

P. Waardyk and M. Stokes Information Request Response Environmental Report



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ENVIRONMENTAL CONSULTING

**P. Waardyk and M. Stokes– Development Application for
a Material Change of Use for an Environmentally Relevant
Activity– Nine Mile Road, Fairy Bower, QLD 4700**

Environmentally Relevant Activities 16(2)(b) and 16(3)(b)

Applicant Name: P. Waardyk and M. Stokes

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Client: Paul Waardyk

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1 Abbreviations

• APA	- Amalgamated Project Authority
• BoM	- Bureau of Meteorology
• DES	- Department of Environment and Science
• DA	- Development Approval
• EA	- Environmental Authority
• EP Act	- <i>Environmental Protection Act 1994</i>
• EP Regulation	- Environmental Protection Regulation 2019
• EPP Air	- Environmental Protection (Air) Policy 2019
• EPP Noise	- Environmental Protection (Noise) Policy 2019
• ERA	- Environmentally Relevant Activity
• EVs	- Environmental Values
• Fitzroy River EV/WQO	- <i>Environmental Protection (Water) Policy 2009 Fitzroy River Sub-basin Environmental Values and Water Quality Objectives, Basin No. 130 (part), including all waters of the Fitzroy River Sub-basin, September 2011</i>
• GBR	- Great Barrier Reef
• HES	- High Ecological Significance
• IR	- Information Request
• MCU	- Material Change of Use
• MSES	- Matters of State Environmental Significance
• RRC	- Rockhampton Regional Council
• RSO	- Registered Suitable Operator
• SARA	- State Assessment and Referral Agency
• SDAP	- State Development Assessment Provisions
• Water Act	- <i>Water Act 2000</i>
• WRR Act	- <i>Waste Reduction and Recycling Act 2011</i>
• WQO	- Water Quality Objective

2 Executive Summary

Mr Paul Waardyk has operated extractive and screening environmentally relevant activities (ERAs) under the trading name Hardcore Sands at Nine Mile Road, Fairy Bower 4700 since 2013. Following a recent reconfiguration of the land parcel, the ERAs are now undertaken on Lot 100 SP318665 under environmental authority (EA) EPPR01425013. The EA limits extraction and screening of the alluvial sand at the location to up to 250,000 tonnes per year. Mr Waardyk is seeking the ability to increase the intensity of sand extraction and processing at Hardcore Sands to up to 500,000 tonnes per year to successfully supply significant construction projects planned for around Rockhampton and adjacent local government areas.

An information request (IR) has been issued by the State Assessment and Referral Agency (SARA) within the Department of State Development, Infrastructure, Local Government and Planning following submission of a development application (and application for an EA) to increase the intensity of the extractive ERAs at Hardcore Sands.

This report addresses the environmental management-related items (1 and 3) in the IR and demonstrates that increasing the intensity of the extractive ERAs will not have a significant impact on the receiving environment.

3 Introduction

3.1 Existing Operation

Mr Paul Waardyk owns and operates Hardcore Sands, a quarrying enterprise that targets the extensive alluvial sand deposits on the Fitzroy River floodplain just west of Rockhampton. Mr Waardyk's quarry is situated on Lot 100 SP318665 at Nine Mile Road, Fairy Bower 4700 (Figure 1). The quarry is licensed to extract and process up to 250,000 tonnes of sand per year as extractive and screening environmentally relevant activities (ERAs) under the provisions of the *Environmental Protection Act 1994* (EP Act). The ERAs are undertaken on the subject land under environmental authority (EA) EPPR01425013 (Appendix A). The EA is an amalgamated project authority (APA) which also licenses Mr Waardyk's dredging and screening ERAs within and adjacent to the Fitzroy River at Pink Lily approximately 5 km north of Hardcore Sands.



Figure 1. Location of Hardcore Sands on Lot 100 SP318665 (shown bordered white) at Fairy Bower in relation to Rockhampton and Gracemere. [Source: Queensland Globe®].

The ERA thresholds Hardcore Sands at Fairy Bower quarry operates within are:

- **ERA 16(2)(b)** – *Extracting, other than by dredging 100,000 t to 1,000,000 t; of material in a year*
- **ERA 16(3)(b)** – *Screening 100,000 t to 1,000,000 t of material in a year*

3.2 Site Location and History

Mr Waardyk was issued a development permit for a material change of use (MCU) to undertake the extractive ERAs in early 2014. The application was made before significant changes were made to environmental licensing in Queensland following the passing of the *Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012*. Conditions imposed under the EP Act were applied to the activity as a concurrence agency response which the assessment manager Rockhampton Regional Council (RRC) then included in the development permit. Since then, those concurrence conditions were taken to be the EA.

The quarry is located to the immediate west of Rockhampton, approximately 1 km from the Rockhampton Airport (Figure 1). The original concurrence conditions for the ERAs were first issued by the then Department of Environment and Heritage Protection in August 2013. Mr Waardyk purchased the land – which was previously four separate lots on plans – exclusively to establish a sand quarry to supply high quality alluvial sand to the local market. Mr Waardyk amalgamated the four lots into the one lot on plan, which became Lot 100 SP120491 (Figure 2). The lots were combined because RRC conditioned the requirement to amalgamate the four lots into one in the development approval (DA) issued for the extractive activity. Since then, Lot 100 SP120491 has been reconfigured into Lot 100 SP318665, with a large portion of the previous Lot 100 SP120431 removed to accommodate the planned Rockhampton Ring Road which will now pass adjacent to Mr Waardyk's property rather than through it (Figures 2 and 3). The existing EA still refers to Lot 100 SP120431, so a new EA issued by the Department of Environment and Science (DES) for the increased threshold ERAs will have to reflect the change to the lot/plan which has recently occurred.

Prior to Mr Waardyk acquiring the property, the land was used to graze cattle for over a century. The land has had the non-remnant vegetation extensively cleared in the past, and mostly only young acacia species are now found on site (Figures 4 and 5), with only limited eucalyptus species remaining. This location at Fairy Bower is situated squarely in the Fitzroy River floodplain (Figures 4 and 8). The gradient of the land is gentle, gradually sloping toward the southern property boundary. The dominant ground cover on the subject land is pasture grass.

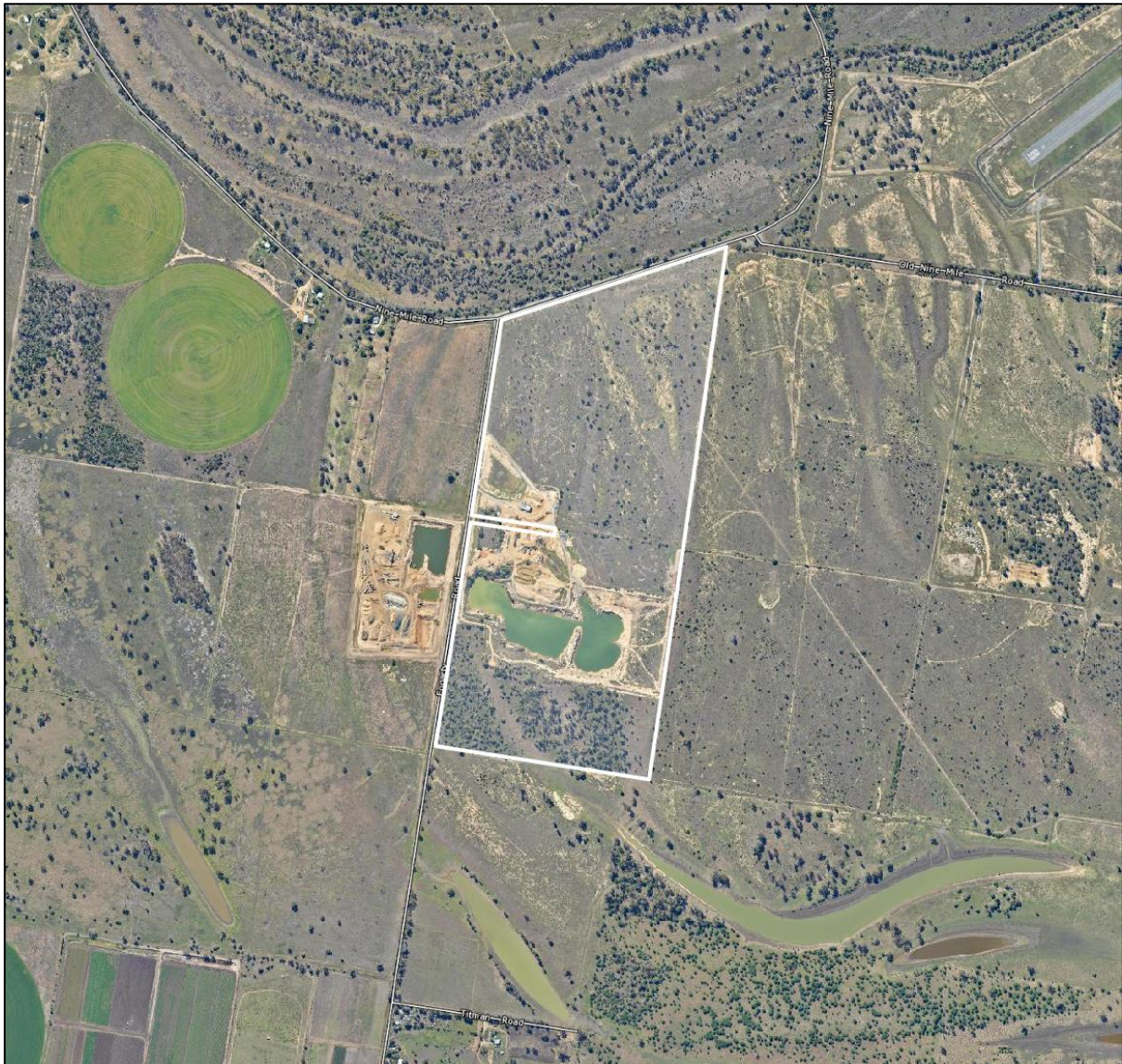


Figure 2. Lot 100 SP120491 as shown in the existing DA and EA. This has recently been reconfigured into Lot 100 SP318665 (Figure 3) so the proposed Rockhampton Ring Road can be constructed [Source: Queensland Globe®].

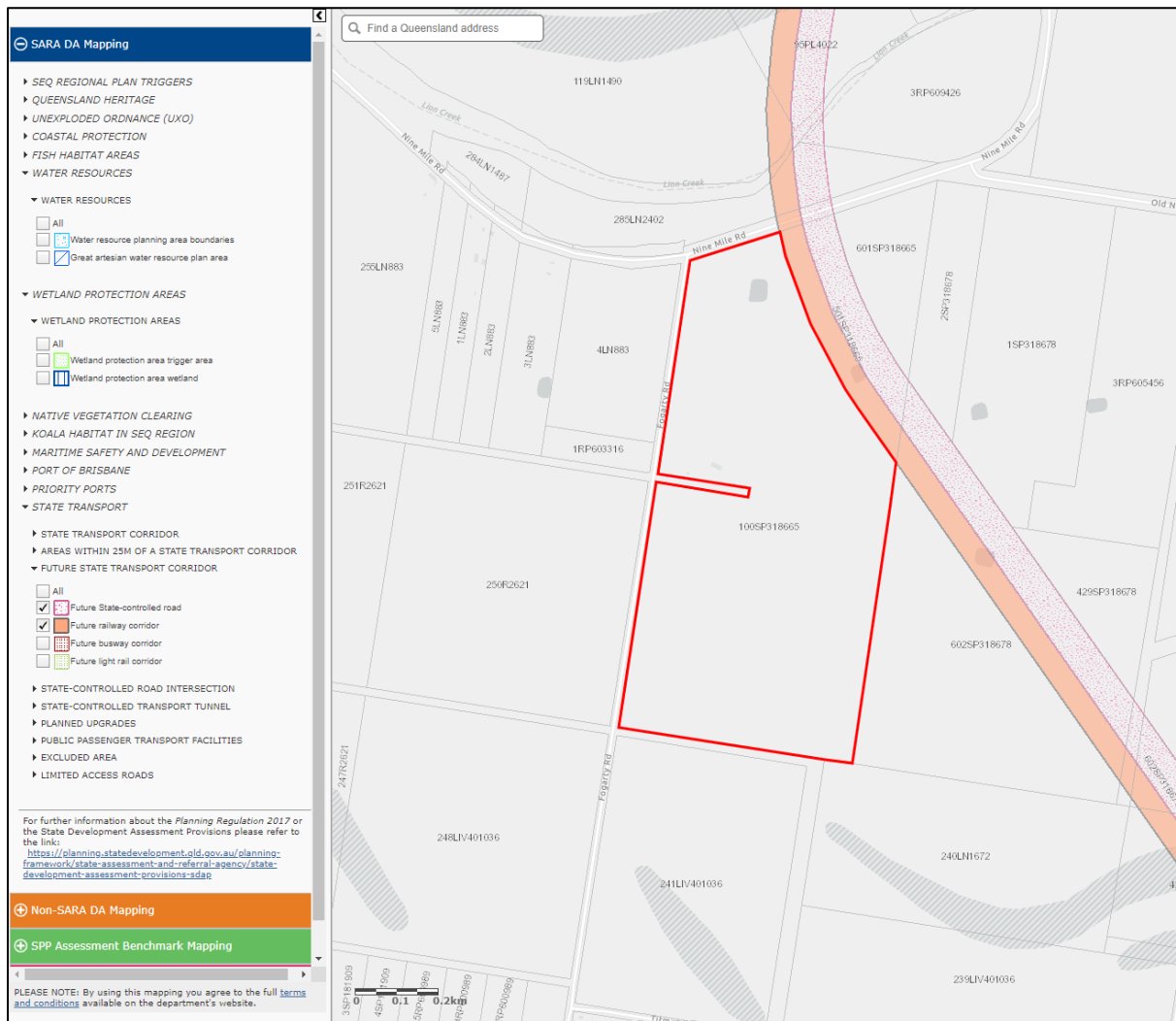


Figure 3. Truncated Lot 100 SP120431 in Figure 2, which is now Lot 100 SP318665. The northeast corner has been removed to allow for the Rockhampton Ring Road (shown as future rail and road corridor) [Source: Department of State Development, Infrastructure, Local Government and Planning's DA Mapping System].



Figure 4. Facing east on Lot 100 SP318665 toward Rockhampton. The Berserker Ranges are evident in the background. This is already licensed extractive area under the existing DA and EA.



Figure 5. Photo taken on Lot 100 Facing west toward the sand processing area. The land seen in this photo is already licensed extractive area under the existing DA and EA.

3.3 Surrounding Area

Located immediately west of the city of Rockhampton, Hardcore Sands is in a rural area where the primary land use is cattle grazing. Some cropping is also undertaken close to Hardcore Sands, demonstrated by green circles to the west and southwest of the licenced extractive activity which indicate the use of centre-pivot watering systems (Figure 2). All the immediate surrounding land is part of the right bank flood plain of the Fitzroy River where during larger flood events, flood water flows over land from the breakout at Pink Lily between south Rockhampton and Gracemere (Figures 7 and 8). The entire area can be inundated during these larger events, and as such the land on the floodplain has never been extensively developed (Figure 8). There are two other licensed extractive ERAs adjacent to Hardcore Sands, both of which also target the alluvial sand deposits associated with the Fitzroy River floodplain (Figure 6). Mapped wetlands of high environmental significance (HES) are present to the north and south of the subject land.



