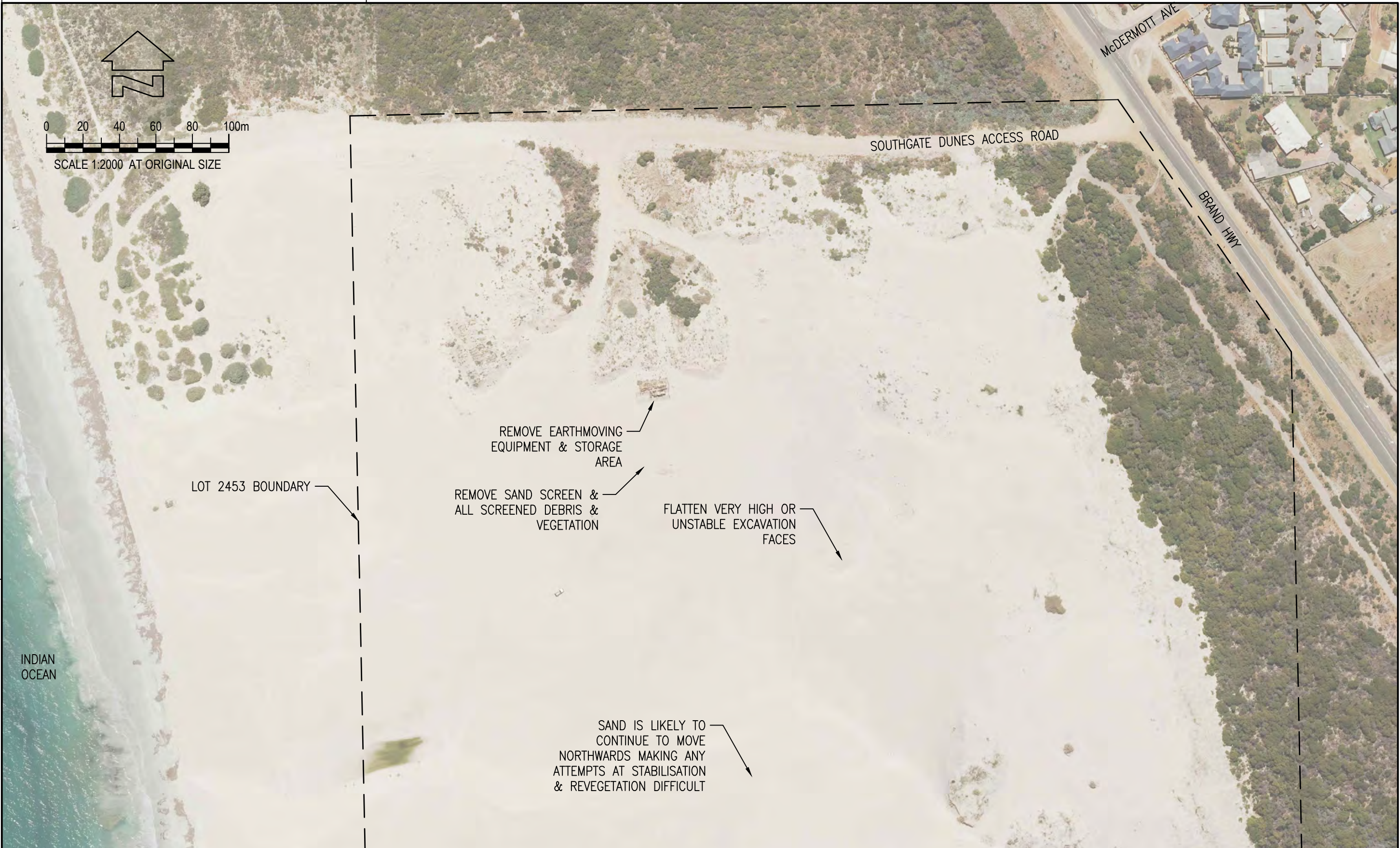


mainroads
WESTERN AUSTRALIA

IN PARTNERSHIP WITH



Appendix E Decommissioning Plan

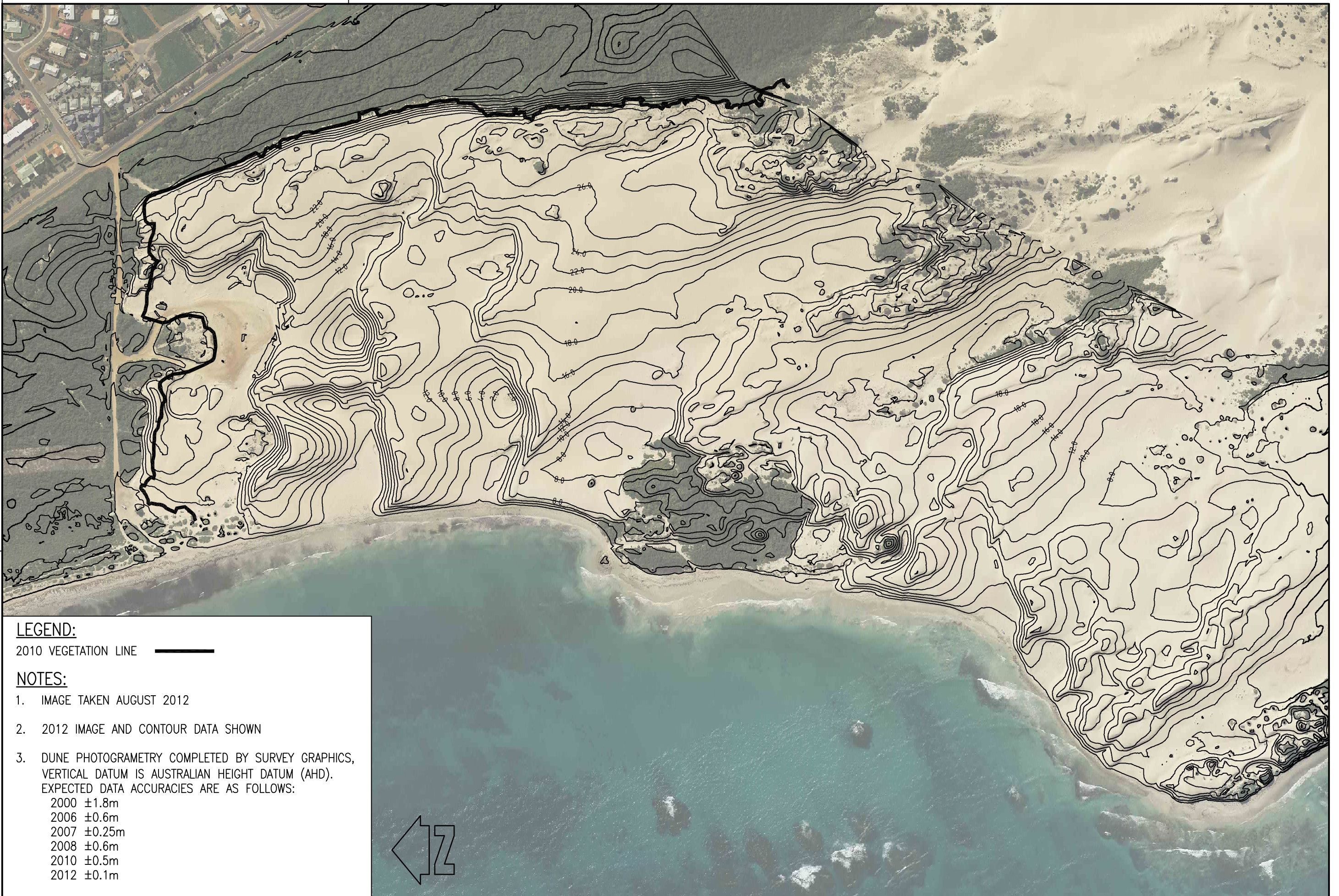


NOTES:

- 1. AERIAL PHOTOGRAPH: NOVEMBER 2015 FROM LANDGATE

AT CORRECT SCALE THIS IS 100 mm

Appendix F Southgate Dune Contour Mapping (MRA 2013)



LEGEND:

2010 VEGETATION LINE 

NOTES:

1. IMAGE TAKEN AUGUST 2012
2. 2012 IMAGE AND CONTOUR DATA SHOWN
3. DUNE PHOTOGRAMMETRY COMPLETED BY SURVEY GRAPHICS, VERTICAL DATUM IS AUSTRALIAN HEIGHT DATUM (AHD). EXPECTED DATA ACCURACIES ARE AS FOLLOWS:
 - 2000 ±1.8m
 - 2006 ±0.6m
 - 2007 ±0.25m
 - 2008 ±0.6m
 - 2010 ±0.5m
 - 2012 ±0.1m

AT CORRECT SCALE THIS IS 100 mm



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