Figure 6. Hardcore Sands activity location in the Fitzroy River floodplain (white polygon) and other alluvial sand extractive ERAs nearby (red shading) [Source: Queensland Globe®].

3.4 EA holder and Registered Suitable Operator

The related development application to increase the intensity of operations at Hardcore Sands has again been made by P. Waardyk and M. Stokes. However, the holder of the EA presently in effect is Mr Paul Waardyk.

Paul Waardyk is also a Registered Suitable Operator (RSO) under the EP Act, reference number RSO003345. This information was provided with the application in *Development application Form 1 – Application details – attachment for an application for an environmental authority*. Should this application be successful, the EA that DES issues will also be held by RSO Mr Paul Waardyk.

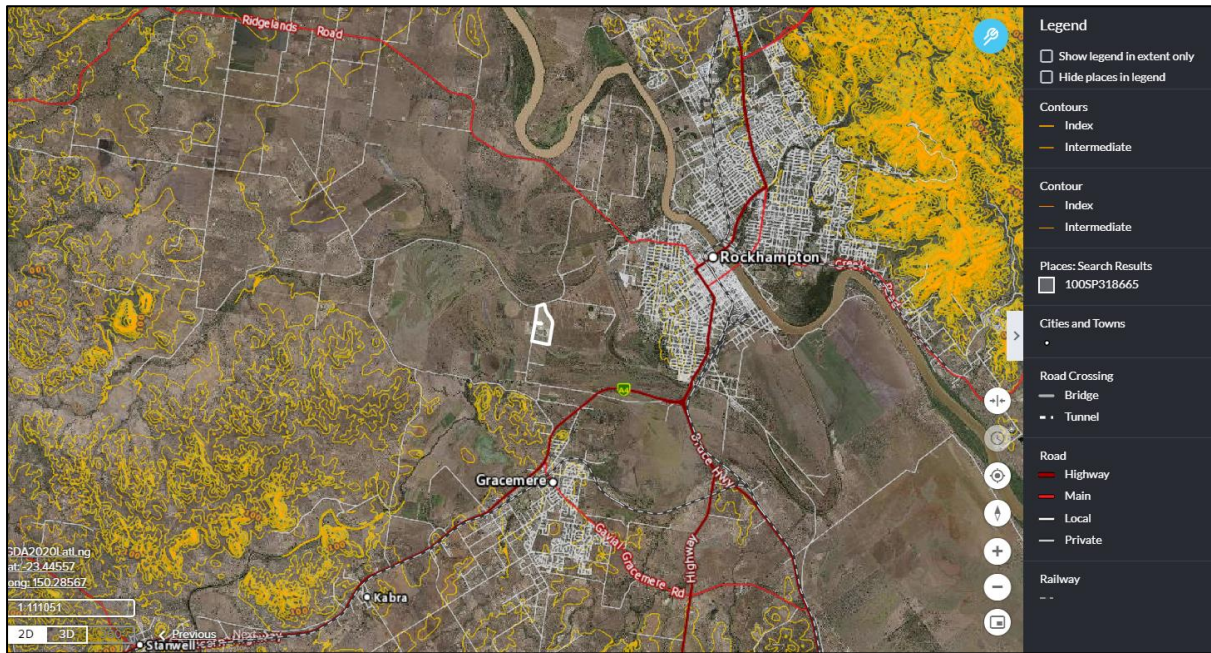


Figure 7. Topography of Lot 100 SP318665. Note the absence of contour lines over the flat Fitzroy River floodplain [Source: Queensland Globe®].

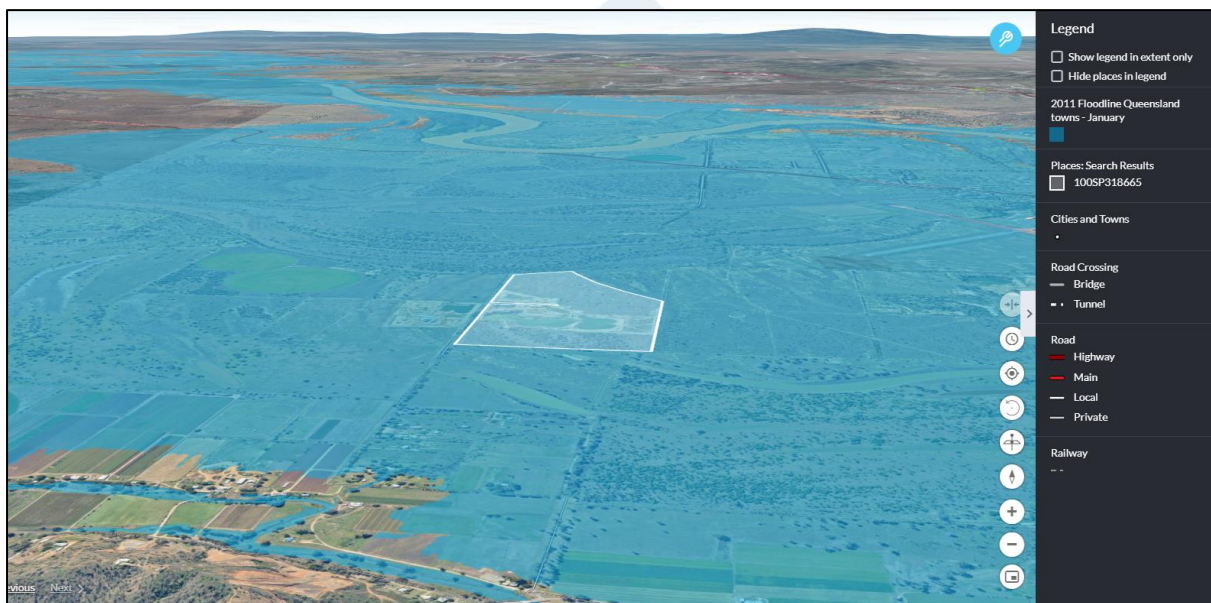


Figure 8. 3D image of Lot 1 SP318665 and the surrounding area facing north, shown with the 2011 flood mapping overlain. The Fitzroy River where it breaks out at Pink Lily during major flooding can be seen directly north of the subject land [Source: Queensland Globe®].

3.5 Operation of the extractive and screening ERAs

The extractive activity targets the extensive deposits of alluvial sand on the western floodplain of the Fitzroy River at Fairy Bower. The existing EA permits the extraction of up to 250,000 t per year of sand which is below the natural surface/topsoil layer of approximately 0.7-1.5 m. Hardcore Sands supplies the sand mainly to the building industry and road construction projects in central Queensland. The deposit is largely homogeneous coarse alluvial sand, however various size river stones are also

extracted in very minor amounts along with the sand. These are screened into various sizes and sold as a range of products.

Figure 9 below is a satellite image captured in October 2022 which shows the general layout of the extractive and screening ERAs on site. Extraction involves removing topsoil using an excavator or scraper and storing in low mounds around the periphery of the extraction area (Figure 10). The seed bank in the topsoil results in rapid germination of grass species after rain, the roots of which perform the function of holding this topsoil in place and thereby preventing erosion and loss to the receiving environment.



Figure 9. General layout of the extractive and screening activities. Note the sediment collection/water return channel which captures fine sand and sediment prior to it entering the main retention basin. [Source: Google Earth, imagery date October 2022].



Figure 10. Stored topsoil (foreground) completely obscured by grass on the southern aspect of the extractive zone. The grass establishes naturally and holds topsoil together preventing erosion.

Although the activity is located on land, the river sand is extracted using a dredge because the water table is so close to the surface at this location (Figure 11). The dredge sits permanently on the surface of the active extractive pit. It is run by a diesel engine, which draws sand (and water) from the bottom of the active pit before delivering it to the sand processing area (Figure 12). Water drawn out of the extractive pit with sand is returned to the retention basin via a convoluted water return channel (Figure 9). The channel configuration provides longer retention time for the water returning to the basin and thus allows any sand and the minor sediment to drop out of suspension along its course. A variable height weir at the end of the water return channel slows the flow of water and keeps almost all sand and sediment contained within the channel (Figure 13). Eventually Hardcore Sands removes the accumulated material from the channel and reprocesses it into various products.

Fairy Bower is a non-regulated groundwater area because of how plentiful the resource is on the Fitzroy River floodplain. Although there are many users of the groundwater resource at Fairy Bower, the height of the water table remains relatively constant during years that receive average rainfall.



Figure 11. Floating dredge situated in extractive pit.



Figure 12. The Hydrocyclone and piles of recovered sand. The Hydrocyclone is the first stage of processing.



Figure 13. Height-adjustable weir board showing sediment collected upstream (top of photo), and clean water below (middle of photo).

4 Responses to Information Request Items

In terms of appropriately addressing environmental management requirements for the proposed increase in the intensity of the extractive ERAs, the information request issued by the State Assessment and Referral Agency (SARA) describes the requirement to address the following State Development Assessment Provisions (SDAP):

- State code 22: Environmentally relevant activities (Item 1 of the IR), and
- State code 9: Wetland protection area (Item 3 of the IR)

The second item in the IR relates to the state transport infrastructure trigger and will not be addressed in this report.

More specifically, the required action stated in the IR for addressing State code 22 is italicised below:

Please provide an assessment of the likely impact of the other change on environmental values, including but not necessarily limited to:

- (a) a description of the environmental values likely to be affected by each relevant activity;*
- (b) details of any emissions or releases likely to be generated by each relevant activity;*
- (c) a description of the risk and likely magnitude of impacts on the environmental values;*
- (d) details of the management practices proposed to be implemented to prevent or minimise adverse impacts; and*
- (e) details of how the land the subject of the application will be rehabilitated after each relevant activity ceases.*

The required action relating to State code 22 is essentially asking to address the same matters that the EP Act requires are addressed for applications for a new site-specific ERA. Section 125 of the EP Act places additional requirements on variation and site-specific applications and states they must:

- a) include an assessment of the likely impact of each relevant activity on the environmental values, including—*
 - A. a description of the environmental values likely to be affected by each relevant activity; and*
 - B. details of any emissions or releases likely to be generated by each relevant activity; and*
 - C. a description of the risk and likely magnitude of impacts on the environmental values; and*
 - D. details of the management practices proposed to be implemented to prevent or minimise adverse impacts; and*
 - E. details of how the land the subject of the application will be rehabilitated after each relevant activity ceases; and*
- b) include a description of the proposed measures for minimising and managing waste generated by each relevant activity.*

The one difference between the IR and the requirements of section 125 in the EP Act being that the EP Act also requires that the applicant provides details of how waste will be minimised/managed.

Although the IR does not specifically ask to describe how waste will be managed/minimised, this will be addressed in this response.

Responses to the SDAP State codes 22 and 9 are provided in Appendix B.

This section will address the first IR item by discussing the proposal to increase the intensity of the extractive activity in accordance with the environmental management objectives for the major environmental management subject areas described in the Environmental Protection Regulation 2019 (EP Regulation), which are *air* (air quality and potential environmental nuisance impacts associated with dust and odour), *noise*, *water* (including groundwater and wetlands), *land and waste*. This section also considers the environmental values (EVs) associated with the receiving environment, and an assessment of the likely impact of the proposed amendment in accordance with the requirements of the EP Act.

4.1 Air

This section will address how the proposed expansion to the extractive and screening activities will be undertaken in a manner that will prevent and/or minimise potential impact on the air environment.

4.1.1 Environmental management objectives

Part 3 Environmental objectives and performance outcomes Division 1 Operational assessment Schedule 8, Part 3 of the EP Regulation contains *Division 1 – Operational assessment*, which prescribes the environmental objectives and performance outcomes for the broad areas of environmental management. The environmental objectives and performance outcomes for air are reproduced below:

Environmental Objective

The activity will be operated in a way that protects the environmental values of air.

Performance outcomes

1. *There is no discharge to air of contaminants that may cause an adverse effect on the environment from the operation of the activity.*
2. *All of the following—*
 - (a) *fugitive emissions of contaminants from storage, handling and processing of materials and transporting materials within the site are prevented or minimised;*
 - (b) *contingency measures will prevent or minimise adverse effects on the environment from unplanned emissions and shut down and start up emissions of contaminants to air;*
 - (c) *releases of contaminants to the atmosphere for dispersion will be managed to prevent or minimise adverse effects on environmental values.*

Schedule 8, Part 2, Section 2 of the EP Regulation states that the relevant environmental objective is achieved if either item 1 of the performance outcome for the environmental objective is achieved, or item 2 of the performance outcomes for the relevant environmental objective is achieved.

4.1.2 Environmental values for the air environment (Air)

The Environmental Protection (Air) Policy 2019 (EPP Air) identifies the following EVs for air to be protected:

- a) *the qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems; and*
- b) *the qualities of the air environment that are conducive to human health and wellbeing; and*
- c) *the qualities of the air environment that are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures and other property; and*
- d) *the qualities of the air environment that are conducive to protecting agricultural use of the environment.*

The activity is already conducted in a manner which prevents generation of significant dust or odour. Likely emissions that will be produced by the proposed activity, the risk and likely magnitude of impacts, and management practices to be implemented to prevent or minimise impacts upon the EVs of the air environment are detailed below.

4.1.3 Management of potential impacts

The potential impacts on the air environment are discussed below in terms of environmental nuisance and environmental harm. An understanding of localised climate data is integral to appropriately managing potential risks to air in the receiving environment that may result from operating extractive and screening ERAs. The quarry is located close to the Australian Bureau of Meteorology’s (BoM) Rockhampton Aero station, which is situated approximately 3 km roughly northeast of the licensed extractive and screening ERAs. Site details for the Rockhampton Aero station are provided in Table 1 below:

Table 1. Site details for BoM climate data station, Rockhampton Aero

Site Name	Rockhampton Aero
Site number	039083
Commenced	1939
Latitude	-23.3753
Longitude	150.4775
Elevation	10.4 m
Operational status	Open

An appreciation of when a location is expected to receive seasonal rainfall during wetter months is important for ensuring extractive and screening ERAs will be undertaken in a manner that will minimise the risk of environmental harm or result in impacting sensitive receptors by causing environmental nuisance. Wetter months in the year often do not require quarry operators to implement the same level of mitigation measures to prevent or minimise potential impact on the receiving environment from air emissions. Rehabilitation is also planned around the wetter period in the year to improve the probability that plants will germinate from the viable seedbank in topsoil once spread over a rehabilitated area. Figure 14 below presents average monthly rainfall data for BoM's Rockhampton Aero station. The wetter months for Rockhampton are November through to March.

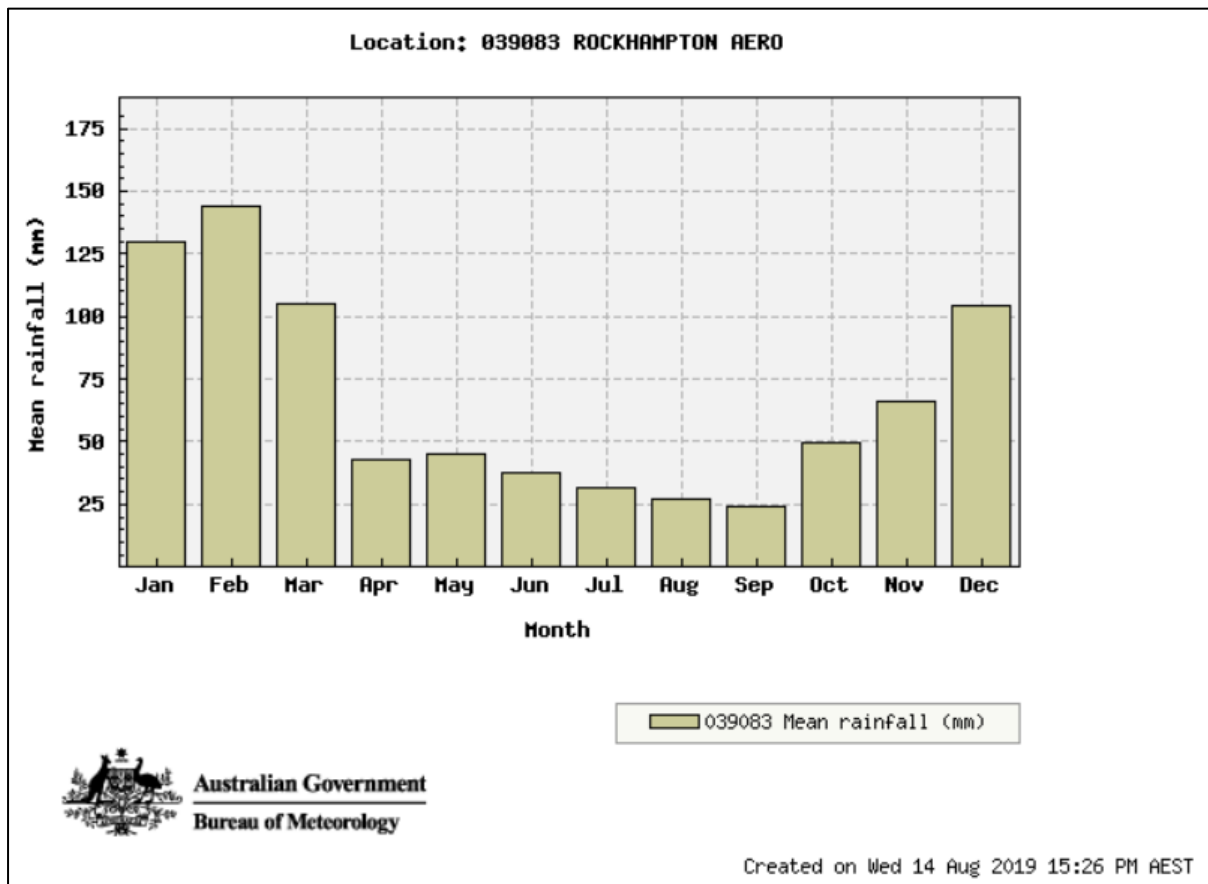


Figure 14. Average monthly rainfall (mm) for Rockhampton Aero, situated approximately 3 km from Hardcore Sands [Source: BoM].

One of the main climatic influences on the potential to cause environmental nuisance from operating extractive and screening ERAs is wind direction which can influence the location where any dust generated while conducting the activity may impact upon. Wind direction varies throughout any year, and wind roses for several climate data stations around Australia are publicly available. Wind roses almost invariably demonstrate each location experiences wind from predominant directions. This is an advantage for ERA operators since appreciating the predominant wind direction at different times of the day provides an additional tool for helping to understand those times where the potential for impacting on sensitive receptors in the receiving environment is elevated.

The closest BoM station that records wind data is the Rockhampton Aero Station, 3 km northeast of the licensed place. BoM makes available annual wind rose data for two separate times in a day – 9:00 AM and 3:00 PM. The 9:00 AM and 3:00 PM annual wind roses for Rockhampton Aero station are presented in Appendix C. The wind roses show that the predominant breeze at 9:00 AM and 3:00 PM is from the southeast and east respectively. The greatest risk to sensitive receptors in the receiving environment from dust would be those situated to the northwest and west of the quarry.

Sections 4.1.3.1 and 4.1.3.2 discuss the potential environmental nuisance impacts from dust and odour respectively. Section 4.1.3.3 discusses the potential for environmental harm to result from emissions from the proposed activity, and where necessary proposes mitigation measures to minimise potential impacts on the EVs of air.

4.1.3.1 Dust

Operating extractive and screening ERAs carries the potential to generate dust. Quarries generally do not have sealed roads, which means vehicle movements over unsealed trafficable areas are also a potential source of dust. Plant such as excavators and loaders in operation at extractive and screening ERAs are also potential sources. The type of material being extracted, and the extractive method are also factors that require consideration when assessing for the potential to generate dust. Many hard rock quarries require blasting to access the resource. Blasting is a routine part of many extractive ERAs and generates significant volumes of dust without the ability to mitigate impact on nearby sensitive uses particularly effectively. Crushing and screening plant also carry risk of generating dust. Operating extractive and screening ERAs with large areas of exposed/bare ground can result in these areas generating significant volumes of dust under the right climatic conditions. The location of sensitive receptors in relation to the extractive and screening ERAs is a major factor that must be considered. Appropriate dust mitigation strategies are in use by Mr Waardyk on Lot 100 SP318665 to minimise the risk of dust nuisance.

To assess the risk and likely magnitude of impacts on EVs for the air environment from dust, several factors were considered:

- Extraction and processing techniques.
- Vehicle and plant movements.
- The licensed extraction area.
- The location of the activity in relation to sensitive uses (Figure 15).
- The surface of trafficable areas.
- Predominant wind conditions for the area in relation to sensitive receptors.
- Staff training in environmental management.
- Complaints history.



Figure 15. Location of all sensitive uses (circled black) within 1 km of the boundary of Hardcore Sands. The closest is a residence approximately 320 m west along Nine Mile Road. The other licensed quarries nearby are also shown (shaded red) [Source: Queensland Globe®].

After considering potential impacts on EVs for the air environment and surrounding sensitive uses in relation to dust, the proposal to increase the rate of extraction and processing will have no additional impact upon these values or uses. The extractive and screening ERAs have been appropriately established in a rural setting at Fairy Bower on the Fitzroy River floodplain, and although there are 8 private residences within 1 km of the boundary of Hardcore Sands, however the closest is about 350 m away. They are all separated from the licensed ERAs by an appropriate buffer distance. Mr Waardyk has not received any complaints alleging dust nuisance since the quarry commenced operating in 2014. The extraction technique involves using a floating dredge to pump sand from below the water table to a hydrocyclone for separation from the water. The sand is therefore always wet when processed, so there is no risk of dust being generated. No blasting is required to extract sand at the quarry. The extraction zone will remain as a water storage once the sand resource has been recovered, so large areas of ground will not remain exposed where the situation may normally arise for land-based quarries which require adequate time and tending to establish vegetation during the rehabilitation process.

Although extracted sand does not immediately pose a risk of generating dust because it is wet from dredging, there are many dust management practices in use on site to prevent or minimise adverse impacts from dust. These include:

- Ensuring plant and vehicles travelling over trafficable surfaces are operated at sufficiently low speed to minimise generation of dust. Management actively enforce this requirement on plant and transport operators that enter site.
- Remaining informed about impending climatic conditions by consulting the BoM website for daily weather forecasts ahead of commencement of daily operations to. This will allow proper preparation and planning to implement necessary control measures in a timely manner, and prior to dust having the opportunity to become a nuisance at sensitive receptors in the receiving environment.
- Clearing vegetation and topsoil during favourable weather conditions to minimise the concentration of dust and particulates that are liberated during this process.
- Using a water truck to wet down trafficable areas and stockpiles that may generate dust during drier periods.
- Covering trucks with an appropriate tarpaulin once loaded.
- Where necessary, installing water misters onto processing plant.
- Ensuring all staff are appropriately trained to ensure housekeeping practices are adhered to, and to identify potential sources of dust before they reach levels that might result in a significant dust nuisance in the receiving environment.
- Ensuring staff are trained and aware of their obligations under the EA and the EP Act.

4.1.3.2 *Odour*

Odour impacting upon the receiving environment is generally not an issue associated with extractive activities and Hardcore Sands is no exception. There is no acid sulphate soil associated with the activity. There is no odour associated with extracting the sand resource at the licensed place, however running equipment inefficiently may lead to an odour nuisance in the receiving environment. With appropriate mitigation strategies in place the risks associated with odour from these ERAs can be easily managed. Factors considered when assessing potential impact from odour emanating from the sand quarry activity on surrounding sensitive uses were:

- The type of material won from open extractive areas.
- The proximity of the extractive and screening ERAs in relation to the nearest sensitive uses.
- The predominant wind conditions for the area in relation to sensitive receptors.
- Staff training in environmental management.

After considering potential impacts on EVs for the air environment and surrounding sensitive uses in relation to odour, it is not considered that the activity will have any impact upon these uses, with appropriate mitigation measures in place.

Management practices to prevent or minimise adverse impacts from odour will include:

- Ensuring vehicles, plant and equipment are maintained in an excellent state of repair and operated in accordance with manufacturer's specifications.
- Ensuring that management and staff are aware of weather conditions and wind direction, and the potential for odour to travel toward sensitive receptors.
- Ensuring staff are appropriately trained and aware of their obligations under the EA and the EP Act.

4.1.3.3 *Air quality*

Operation of the extractive and screening activities does not involve release of emissions from any point sources other than vehicle and plant exhausts. Where plant and vehicles are not appropriately maintained, the outcome may result in a release of excessive emissions to air, which in turn could impact on the air environment.

The following controls will be in place to ensure impact on air quality is minimised or prevented:

- Ensuring vehicles, plant and equipment are maintained in an excellent state of repair and operated in accordance with manufacturer's specifications.
- Ensuring staff are appropriately trained to ensure that circumstances that may result in excessive emissions emanating from plant or vehicles are remedied as quickly as practicable.
- Ensuring staff are appropriately trained and aware of their obligations under the EA and the EP Act.

The proposal to increase the intensity of extraction up to 500,000 tonnes per year will not involve altering already established practices at Hardcore Sands, nor the mitigation measures which ensure the ERAs are already being undertaken in accordance with best practice environmental management aimed at minimising impact on the air environment.

No complaints have been received from sensitive uses in the receiving environment alleging that the activity is impacting upon air quality. No additional impact on the air environment will result from the proposed expansion.

4.1.4 **Summary of analysis of potential impact from dust and odour, and provisions to protect the environmental values of air**

The extractive and screening ERAs undertaken at Hardcore Sands are situated an appropriate distance from commercial and residential sensitive receptors. The quarry uses effective mitigation measures to ensure that dust does not cause environmental nuisance at sensitive uses in the receiving environment. Daily management checks involve ensuring potential sources of dust on site are

monitored, and the risk of dust being generated is appropriately managed. The footprint of the quarry was expanded through a major amendment to the EA process in 2020. The proposal to increase the intensity will not involve further expansion to the already licensed quarry footprint.

The extractive and screening ERAs do not carry a significant risk of causing an odour nuisance, nor have there been any complaints of odour emanating from the facility. Plant and vehicle are the only point sources of emissions and undergo maintenance at a schedule specified by the manufacturer. Potential odour sources from the activity are minimal, however by ensuring plant and vehicles are maintained according to manufacturer's recommendations, the risk of odour is insignificant.

4.1.4.1 Assessment against performance outcomes

By adopting and adhering to the measures described above to manage potential impacts from dust and odour, the performance outcomes described in item 2 for the environmental objective as prescribed in the EP Regulation Schedule 8, Part 3, Division 1 for air will be met. Mr Waardyk takes all reasonable and practicable measures to minimise the potential for the licensed ERAs to impact upon the EVs of air. The operation of the activity is already being, and will continue to be undertaken in such a way that the qualities of the air environment conducive to protecting the health and biodiversity of ecosystems and human health are protected. This extends to ensuring the qualities of the air environment conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures and other property are also protected. Further, the mitigation measures the activity has adopted will ensure the agricultural air environment is also protected. The proposed change to the existing ERAs will have no significant impact on the EVs of air.

4.2 Noise

This section will address how the activity will be undertaken in a manner that will prevent and/or minimise the potential impact of noise on sensitive uses in the receiving environment.

4.2.1 Environmental management objectives

Schedule 8, Part 3, Division 1 of the EP Regulation prescribes the environmental objectives and performance outcomes for noise as follows:

Environmental Objective

The activity will be operated in a way that protects the environmental values of the acoustic environment.

Performance outcomes

- 1. Sound from the activity is not audible at a sensitive receptor.*
- 2. The release of sound to the environment from the activity is managed so that adverse effects on environmental values including health and wellbeing and sensitive ecosystems are prevented or minimised.*

Schedule 8, Part 2, Section 2 of the EP Regulation states that the relevant environmental objective is achieved if either item 1 of the performance outcome for the environmental objective is achieved, or item 2 of the performance outcomes for the relevant environmental objective is achieved.

4.2.2 Environmental values for the acoustic environment (Noise)

The Environmental Protection (Noise) Policy 2019 (EPP Noise) identifies the following EVs for the acoustic environment to be protected:

- a) *the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and*
- b) *the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following—*
 - i) *sleep;*
 - ii) *study or learn;*
 - iii) *be involved in recreation, including relaxation and conversation; and*
- c) *the qualities of the acoustic environment that are conducive to protecting the amenity of the community.*

Likely emissions the quarry will produce, the risk and likely magnitude of impacts, and management practices to be implemented to prevent or minimise impacts upon the EVs of the acoustic environment are detailed below.

4.2.3 Management of potential impacts

The extractive activity presents a risk of noise emissions due to the following processes:

- Removal of the topsoil layer using excavators or other suitable plant.
- Extracting the sand resource using various plant such as a dredge and excavators.
- Loading trucks with an excavator or front end loader.
- Processing won sand into various sized products using screening plant.
- Truck movements along internal roads.

To assess the risk and likely magnitude of impacts on EVs of the acoustic environment, several factors were considered:

- The activities are located in a rural setting, and an appropriate distance from the nearest sensitive receptors (Figure 15). The distance of the quarry footprint to sensitive uses has already been assessed as part of the last amendment application, and was deemed appropriate.

- The extractive method is dredging, which involves the floating dredge being positioned below ground level in the active pit. The pit is also surrounded by earthen mounds which assist to contain noise within the active pit.
- The dredge is operated using a diesel engine which powers the pump. Noise from the engine is appropriately attenuated by an exhaust muffler.
- The activity has been operating under appropriate approvals (including an EA) for many years without noise complaints.
- The quarry only operates during daylight hours when background noise is already elevated. The Rockhampton Airport is less than 3 km away, and two other licensed sand quarries also occupy the area (Figure 15). The most significant source of noise for the location is air traffic on route to or departing from Rockhampton Airport.
- Truck movements along Fogarty Road and internal haul roads are maintained at sufficiently low enough speed so that excess noise is not generated. No exhaust brakes are used.

After considering potential impacts on EVs for the acoustic environment it is not considered that the proposal to increase the extractive intensity will have any impact upon sensitive uses with appropriate mitigation measures in place.

Management practices proposed to prevent or minimise adverse impacts will include:

- Conducting the extractive and screening processes between the hours of 06:00 AM and 06:00 PM Monday to Saturday. No extraction or processing will occur on Sunday or public holidays. These hours are consistent with the approved hours in the existing DA for the extractive industry.
- Ensuring all plant and equipment on-site is maintained in sound working order and in accordance with manufacturer's specifications. Mechanical failures that result in plant or vehicles producing elevated noise levels will result in such being shut down and repaired as soon as practicable to ensure no unnecessary noise continues.
- Ensuring vehicle movements are kept to a sufficiently slow speed to minimise the potential to impact on sensitive receptors in the receiving environment.
- Inducting all staff to ensure they are aware of environmental obligations under the EA and penalties that can potentially be imposed by not complying with conditions in the EA or wider obligations under the EP Act.

4.2.4 Summary of analysis of potential impact from noise on the acoustic environmental values

By employing the measures described above to manage potential impacts from noise, the performance outcomes described in item 2 for the environmental objective as prescribed in the EP Regulation Schedule 8, Part 3, Division 1 for noise will be met. The proposed activity will have no

impact on the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems, nor human health and wellbeing. A suitable acoustic environment for enjoying activities such as sleep, study, or recreation will be preserved, and the amenity of the community will be protected.

4.3 Water

The extractive and screening ERAs present possible risks to the EVs of water, which includes EVs identified in surface water, groundwater and wetlands. The extremely homogeneous nature of the sand resource in the alluvium at this location in the Fitzroy River floodplain means that extraction and processing is very straightforward. However, with any activity that involves use of mechanised equipment, there will always remain a risk to waters in the receiving environment, regardless of how low the risk is.

Mr Waardyk already uses appropriate mitigation strategies to prevent, or at the very least, minimise potential impact on the EVs of waters in the receiving environment. These mitigation measures will continue when the extraction intensity increases.

This section considers the possible risks and proposes appropriate mitigation measures for potential impacts on water that may result from the proposal to increase the intensity of extraction to up to 500,000 tonnes per year. The section has been separated into discussing potential impacts and mitigation measures for surface water (section 4.3.1), and for groundwater (section 4.3.2).

The Queensland Map of Referable Wetlands shows there are many mapped palustrine wetlands on the Fitzroy River floodplain surrounding Lot 100 SP318665 (Appendix D). There are, however, no mapped wetlands on the subject land itself. The Map of Referable Wetlands describes the surrounding palustrine wetlands as either HES wetlands or wetlands of general ecological significance. Section 4.3.3 considers potential impacts on the mapped HES wetlands.

4.3.1 Surface water

The proposed activity presents potential impacts on the EVs of surface water, which include:

- Impacting on receiving waters by discharging sediment-laden stormwater offsite.
- Contamination of receiving waters by discharging chemical spills offsite.
- Vehicles and plant releasing hydrocarbons to ground which has the potential to reach waters in the receiving environment.

4.3.1.1 Environmental management objectives

Schedule 8, Part 3, Division 1 of the EP Regulation prescribes the environmental objectives and performance outcomes for waters as follows:

Environmental Objective

The activity will be operated in a way that protects environmental values of waters.

Performance outcomes

1. *There is no actual or potential discharge to waters of contaminants that may cause an adverse effect on an environmental value from the operation of the activity.*
2. *All of the following—*
 - (a) *the storage and handling of contaminants will include effective means of secondary containment to prevent or minimise releases to the environment from spillage or leaks;*
 - (b) *contingency measures will prevent or minimise adverse effects on the environment due to unplanned releases or discharges of contaminants to water;*
 - (c) *the activity will be managed so that stormwater contaminated by the activity that may cause an adverse effect on an environmental value will not leave the site without prior treatment;*
 - (d) *the disturbance of any acid sulfate soil, or potential acid sulfate soil, will be managed to prevent or minimise adverse effects on environmental values;*
 - (e) *acid producing rock will be managed to ensure that the production and release of acidic waste is prevented or minimised, including impacts during operation and after the environmental authority has been surrendered;*
 - (f) *any discharge to water or a watercourse or wetland will be managed so that there will be no adverse effects due to the altering of existing flow regimes for water or a watercourse or wetland;*
 - (g) *for a petroleum activity, the activity will be managed in a way that is consistent with the coal seam gas water management policy, including the prioritisation hierarchy for managing and using coal seam gas water and the prioritisation hierarchy for managing saline waste;*
 - (h) *the activity will be managed so that adverse effects on environmental values are prevented or minimised.*

Schedule 8, Part 2, Section 2 of the EP Regulation states that the relevant environmental objective is achieved if either item 1 of the performance outcome for the environmental objective is achieved, or item 2 of the performance outcomes for the relevant environmental objective is achieved.

4.3.1.2 Environmental values of water

When considering potential impact on the EVs of water, waters in the immediate receiving environment must be considered since waters across Queensland have been assigned specific EVs. The subject land is within the catchment of the Fitzroy River immediately downstream of the Fitzroy River Barrage storage which is owned and managed by RRC. The site is located on the right bank floodplain, downstream of where major flooding in the Fitzroy River breaks out at Pink Lily approximately 4.5 km to the immediate north. There are no watercourses or drainage features on the subject land that have been defined under the *Water Act 2000* (Water Act), nor are there any unmapped water features on the subject land (Figure 16). The closest defined watercourses under the Water Act are Neerkol Creek (shown as Scrubby Creek in Queensland Globe) approximately 1.5 km south of Hardcore Sands and Lion Creek to the immediate north (Figure 16). Both Scrubby Creek and Lion Creek discharge into the Fitzroy River; Lion Creek confluences just above the Fitzroy River Barrage,

whereas Scrubby Creek first confluences with Gavial Creek to the south before it subsequently discharges into the upper estuarine reaches of the Fitzroy River downstream of the barrage.

No other mapped watercourses are in the area immediately surrounding the subject land.

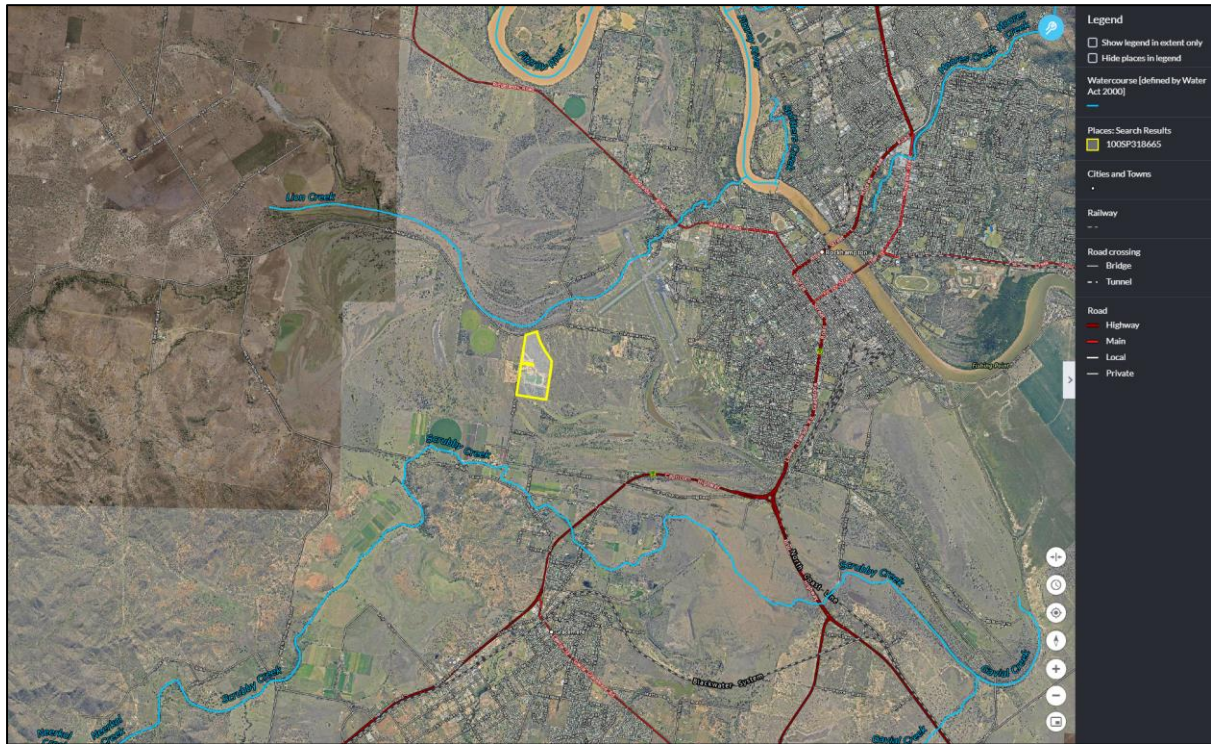


Figure 16. Watercourses in the vicinity of Lot 100 SP318665 (yellow polygon). The closest defined watercourse is Lion Creek to the north which discharges into the Fitzroy River above the Fitzroy River Barrage. [Source: Queensland Globe®].

The *Environmental Protection (Water) Policy 2009 Fitzroy River Sub-basin Environmental Values and Water Quality Objectives, Basin No. 130 (part)*, including all waters of the Fitzroy River Sub-basin, September 2011 (Fitzroy River EV/WQO) has an accompanying plan (WQ1305) that divides the waters in the Fitzroy River sub-basin into separate areas for which EVs have been determined. The subject land has a division line for two of these areas running directly through the lot on plan. The north/west portion is shown on plan WQ1305 as part of the area known as ‘Fitzroy south/central tributaries’, whereas the east/south portion is described as ‘Fitzroy main channel below barrage (estuarine)’.

4.3.1.3 Environmental values of waters in the Fitzroy River basin

The Fitzroy River EV/WQO prescribes EVs and water quality objectives (WQOs) for the Fitzroy River sub-basin waters and its tributaries. As mentioned in section 4.2.1, the subject land sits across two distinct areas for which the Fitzroy River EV/WQO prescribes slightly different EVs. Both areas share seven of the EVs described in the document, however the Fitzroy River EV/WQO prescribes five additional EVs for the ‘Fitzroy south/central tributaries’ as necessary to protect. The EVs prescribed for the ‘Fitzroy south/central tributaries’ are as follows:

- Aquatic ecosystems
- Irrigation

- Farm supply
- Stock water
- Aquaculture
- Human consumer
- Primary recreation
- Secondary recreation
- Visual recreation
- Drinking water
- Industrial use
- Cultural and spiritual values

The physico-chemical WQOs and management intent (level of protection) for *Fitzroy River – Sub-basin fresh waters* are reproduced from the Fitzroy River EV/WQO in Table 2 below. The management intent for most waters is to achieve no less than a moderately disturbed condition, for which DES has derived corresponding WQOs.

Table 2. Physico-chemical water quality objectives for Fitzroy River Sub-basin fresh waters.

Water area/type	Management intent (level of protection)	Water quality objectives to protect aquatic ecosystem EVs
Fitzroy River Sub-basin fresh waters	Aquatic ecosystem – moderately disturbed	<ul style="list-style-type: none"> • ammonia N: <20 µg/L • oxidised N: <60 µg/L • organic N: <420 µg/L • total nitrogen: <500 µg/L • filterable reactive phosphorus (FRP): <20 µg/L • total phosphorus: <50 µg/L • chlorophyll a: <5 µg/L • dissolved oxygen: 85% – 110% saturation • turbidity: <50 NTU • suspended solids: <85 mg/L • pH: 6.5 – 8.5 • conductivity (EC) baseflow: <445 µS/cm • conductivity (EC) high flow: <250 µS/cm • sulphate: <15 mg/L

4.3.1.4 Management of potential impacts

Potential impacts from increasing the intensity of sand extraction on surface waters in the receiving environment will be managed/mitigated by:

- Adhering to established operational processes and procedures for extracting and processing sand. Extracting the homogeneous sand resource at Hardcore Sands is a simple process which requires minimal use of plant and very little processing prior to sale.

- Shaping the land around the quarry footprint to ensure overland flow from storms, high rainfall events and floods that originate upstream is diverted around the disturbed area.
- Revegetating disturbed areas as quickly as possible. The greater the area of exposed ground, the larger the risk of sediment being transported in rainwater. Exposed areas will be revegetated with grazing pasture or native plants as soon as possible.
- Treating all rainwater that falls on the disturbed footprint of the quarry as contaminated water, and directing this water to a retention basin.
- Maintaining an appropriate freeboard in retention basins so there remains the capacity to assimilate significant stormwater flows into the existing system. The quarry has had no releases of water to the receiving environment since operations commenced.
- Storing any chemicals used onsite within a secondary containment system.
- Employing the use of minimal plant and equipment onsite. Ensuring vehicles, plant and equipment are maintained in an excellent state of repair and operated in accordance with manufacturer's specifications.
- Maintaining spill response equipment on site, and ensuring staff are familiar with its location and how to use it.
- Ensuring only experienced staff are permitted to operate key infrastructure such as the floating dredge and screening plant.
- Inducting all staff to ensure they are aware of environmental obligations under the EA and penalties that can potentially be imposed by not complying with conditions in the EA or wider obligations under the EP Act.

4.3.2 Groundwater

Hardcore Sands has been established on a floodplain where the water table is close to the natural ground surface, so groundwater is inevitably encountered through extracting the sand resource. The water table is extremely close to the surface of the natural ground level at many parts of Fairy Bower because much of it is in the extensive Fitzroy River floodplain. The subject land parcel is not in a groundwater management area, therefore groundwater at the location is unregulated. Conducting the ERAs may risk impacting upon the groundwater environment. These risks include:

- Contamination from chemicals through spills that are permitted to soak into the ground and therefore impact groundwater directly.
- Spills from the floating dredge that enter water in the active extractive pit. This water is exposed groundwater visible from the land surface.
- Contamination from chemical spills that reach surface waters, which in turn can recharge groundwater systems.

4.3.2.1 *Environmental management objectives*

Schedule 8, Part 3, Division 1 of the EP Regulation prescribes the environmental objectives and performance outcomes for groundwater as follows:

Environmental Objective

The activity will be operated in a way that protects environmental values of groundwater and any associated surface ecological systems.

Performance outcomes

1. *Both of the following apply—*
 - (a) *there will be no direct or indirect release of contaminants to groundwater from the operation of the activity;*
 - (b) *there will be no actual or potential adverse effect on groundwater from the operation of the activity.*
2. *The activity will be managed to prevent or minimise adverse effects on groundwater or any associated surface ecological systems.*

Schedule 8, Part 2, Section 2 of the EP Reg states that the relevant environmental objective is achieved if either item 1 of the performance outcome for the environmental objective is achieved, or item 2 of the performance outcomes for the relevant environmental objective is achieved.

4.3.2.2 *Environmental values of groundwater*

The Fitzroy River EV/WQO lists the following EVs as requiring protection in Fitzroy groundwaters in the area of the licensed ERAs:

- Aquatic ecosystems
- Irrigation
- Farm supply
- Stock water
- Primary recreation
- Drinking water
- Industrial use
- Cultural and spiritual values

The Fitzroy River EV/WQO states that where groundwaters interact with surface waters, groundwater quality should not compromise identified EVs and WQOs for those waters.

4.3.2.3 *Management of potential impacts*

The potential impacts on groundwater will be managed/mitigated by:

- Adhering to established operational processes and procedures for extracting and processing sand. Extracting the homogeneous sand resource at Hardcore Sands is a simple process which requires minimal use of plant and very little processing prior to sale.

- Shaping the land around the quarry footprint to ensure overland flow from storms, high rainfall events and floods that originate upstream is diverted around the disturbed area.
- Revegetating disturbed areas as quickly as possible. The greater the area of exposed ground, the larger the risk of sediment being transported in rainwater. Exposed areas will be revegetated with grazing pasture or native plants as soon as possible.
- Treating all rainwater that falls on the disturbed footprint for the quarry as contaminated water, and directing this water to a retention basin.
- Maintaining an appropriate freeboard in retention basins so there remains the capacity to assimilate significant stormwater flows into the existing system. The quarry has had no releases of water to the receiving environment since operations commenced.
- Storing any chemicals used onsite within a secondary containment system.
- Employing the use of minimal plant and equipment onsite. Ensuring vehicles, plant and equipment are maintained in an excellent state of repair and operated in accordance with manufacturer's specifications.
- Maintaining spill response equipment on site, and ensuring staff are familiar with its location and how to use it.
- Ensuring only experienced staff are permitted to operate key infrastructure such as the floating dredge and screening plant.
- Inducting all staff to ensure they are aware of environmental obligations under the EA and penalties that can potentially be imposed by not complying with conditions in the EA or wider obligations under the EP Act.

4.3.3 Wetlands

The quarry presents a risk of potential impact on the EVs of wetlands. There are no mapped wetlands on Lot 100 SP218665, and the water bodies that are present are a result of sand extraction. However, parts of the land parcel are mapped as being in the Great Barrier Reef (GBR) wetland protection area according to the state's wetland mapping information (Appendix D). The GBR wetland mapping places a buffer around HES wetlands, which are also described as a Matter of State Environmental Significance (MSES) in mapping layers in the Department of Natural Resources, Mines and Energy's Queensland Globe online mapping system (Figure 17). However, Mr Waardyk committed to maintaining a permanent 200 m buffer between the quarry footprint and mapped HES wetlands to the north and south of Hardcore Sands. The existing EA empowered the preservation of a 200 m buffer between the quarry footprint and the HES wetlands surrounding the subject land. This present proposal to increase the intensity of sand extraction and processing at the quarry will not result in the altering of the existing licensed footprint. Therefore, the disturbed area of the quarry will not extend any further toward these mapped sensitive areas.

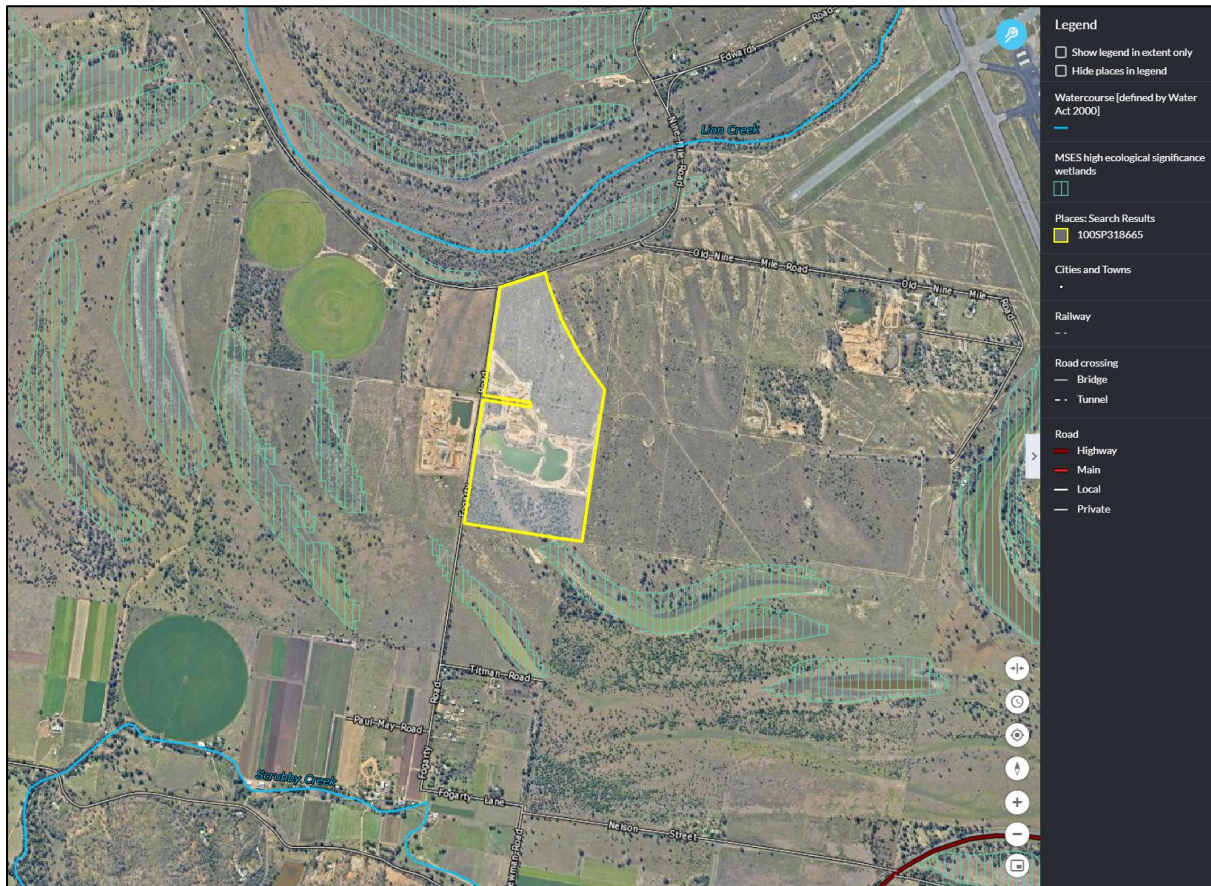


Figure 17. Mapped HES wetlands on the Fitzroy River floodplain surrounding Hardcore Sands [Source: Queensland Globe®].

Accepted conventional environmental management strategies will be implemented to ensure potential impact on wetlands in the receiving environment continues to be minimised to the greatest extent. These mitigation strategies are discussed below.

4.3.3.1 Environmental management objectives

Schedule 8, Part 3, Division 1 of the EP Regulation prescribes the environmental objectives and performance outcomes for wetlands as follows:

Environmental Objective

The activity will be operated in a way that protects the environmental values of wetlands.

Performance outcomes

1. *There will be no potential or adverse effect on a wetland as part of carrying out the activity.*
2. *The activity will be managed in a way that prevents or minimises adverse effects on wetlands.*

Schedule 8, Part 2, Section 2 of the EP Regulation states that the relevant environmental objective is achieved if either item 1 of the performance outcome for the environmental objective is achieved, or item 2 of the performance outcomes for the relevant environmental objective is achieved.

4.3.3.2 *Management of potential impacts*

The potential impacts on the mapped HES wetland will be managed/mitigated by:

- Adhering to established operational processes and procedures for extracting and processing sand. Extracting the homogeneous sand resource at Hardcore Sands is a simple process which requires minimal use of plant and very little processing prior to sale.
- Maintaining the existing licensed 200 m buffer between the quarry footprint and the HES wetlands.
- Shaping the land around the quarry footprint to ensure overland flow from storms, high rainfall events and floods that originate upstream is diverted around the disturbed area.
- Revegetating disturbed areas as quickly as possible. The greater the area of exposed ground, the larger the risk of sediment being transported in rainwater. Exposed areas will be revegetated with grazing pasture or native plants as soon as possible.
- Treating all rainwater that falls on the disturbed footprint for the quarry as contaminated water, and directing this water to a retention basin.
- Maintaining an appropriate freeboard in retention basins so there remains the capacity to assimilate significant stormwater flows into the existing system. The quarry has had no releases of water to the receiving environment since operations commenced.
- Storing any chemicals used onsite within a secondary containment system.
- Employing the use of minimal plant and equipment onsite. Ensuring vehicles, plant and equipment are maintained in an excellent state of repair and operated in accordance with manufacturer's specifications.
- Maintaining spill response equipment on site, and ensuring staff are familiar with its location and how to use it.
- Ensuring only experienced staff are permitted to operate key infrastructure such as the floating dredge and screening plant.
- Inducting all staff to ensure they are aware of environmental obligations under the EA and penalties that can potentially be imposed by not complying with conditions in the EA or wider obligations under the EP Act.

4.3.4 **Summary of analysis of potential impact of the proposed activity on surface water, groundwater and wetlands, and provisions to protect the environmental values of the aquatic environment**

Increasing the intensity of sand extraction and screening to up to 500,000 tonnes per year will result in the continuation of engaging in the use of appropriate mitigation strategies to prevent significant impact on surface waters in the receiving environment. There will be no significant impact on

groundwater by extracting the sand and processing it at a faster rate. The HES wetlands surrounding Hardcore Sands will not be impacted by the increased intensity of the activity because of the way the quarry is managed, but also by maintaining the already approved 200 m buffer between quarry and wetlands. The extraction of the homogeneous sand resource at this location is a very simple and straightforward process that requires minimal plant and equipment. The EVs associated with surface water and groundwater in the receiving environment will be protected.

By adhering to the measures described above to manage potential impacts on water from the activity, all the performance outcomes prescribed in item two for the environmental objective for water as prescribed in the EP Regulation Schedule 8, Part 3, Division 1 will be met.

The performance outcome prescribed in item two for the environmental objective for groundwater as prescribed in the EP Regulation Schedule 8, Part 3, Division 1 will be met. The proposed activity will be undertaken in such a way that will protect the EVs of the groundwater environment.

The performance outcome prescribed in item one for the environmental objective for wetlands as prescribed in the EP Regulation Schedule 8, Part 3, Division 1 will be met. The activity will be undertaken in a manner which protects the EVs of wetlands.

4.4 Land

The proposed increase to the existing intensity of the extractive activity presents a possible risk of environmental impact to the EVs associated with land, which include:

- Discharging sediment-laden stormwater onto land in the receiving environment.
- Releasing chemicals offsite through spills that aren't immediately cleaned up.
- Releasing dust and particulates that can settle on land and impact upon vegetation and built infrastructure on land.

4.4.1 Environmental management objectives

Schedule 8, Part 3, Division 1 of the EP Regulation prescribes the environmental objectives and performance outcomes for land as follows:

Environmental Objective

The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.

Performance outcomes

1. *There is no actual or potential disturbance or adverse effect to the environmental values of land as part of carrying out the activity.*
2. *All of the following—*

- (a) activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the environmental values of land;*
- (b) areas disturbed will be rehabilitated or restored to achieve sites that are—*
 - (i) safe to humans and wildlife; and*
 - (ii) non-polluting; and*
 - (iii) stable; and*
 - (iv) able to sustain an appropriate land use after rehabilitation or restoration;*
- (c) the activity will be managed to prevent or minimise adverse effects on the environmental values of land due to unplanned releases or discharges, including spills and leaks of contaminants;*
- (d) the application of water or waste to the land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils.*

Schedule 8, Part 2, Section 2 of the EP Regulation states that the relevant environmental objective is achieved if either item 1 of the performance outcome for the environmental objective is achieved, or item 2 of the performance outcomes for the relevant environmental objective is achieved.

4.4.2 Environmental values for the land environment

The document “Guideline - Application requirements for activities with impacts to land”, ESR/2015/1839 - Version 4.03, produced by DES identifies the following EVs for land that may need to be protected:

- *Terrain, geology, shallow groundwater systems, floodplains, springs, soil descriptions and the presence of distinct or unique features.*
- *Soil health and function, and the ability for soil to sustain growth of native vegetation, crops and other flora (i.e. soil suitability).*
- *Bioregions and regional ecosystems including their health and biodiversity.*
- *The natural interaction of the relevant land with other ecosystems, including wetlands, faults connecting groundwater systems, surface waters etc.*
- *Flora including vegetation communities endangered, vulnerable, rare or near threatened species and pest species.*
- *Fauna including fauna present, protected animal breeding places, endangered, vulnerable, rare or near threatened species, pest species, plants or animals and their habitats, including threatened wildlife, near threatened wildlife and rare wildlife under the relevant legislation including Nature Conservation Act 1992. Flora and fauna identification will likely require detailed studies to be undertaken to allow the applicant to accurately describe these environmental values.*
- *Category A and B and C environmentally sensitive areas for resource activities. Both category A and B environmentally sensitive areas are listed within the Environmental Protection Regulation 2008.*

- *Areas with high ecological significance values including, but not necessarily limited to, wetlands, nationally threatened ecological communities, large tracts of remnant vegetation, corridors and special biodiversity areas.*
- *Prescribed environmental matters as defined in the Queensland Environmental Offsets Act 2014.*
- *For land that may be used in primary industry or for agricultural purposes, the suitability of the land for that use.*
- *For land that may be used for recreation or aesthetic purposes, the suitability of the land for that purpose.*
- *For land that may be used for industrial purposes, the suitability of that industrial use.*
- *The cultural and spiritual values of the land.*
- *Qualities of the land which are conducive to human health and wellbeing.*
- *The qualities of the land which are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures and other property.*

4.4.2.1 *Vegetation*

The proposed amendment to the activity involves simply increasing the intensity of sand extraction and processing. The existing licensed extractive footprint will not alter through this proposal (refer to site plan in the EA in Appendix A). The subject land is mapped entirely as non-remnant vegetation in the State's Queensland Globe spatial data system (Figure 18). There are no parcels of vegetation identified as any regional ecosystem on the subject land, and it has been extensively cleared in the past for the agricultural use (grazing cattle). The land now has mostly acacia species (native and introduced) present, or extensive areas of pasture grass (Figures 19 and 20). The vegetation category over the entire lot is category X, which is exempt from requiring a permit to clear under the *Vegetation Management Act 1999*.

In the receiving environment the most common regional ecosystem vegetation type is RE 11.3.27c associated with the HES wetlands. This RE generally consists of mixed sedges or grasses including *Eleocharis* spp., *Nymphoides* spp., and *Phragmites australis* (common reed).

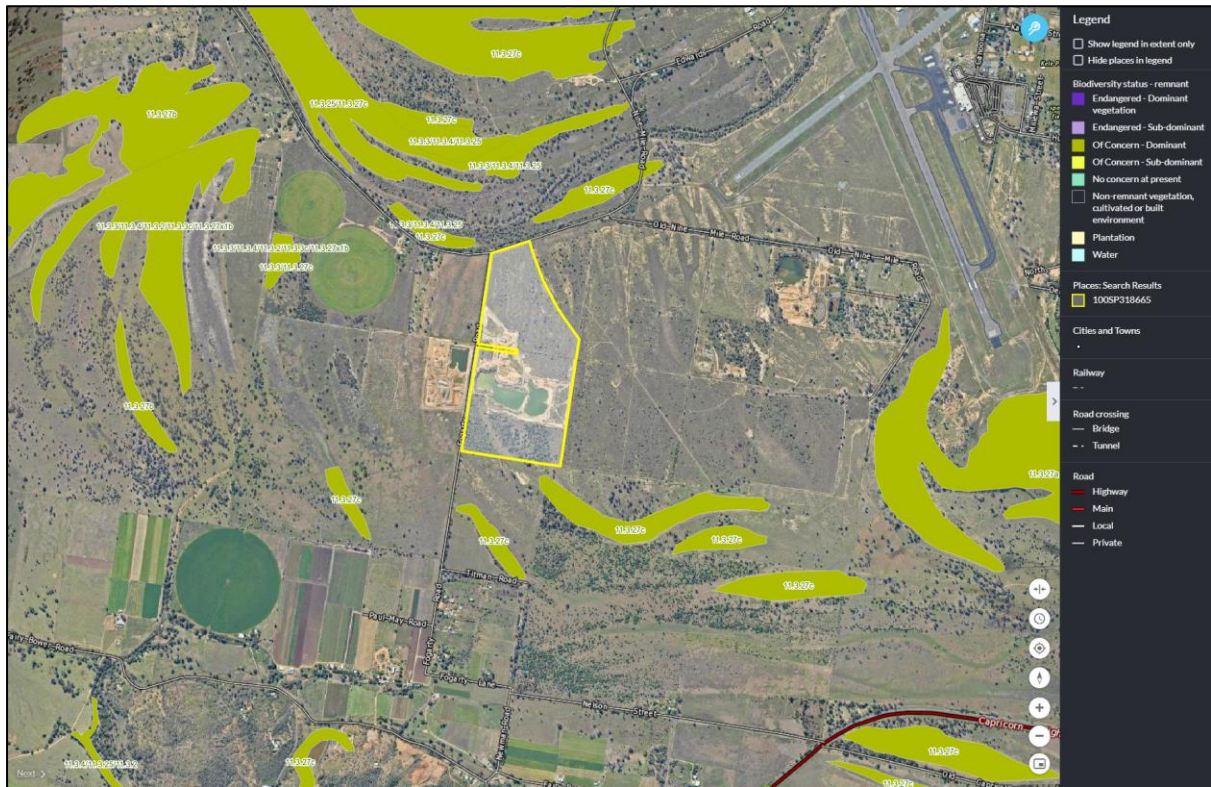


Figure 18. Regional ecosystem mapping layer from Queensland Globe®. Lot 100 SP318665 is shown as a yellow polygon and is mapped as non-remnant vegetation.



Figure 19. Typical ground cover over Lot 100 SP318665 after winter. The subject land is sparsely vegetated with mostly regrowth of non-remnant vegetation.



Figure 20. Photograph taken approximately 200 m south of the existing extractive pit facing northeast toward Mount Archer (in background). This is typical of the grass cover after an average wet season. All the trees in the photo are acacia spp.

4.4.2.2 Fauna

The subject land was cleared early last century to graze cattle, and trees have been kept to a minimum since. There is no identified wildlife habitat on the subject land, however the MSES layers on Queensland Globe indicate there is MSES wildlife habitat (threatened and special least concern animal) on the southernmost extent of the subject land. The mapped MSES that is wildlife habitat is shown as being associated with the HES wetland, which does not extend onto the subject land. Section 4.6 discusses the MSES mapping near and over the subject land in more detail.

4.4.3 Management of potential impacts

The potential impacts to land will be managed/mitigated by:

- Conducting the proposed activity by ensuring there are no releases of contaminants to land, by:
 - Managing chemicals appropriately, including handling responsibly and storing within a suitable secondary containment system.
 - Maintaining appropriate spill kits and ensuring staff are trained in using such.
 - Cleaning up chemical spills as soon as they occur.
- Adhering to established operational processes and procedures for extracting and processing sand.

- Maintaining the existing licensed 200 m buffer between the quarry footprint and the HES wetlands.
- Shaping the land around the quarry footprint to ensure overland flow from storms, high rainfall events and floods that originate upstream is diverted around the disturbed area.
- Revegetating disturbed areas as quickly as possible.
- Treating all rainwater that falls on the disturbed footprint for the quarry as contaminated water, and directing this water to a retention basin.
- Maintaining an appropriate freeboard in retention basins so there remains the capacity to assimilate significant stormwater flows into the existing system.
- Employing the use of minimal plant and equipment onsite.
- Ensuring vehicles, plant and equipment are maintained in an excellent state of repair and operated in accordance with manufacturer's specifications.
- Ensuring only experienced staff are permitted to operate key infrastructure such as the floating dredge and screening plant.
- Inducting all staff to ensure they are aware of environmental obligations under the EA and penalties that can potentially be imposed by not complying with conditions in the EA or wider obligations under the EP Act.

4.4.4 Summary of analysis of potential impact of the proposed activity on land, and provisions to protect the environmental values of the land environment

The proposed activity will implement appropriate mitigation strategies to prevent significant impact on the EVs of land.

By adhering to the measures described above to manage potential impacts on land from the activity, all of the performance outcomes prescribed in item two for the environmental objective for land as prescribed in the EP Regulation Schedule 8, Part 3, Division 1 will be met. Although there is no intention to cease conducting the proposed activities in the near future, upon cessation the land will be left in a condition that is safe, stable, non-polluting and able to sustain an appropriate land use after rehabilitation or restoration.

4.5 Waste

Mr Waardyk actively aims to minimise production of waste wherever possible. However, it is unavoidable that some waste products result from undertaking the extractive and screening ERAs.

All waste materials are, and will continue to be managed (recycled, reused or disposed of) in accordance with the requirements of the local authority (RRC) and DES. Mr Waardyk has been operating extractive and screening ERAs under prescribed conditions in an amalgamated project authority which includes conditions which require the appropriate management of waste. DES has undertaken compliance inspections at both of Mr Waardyk's licensed extractive activities and inspecting officers have not identified any issues with how Mr Waardyk manages waste.

4.5.1 Environmental management objectives

Schedule 8, Part 3, Division 1 of the EP Regulation prescribes the environmental objectives and performance outcomes for waste as follows:

Environmental Objective

Any waste generated, transported, or received as part of carrying out the activity is managed in a way that protects all environmental values.

Performance outcomes

1. *Both of the following apply—*
 - (a) *waste generated, transported or received is managed in accordance with the waste and resource management hierarchy in the ;*
 - (b) *if waste is disposed of, it is disposed of in a way that prevents or minimises adverse effects on environmental values.*

Schedule 8, Part 2, Section 2 of the EP Regulation states that the relevant environmental objective is achieved if either item 1 of the performance outcome for the environmental objective is achieved, or item 2 of the performance outcomes for the relevant environmental objective is achieved.

4.5.2 Management of potential impacts from waste

Mr Waardyk is aware of obligations to manage and dispose of waste in an appropriate manner that meets the prescribed requirements of an EA, and the broader obligations under the EP Act and the *Waste Reduction and Recycling Act 2011* (WRR Act).

General waste will be stored in closed industrial waste bins and removed by a waste contractor on an as necessary basis. Where plant and vehicle repairs are necessary and regulated waste is generated, it will be removed only by licensed regulated waste transporters and disposed at a facility that can lawfully accept the waste.

Mr Waardyk will maintain appropriate waste records for up to five years or the period prescribed in an EA.

4.5.3 Summary of analysis of waste management and potential impact on environmental values

Mr Waardyk is aware of the waste and resource management hierarchy prescribed in the WRR Act, and constantly strives to achieve best practice environmental management of waste generated while

conducting his activities. By adhering to lawful practice for waste management as described above, the proposed activity will meet item 1 of the performance outcome for managing waste as described in Schedule 8, Part 3, Division 1 of the EP Regulation.

4.6 Matters of State Environmental Significance

A MSES report was generated on 02 November 2022 and is provided in Appendix E. The report identifies the following MSES on the subject land:

- Wildlife habitat (endangered or vulnerable wildlife) over 0.01 ha (0.01% of subject land); and
- Wildlife habitat (special least concern) over 0.01 ha (0.01% of subject land)

Consulting Queensland Globe’s MSES mapping layers, the extent of encroachment of mapped wildlife habitat on Lot 100 SP318665 can be appreciated (Figure 21). The MSES wildlife habitat values mapped are associated with the oxbow lagoon to the south of Hardcore Sands which is also mapped as HES wetland. However, by establishing and maintaining a buffer of 200 m from the extractive footprint and the HES wetland, this small area of approximately 50 m² just inside the southern boundary line also protects this area of mapped MSES. The licensed footprint for the quarry can be seen in Schedule G in the EA (Appendix A of this report).

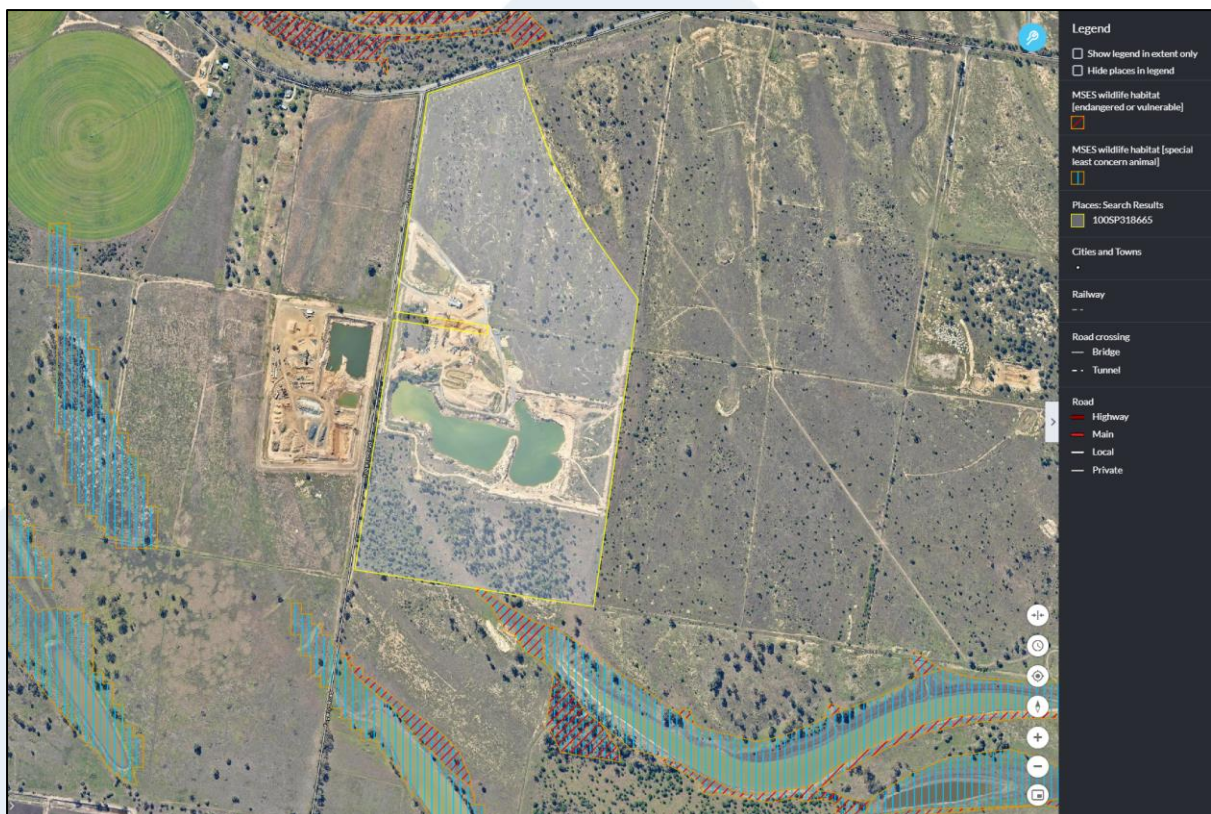


Figure 21. MSES wildlife habitat mapping showing the minor encroachment of 'endangered or vulnerable' and 'least concern animal' over the southern boundary line of Lot 100 SP318665 [Source: Queensland Globe®].

4.7 Rehabilitation upon cessation of the ERAs

The quarrying method at Hardcore Sands activity involves the use of a floating dredge to extract sand from the alluvial deposits located over the extensive Fitzroy River floodplain. The water table is always close to ground surface over this entire area at Fairy Bower, and water in the extractive pits is indistinguishable from groundwater. Sand is dredged to approximately 18 m below ground level, and there is very little sediment mixed with the sand. Almost all water dredged from the active extractive pit with sand is returned to the first extractive pit, which is now the retention basin. It is important to note that groundwater at this location on the Fitzroy River floodplain is plentiful, and the subject land is located outside of a groundwater management area regulated under the Water Act. Groundwater use at this location is not regulated under Queensland legislation.

Hardcore Sands has the luxury of having almost all material dredged from the extractive area being high quality river sand for which there is high demand for use as a construction material. Taking this material to a depth well below the height of the water table removes the ability to rehabilitate the extractive zone to the previous state as a terrestrial landscape. Rather, the intention is to leave extractive pits as agricultural water storages. Hardcore Sands will continue operating for many years, thereby providing the local building and road construction industries with high quality sand long into the future. However, as with any ERA where a footprint will remain following cessation of the activity, the intention is to remove built infrastructure and leave disturbed areas in a condition that is safe, stable, non-polluting, and fit for the intended subsequent use. The most likely end use for the facility is cattle grazing. The subject land is positioned firmly within the floodplain of the Fitzroy River, so no significant built infrastructure such as residential or commercial property will be constructed on site in the future. Due to the intention to continue operating the sand quarry for many years, a rehabilitation plan will not be developed at this time. Instead, as it becomes known that the activity will eventually cease by a particular date, a rehabilitation plan will be developed and implemented as required./.

5 Summary

This report addresses the two items related to environmental management in the information request issued by SARA by providing a description and analysis of the environmental risks and impacts that the proposal to increase the intensity of extraction and processing of sand at Hardcore Sands is likely to present. The environmental risks and impacts that have been considered are in relation to:

- Air
- Noise
- Water
- Land
- Waste

This environmental report demonstrates that the proposal to increase the intensity of the extractive ERAs will have an insignificant impact on the receiving environment. The mitigation strategies Hardcore Sands already implements and maintains (and will continue implementing and maintaining) whilst conducting the ERAs will achieve highly acceptable environmental outcomes.

6 Appendices

Appendix A – Environmental Authority EPPR01425013

Permit

Environmental Protection Act 1994

Environmental authority EPPR00236013

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: EPPR00236013

Environmental authority takes effect on 18 June 2020

Environmental authority holder

Name	Registered address
Paul Waardyk	26 Gremalis Dr PARKHURST QLD 4702 Australia

Environmentally relevant activity and location details

Environmentally relevant activities	Locations
ERA 16 - Extraction and Screening 1 Dredging, in a year, the following quantity of material, (c) more than 100,000t but not more than 1,000,000t. ERA 16 - Extraction and Screening 3: Screening, in a year, the following quantity of material, (b) more than 100,000t but not more than 1,000,000t.	Pink Lily Site Lot 40 PL4020, Lot 2 RP612164, Lot 3 RP618125, Lot 13 L16805, Lot 15 L16805 and Lot 16 L16805.
ERA 16 - Extraction and Screening 3: Screening, in a year, the following quantity of material (b) more than 100,000t but not more than 1,000,000t. ERA 16 - Extraction and Screening 2: Extracting, other than by dredging, in a year, the following quantity of material (b) more than 100,000t but not more than 1,000,000t.	Fairy Bower Site Lot 100 SP120491

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any

inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days);

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

- a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority-on the nominated day; or
- b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or
- c) otherwise-on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.



Clancy Mackaway
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Extraction, Energy and Resources
Department of Environment and Science
Phone: 1300 130 372
Email: palm@des.qld.gov.au

Date issued: 18 June 2020

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Conditions of environmental authority

Part 1: Dredging operations located at Pink Lily Road, Pink Lily

The environmentally relevant activities conducted at the locations as described above must be conducted in accordance with the following conditions.

Agency interest: General	
Condition number	Condition
A1	<p>Prior to the commencement of any environmentally relevant activity ('the activities') under this environmental authority, the holder of this environmental authority must:</p> <ul style="list-style-type: none"> a) develop an Integrated Environmental Management System (IEMS) which provides for the effective management by the holder of the actual and potential environmental impacts resulting from the carrying out of the activities; and b) implement and maintain the IEMS from the commencement of carrying out the activities.
A2	<p>The IEMS must provide for at least the following functions:</p> <ul style="list-style-type: none"> a) Training staff in the awareness of environmental issues related to carrying out the activity which must include at least: <ul style="list-style-type: none"> i. The environmental policy of the holder, so that all persons that carry out the activities are aware of all relevant commitments to environmental management; and ii. Any relevant environmental objectives and targets, so that all staff are aware of the relevant performance objectives and can work towards these; and iii. Control procedures to be implemented for routine operations for day to day activities to minimise likelihood of environmental harm, however occasioned or caused; and iv. Contingency plans and emergency procedures to be implemented for non-routine situations to deal with foreseeable risks and hazards including corrective responses to prevent and mitigate environmental harm (including any necessary site rehabilitation); and v. Organisational structure and responsibility to ensure that roles, responsibilities and authorities are appropriately defined to manage environmental issues effectively; and vi. Effective communication to ensure two-way communication on environmental matters between operational staff and higher management; and vii. Their obligations in respect of monitoring, notification and record keeping obligations under the IEMS and relevant environmental authorities and/or development approvals; and b) Monitoring of the release of contaminants into the environment including procedures, methods, record keeping and notification of results;

Environmental authority

	<ul style="list-style-type: none"> c) Conducting assessment of the environmental impact of any release of contaminants into the environment; d) Periodic conduct of energy audits and review of environmental performance and procedures adopted, not less frequently than every twelve months; and e) Waste prevention, treatment and disposal; and f) A program for continuous improvement.
A3	The holder of this environmental authority must not implement or amend an IEMS (including any environmental management plan) that contravenes any condition of this environmental authority or any development condition applicable to carrying out the activities.
A4	<p>In carrying out the environmentally relevant activities, you must take all reasonable and practicable measures to prevent and / or to minimise the likelihood of environmental harm being caused. Any environmentally relevant activity, that, if carried out incompetently, or negligently, may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this authority.</p> <p>NOTE: This authority authorises the environmentally relevant activity, it does not authorise environmental harm unless a condition contained within this authority explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.</p>
A5	<p>The holder must:</p> <ul style="list-style-type: none"> a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; and b) maintain such measures, plant and equipment in a proper and efficient condition; and c) operate such measures, plant and equipment in a proper and efficient manner.
A6	<p>From commencement of the activity, a Site Based Management Plan (SBMP) must be implemented. The SBMP must identify all sources of environmental harm, including but not limited to the actual and potential release of all contaminants, the potential impact of these sources and what actions will be taken to prevent the likelihood of environmental harm being caused. The SBMP must also provide for the review and 'continual improvement' in the overall environmental performance of all Environmentally Relevant Activities that are carried out.</p> <p>The site based management plan must address the following matters:</p> <ul style="list-style-type: none"> a) Environmental commitments - a commitment by senior management to achieve environmental goals. b) Identification of environmental issues and potential impacts. c) Control measures for routine operations to minimise likelihood of environmental harm. d) Contingency plans and emergency procedures for non-routine situations. e) Organisational structure and responsibility. f) Effective communication. g) Monitoring of the contaminant releases. h) Conducting environmental impact assessments. i) Record keeping. j) Periodic review of environmental performance and continual improvement.

Environmental authority

A7	The only form of dredging to be carried out is sand extraction as described in the application.
A8	The dredging activity and any disturbance to flora and fauna (both aquatic and terrestrial), rock bars or riffle areas that create natural pools or sand, gravel and clay in the bed of the waters must only be carried out on those areas designated on drawing number 010109/1 Revision 12, Graham Scott and Associates, Integrated Environmental Management System, Document No. 1, May 2001. Refer Schedule H – Figure 1
A9	The placement of dredged spoil may only occur to those areas designated on drawing number 010109/02 and drawing number 010109/3 Revision 12, Graham Scott and Associates, Integrated Environmental Management System, Document No. 1, May 2001. Refer Schedule H – Figure 2
G1	All complaints received must be recorded including investigations undertaken, conclusions formed and actions taken. This information must be made available to the administering authority on request.
G2	In consultation with the administering authority, cooperate with and participate in any community environmental liaison committee established in respect of either the site specifically, or the industrial estate where the site is located.

Agency interest: Air

Condition number	Condition
B1	The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activity must not cause a nuisance at any odour sensitive place.
B2	The release of dust and/or particulate matter resulting from the activity must not cause an environmental nuisance at any dust sensitive place.
B3	The release of contaminants to the atmosphere from a point source must only occur from those release points identified in Schedule B - Table 1 and must be directed vertically upwards without any impedance or hindrance.

Schedule B – Table 1

Source Description	Release Point and Stack Description
Medium Sand Dredge	RP1, RP2 - diesel exhaust
Booster Pump (Bank)	RP3 - diesel exhaust
Booster Pump (Floating)	RP4 - diesel exhaust
Medium Sand Plant	RP6, RP7 - diesel exhaust
Fine Sand Plant	RP8 - diesel exhaust
Fine Sand Dredge	RP9, RP10 - diesel exhaust
Gravel Plant	RP5, RP11 - diesel exhaust

Agency interest: Water

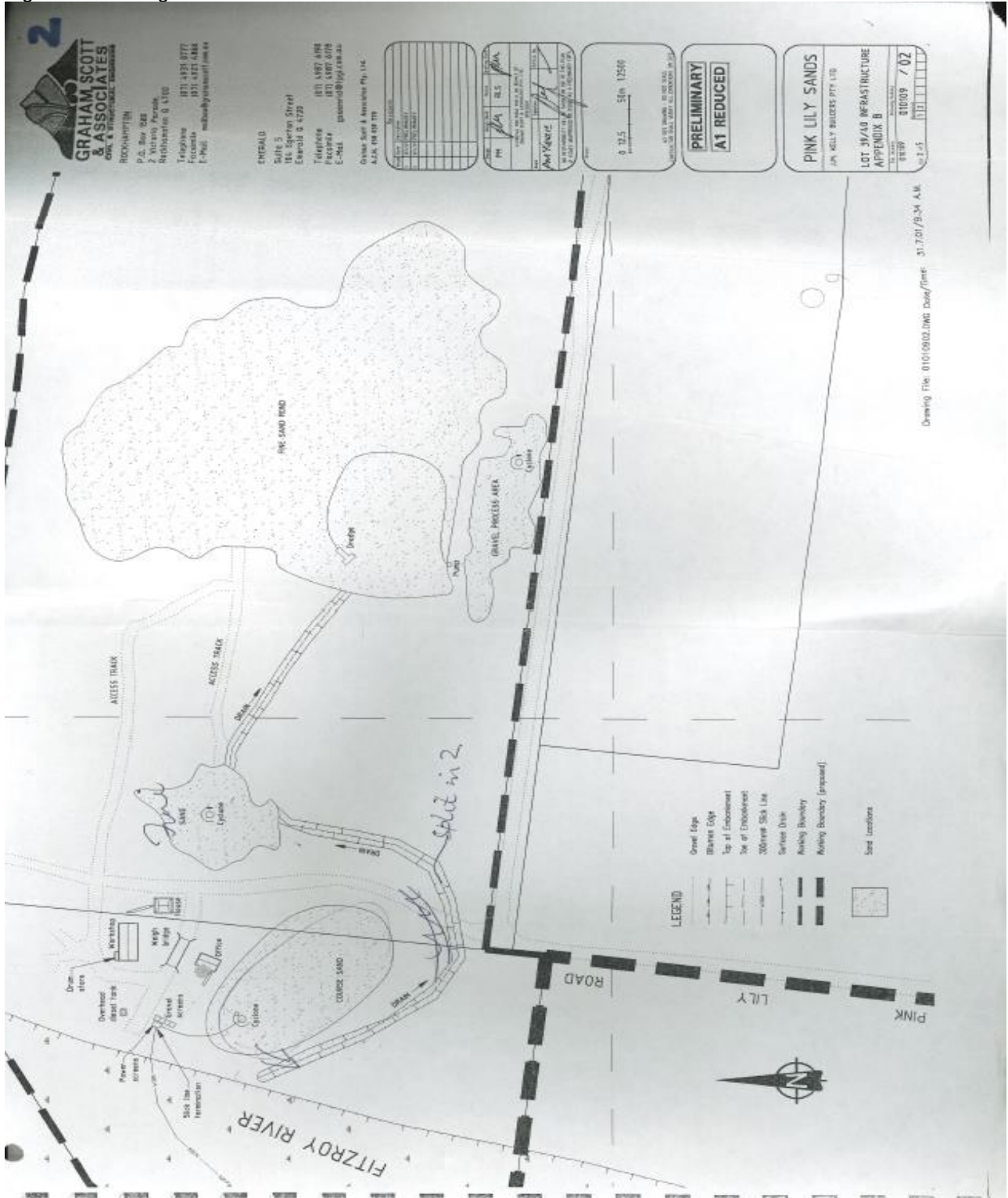
Environmental authority

Condition number	Condition
C1	Prevent the release of sediment to waters or a build-up of sediment in any stormwater drain.
C2	Water velocities through temporary watercourse diversions around works area must be maintained similar to pre-work velocities during such diversions and must be reinstalled once dredging works are completed.
C3	Contaminants must not be released from the site to any waters or the bed and banks of any waters.
C4	There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.
Agency interest: Noise	
Condition number	Condition
D1	Noise from activities must not cause an environmental nuisance at any noise affected premises.
Agency interest: Land	
Condition number	Condition number
F1	<p>The authorised place must be rehabilitated (including all disturbed areas such as slopes, borrow pits, stockpile and screening areas) in a manner such that:</p> <ol style="list-style-type: none"> suitable native species of vegetation are planted and established; potential for erosion of the site is minimised; the quality of stormwater, water and seepage released from the site is such that releases of contaminants such as suspended solids, turbidity, total dissolved salts, pH, total iron, total aluminium, and total manganese are not likely to cause environmental harm; the likelihood of environmental nuisance being caused by release of dust is minimised; the water quality of any residual water bodies meets criteria for subsequent uses and does not have potential to cause environmental harm; the final landform is stable and not subject to slumping; and any actual and potential acid sulfate soils in or on the site are either not disturbed; or, submerged, or treated so as to not be likely to cause environmental harm.
F2	Rehabilitation of disturbed areas must take place progressively as works are staged and new areas of extraction are commenced.

Environmental authority

F3	Contaminants must not be released to land.
F4	Spillage of all chemicals and fuels must be contained within an on-site containment system and controlled in a manner that prevents environmental harm. NOTE: All petroleum product storage's must be designed, constructed and maintained in accordance with AS 1940 - Storage and Handling of Flammable and Combustible Liquids.
Agency interest: Waste	
Condition number	Condition
E1	All regulated waste removed from the site must be removed by a person who holds a current authority to transport such waste under the provisions of the <i>Environmental Protection Act 1994</i> .

Figure 2: Drawing number 010109/3



Environmental authority

Part 2: Extraction operations located at Nine Mile Road, Fairy Bower

The environmentally relevant activities conducted at the locations as described above must be conducted in accordance with the following conditions.

Agency interest: General																																																																																															
Condition number	Condition																																																																																														
A1	<p>Activities conducted under this environmental authority must not be conducted contrary to any of the following limitations:</p> <p>a) The amount of sand extracted or screened from the quarry in any one year is to be no more than 250,000 tonnes.</p> <p>b) Activities must only occur within the additional areas and existing development permit area defined in Schedule G – Site Plan reference 7379-01-MCU-A with the following associated GPS Co-ordinates delineating the boundaries of the additional areas and existing development permit area:</p> <table border="1"> <thead> <tr> <th>Corner</th> <th>Latitude</th> <th>Longitude</th> <th>Corner</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-23.387689</td> <td>150.451398</td> <td>15</td> <td>-23.395588</td> <td>150.454111</td> </tr> <tr> <td>2</td> <td>-23.387173</td> <td>150.452172</td> <td>16</td> <td>-23.395841</td> <td>150.452809</td> </tr> <tr> <td>3</td> <td>-23.386301</td> <td>150.452675</td> <td>17</td> <td>-23.395998</td> <td>150.452444</td> </tr> <tr> <td>4</td> <td>-23.386067</td> <td>150.452687</td> <td>18</td> <td>-23.396198</td> <td>150.452171</td> </tr> <tr> <td>5</td> <td>-23.386310</td> <td>150.452917</td> <td>19</td> <td>-23.396315</td> <td>150.452054</td> </tr> <tr> <td>6</td> <td>-23.386328</td> <td>150.453076</td> <td>20</td> <td>-23.396588</td> <td>150.451841</td> </tr> <tr> <td>7</td> <td>-23.388094</td> <td>150.453781</td> <td>21</td> <td>-23.396849</td> <td>150.451763</td> </tr> <tr> <td>8</td> <td>-23.389454</td> <td>150.454563</td> <td>22</td> <td>-23.396677</td> <td>150.450685</td> </tr> <tr> <td>9</td> <td>-23.391772</td> <td>150.456284</td> <td>23</td> <td>-23.396043</td> <td>150.450016</td> </tr> <tr> <td>10</td> <td>-23.396030</td> <td>150.455592</td> <td>24</td> <td>-23.391225</td> <td>150.450750</td> </tr> <tr> <td>11</td> <td>-23.395867</td> <td>150.455360</td> <td>25</td> <td>-23.391536</td> <td>150.452955</td> </tr> <tr> <td>12</td> <td>-23.395739</td> <td>150.455089</td> <td>26</td> <td>-23.391350</td> <td>150.452985</td> </tr> <tr> <td>13</td> <td>-23.395675</td> <td>150.454847</td> <td>27</td> <td>-23.391019</td> <td>150.450786</td> </tr> <tr> <td>14</td> <td>-23.395624</td> <td>150.454529</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Corner	Latitude	Longitude	Corner	Latitude	Longitude	1	-23.387689	150.451398	15	-23.395588	150.454111	2	-23.387173	150.452172	16	-23.395841	150.452809	3	-23.386301	150.452675	17	-23.395998	150.452444	4	-23.386067	150.452687	18	-23.396198	150.452171	5	-23.386310	150.452917	19	-23.396315	150.452054	6	-23.386328	150.453076	20	-23.396588	150.451841	7	-23.388094	150.453781	21	-23.396849	150.451763	8	-23.389454	150.454563	22	-23.396677	150.450685	9	-23.391772	150.456284	23	-23.396043	150.450016	10	-23.396030	150.455592	24	-23.391225	150.450750	11	-23.395867	150.455360	25	-23.391536	150.452955	12	-23.395739	150.455089	26	-23.391350	150.452985	13	-23.395675	150.454847	27	-23.391019	150.450786	14	-23.395624	150.454529			
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A2	All reasonable and practicable measures must be taken to prevent or minimise environmental harm caused by the activities.																																																																																														

Environmental authority

A3	Other than as permitted by this environmental authority, the release of a contaminant into the environment must not occur.
A4	If you become aware of any adverse impact on an environmental value you must notify the administering authority in writing of the full details of the adverse impact within 24 hours of becoming aware of the impact.
A5	Any breach of a condition of this environmental authority must be reported to the administering authority within 24 hours of becoming aware of the breach and record full details of the breach and any subsequent actions.
A6	When required by the administering authority, monitoring must be undertaken in the manner prescribed by the administering authority, to investigate a complaint of environmental nuisance arising from the activity. The monitoring results must be provided within 10 business days to the administering authority upon its request.
A7	The activity must be undertaken in accordance with written procedures that: <ol style="list-style-type: none"> 1. identify potential risks to the environment from the activity during routine operations, closure and an emergency; and 2. establish and maintain control measures that minimise the potential for environmental harm; and 3. ensure plant, equipment and measures are maintained in a proper and effective condition; and 4. ensure plant, equipment and measures are operated in a proper and effective manner; and 5. ensure that staff are trained and aware of their obligations under the <i>Environmental Protection Act 1994</i>; and 6. ensure that reviews of environmental performance are undertaken at least annually.
A8	All information and records that are required by the conditions of this environmental authority must be kept for a period of at least 5 years.
A9	The activity must not cause environmental nuisance at a nuisance sensitive place.
A10	The activity must not cause the release of dust or particulates that cause environmental nuisance beyond the boundary of the site.
A11	Chemicals and fuels in containers of greater than 15 litres must be stored within a secondary containment system.
Agency interest: Air	
Condition number	Condition
B1	Odours or airborne contaminants which are noxious or offensive or otherwise unreasonably disruptive to public amenity or safety must not be released to any nuisance sensitive place or commercial place.
Agency interest: Water	
Condition number	Condition

Environmental authority

C1	Contaminants must not be released to waters, including groundwater.
C2	Stormwater contaminated by the activity must be managed to minimise or prevent any adverse impacts on the values of the receiving environment.
C3	Ponds used for the storage or treatment of wastewater or wastes must be constructed, installed and maintained to: a) prevent any release of wastewater or wastes from the ponds to any waters other than during wet weather events b) minimise overflows during wet weather ensure the stability of the pond structure.
C4	Erosion and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment.
C5	The discharge of waters from flood events is permitted, provided: a) no action is undertaken to cause the discharge, or increase the volume of the discharge; and b) all reasonable and practicable measures have been undertaken to minimise any environmental harm associated with the discharge from the site.
C6	The release of waters / contaminants from the site under condition C5, must be notified to the administering authority as soon as practicable within 24 hours of the discharge.
C7	The discharge to waters permitted under condition C5 must not contain any other properties at a concentration capable of causing environmental harm.
C8	The discharge to waters permitted under condition C5 must not produce any slick or other visible evidence of oil or grease, scum, litter or other visually objectionable matter.
C9	Stormwater that is not contaminated by the activity must be diverted away from areas where it may become contaminated by the activity. Stormwater that is contaminated by the activity must be directed to a treatment system.
C10	A groundwater monitoring program must be designed and implemented by an appropriately qualified person(s) to monitor the effects of the activity on groundwater.
C11	The groundwater monitoring program required by condition C10, must include the following: (a) be able to determine the impacts of the licensed activity on the groundwater quality; and (b) include, but not be limited to, a sufficient number of bores (minimum of three) installed at locations and depths which yield representative groundwater samples from at least the upper-most aquifer so as to: i. establish the quality of groundwater that has not been affected by seepage or drainage of contaminants to groundwater from the activity; and ii. detect any seepage of contaminants to groundwater from the licensed place; and (c) include monitoring of background groundwater quality, hydraulically up-gradient of any release of contaminants to groundwater; and (d) include monitoring of downstream groundwater quality, hydraulically down gradient of all ponds/dredged areas, or chemical storage areas; (e) include, but not limited to, monthly monitoring of the quality of groundwater to detect any possible release(s) of contaminants; and (f) monthly monitoring of the standing water level at all monitoring bores; and (g) consider the potential use of groundwater in the vicinity.

Environmental authority

C12

An appropriately qualified person(s) must monitor, interpret and record all parameters that are required to be monitored by condition C11 as part of the groundwater monitoring program, in the manner provided, under *Table 1 – Groundwater Monitoring* and the associated monitoring requirements.

Table 1 – Groundwater Monitoring

Parameter	Measurement (units)	Minimum frequency	Monitoring location
pH	N/A	Monthly	B151476, B151477 and B151478
Electrical Conductivity	microsiemens/centimetre ($\mu\text{S}/\text{cm}$)	Monthly	B151476, B151477 and B151478
Standing Water Level	Decimetre (dm)	Monthly	B151476, B151477 and B151478

Associated monitoring requirements

- Monitoring locations must be located at the following GPS Co-ordinates:
B151476 — monitoring bore 151476. Latitude -23.386389, Longitude 150.448056
B151477 — monitoring bore 151477. Latitude -23.386667, Longitude 150.446667
B151478 — monitoring bore 151478. Latitude -23.392222, Longitude 150.451667
- Monitoring must be undertaken any time the activity is in operation.
- All groundwater monitoring must be conducted in accordance with the current edition of the administering authority's Monitoring and Sampling Manual.
- All monitoring devices must be effectively calibrated and maintained.
- Measurement of groundwater standing water levels must be undertaken prior to any disturbance by sampling, and must be reported as the depth in metres from the established reference point to the water surface within the bore.
- Each groundwater monitoring bore must be fitted with a locked cap at all times other than when sampling is being undertaken.
- All determinations of the quality of the groundwater must employ analytical practical quantification limits sufficiently low enough to enable comparisons to be made against water quality objectives/limits relevant to the particular water quality characteristic.

Agency interest: Noise

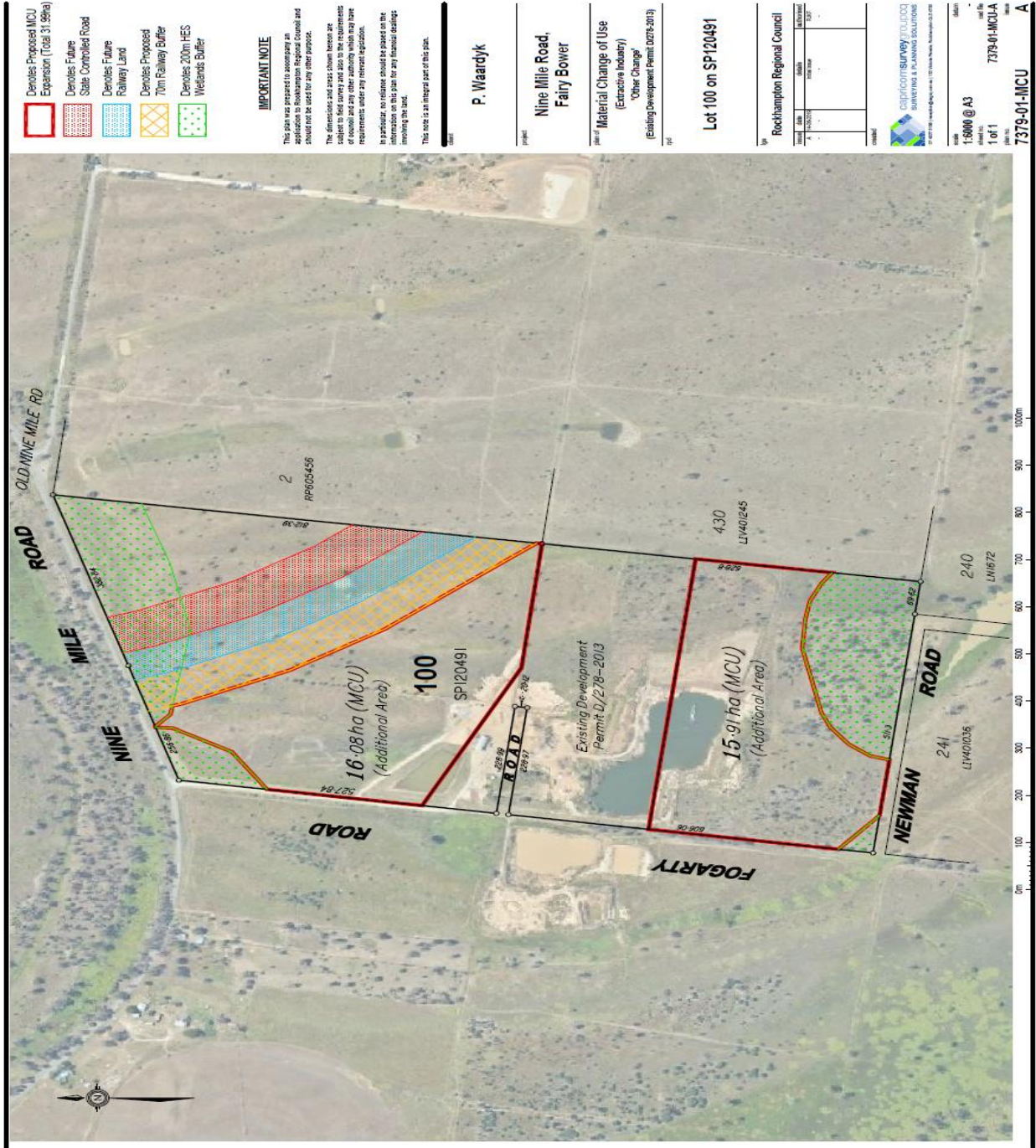
Condition number	Condition
D1	Noise generated by the activity must not cause environmental nuisance to any sensitive place or commercial place.
D2	The activity must not cause audible noise: a) on a business day or Saturday, before 7.00am or after 7.00pm b) on any other day, before 8.00am or after 7.00pm at any of the following places: a) a dwelling, mobile home or caravan park, residential marina, motel, hotel or hostel or other residential premises

Environmental authority

	b) a kindergarten, school, university, library, childcare centre or other educational institution a medical centre or hospital.
Agency interest: Land	
Condition number	Condition number
F1	Contaminants must not be released to land.
F2	Acid sulfate soils, acid-producing rock and marine sediments must not be processed.
F3	Land that has been disturbed for activities conducted under this environmental authority must be rehabilitated in a manner such that: <ol style="list-style-type: none"> 1. suitable species of vegetation for the location are established and sustained for earthen surfaces; 2. potential for erosion is minimised; 3. the quality of water released from the site, including seepage, does not cause environmental harm; 4. potential for environmental nuisance caused by dust is minimised; 5. the water quality of any residual water body does not have potential to cause environmental harm; 6. the final landform is stable and protects public safety.
F4	Rehabilitation of disturbed areas required under condition F3, must take place progressively as works are staged and new extraction areas are commenced.
Agency interest: Waste	
Condition number	Condition
E1	All waste generated in carrying out the activity must be reused, recycled or lawfully disposed of offsite.
E2	Waste must not be burnt.

Schedule G – Approved Plans

Site Plan reference 7379-01-MCU-A



Environmental authority

Part 3: Definitions

Words and phrases used throughout this environmental authority are defined below except where identified in the *Environmental Protection Act 1994* or its Regulations and Environmental Protection Policies. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the Macquarie Dictionary.

Word or Phrase	Definition
Activity	means the environmentally relevant activities, whether resource activities or prescribed activities, to which the environmental authority relates.
Administering Authority	means the Department of Environment and Science or its successor or predecessors.
Authorised Place	means the place authorised under this environmental authority/development approval for the carrying out of the specified environmentally relevant activities.
This Authority	means this environmental authority/development approval.
Approval	means 'notice of development application decision' or 'notice of concurrence agency response' under the <i>Integrated Planning Act 1997</i> .
Background	means noise, measured in the absence of the noise under investigation, as $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the time period of not less than 15 minutes, using Fast response
Boundary	means within 1m of the cadastral boundary of the approved place.
Commercial Place	means a place used as an office or for business or commercial purposes.
Dredge Spoil	means material taken from the bed or banks of waters by using dredging equipment or other equipment designed for use in extraction of earthen material.
Dust Sensitive Place	means: <ul style="list-style-type: none"> a) a dwelling, mobile home or caravan park, residential marina or other residential place; - a motel, hotel or hostel; b) a kindergarten, school, university or other educational institution; a medical centre or hospital; c) a protected area; a park or gardens; or d) a place used as an office or for business or commercial purposes.

Environmental authority

Word or Phrase	Definition
	and includes the curtilage of any such place.
Dwelling	means any of the following structures or vehicles that is principally used as a residence: <ul style="list-style-type: none"> a) a house, unit, motel, nursing home or other building or part of a building; b) a caravan, mobile home or other vehicle or structure on land; or c) a water craft in a marina.
Environmental nuisance	(the Act) is unreasonable interference or likely interference with an environmental value caused by— <ul style="list-style-type: none"> a) aerosols, fumes, light, noise, odour, particles or smoke; or b) an unhealthy, offensive or unsightly condition because of contamination; or c) another way prescribed by regulation.
Environmental value	(the Act) is— <ul style="list-style-type: none"> a) a quality or physical characteristic of the environment that is conducive to ecological health or public b) amenity or safety; or c) another quality of the environment identified and declared to be an environmental value under an d) environmental protection policy or regulation.
Intrusive Noise	means noise that, because of its frequency, duration, level, tonal characteristics impulsiveness or vibration: <ul style="list-style-type: none"> a) is clearly audible to, or can be felt by, an individual; and b) annoys the individual. <p>In determining whether a noise annoys an individual and is unreasonably intrusive, regard must be given to Australian Standard 1055.2-1997 Acoustics – Description and Measurement of Environmental Noise – Part 2 – Application to Specific Situations.</p>
Land	In the "land schedule" of this document means land excluding waters and the atmosphere.
$L_{Aeq\ adj,T}$	means the adjusted A weighted equivalent continuous sound pressure level measures on fast response, adjusted for tonality and impulsiveness, during the time period T, where T is measured for a period no less than 15 minutes when the activity is causing a steady state noise, and no shorter than 1 hour when the approved activity is causing an intermittent noise.
$MaxL_{pA,T}$	means the maximum A-weighted sound pressure level measured over a time period T of not less than 15 minutes, using Fast response.
Measures	has the broadest interpretation and includes plant, equipment, physical objects, monitoring, procedures, actions, directions and competency.

Environmental authority

Word or Phrase	Definition
Nuisance Sensitive Place	<p>includes:</p> <ul style="list-style-type: none"> a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or b) a motel, hotel or hostel; or c) a kindergarten, school, university or other educational institution; or d) a medical centre or hospital; or e) a protected area under the Nature Conservation Act 1992, the Marine Parks Act 1992 or a World Heritage Area; or f) a public thoroughfare, park or gardens; or g) a place used as a workplace, an office or for business or commercial purposes. <p>and includes a place within the curtilage of such a place reasonably used by persons at that place.</p>
Noise Affected Premises	means a “noise sensitive place” or a “commercial place”.
Noise sensitive place	<p>means:</p> <ul style="list-style-type: none"> a) a dwelling, mobile home or caravan park, residential marina or other residential premises; or b) a motel, hotel or hostel; or c) a kindergarten, school, university or other educational institution; or d) a medical centre or hospital; or e) a protected area; or f) a park or gardens. <p>and includes the curtilage of such place.</p>
Odour Sensitive Place	has the same meaning as a Dust Sensitive Place.
Offensive	means causing offence or displeasure; is unreasonably disagreeable to the sense; disgusting, nauseous or repulsive.
Prescribed contaminants	means contaminants listed within Schedule 10 of the Environmental Protection Regulation 2019.
Protected Area	<p>means:</p> <ul style="list-style-type: none"> a) a protected area under the <i>Nature Conservation Act 1992</i>; or b) a marine park under the <i>Marine Parks Act 2004</i>; or c) a World Heritage Area.
Sensitive place	includes the following and includes a place within the cartilage of such a place reasonably used by persons at that place:
Site	

Environmental authority

Word or Phrase	Definition
	means the place to which this environmental authority relates or the premises to which this development approval relates.
Waters	includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.
You	means the holder of this Environmental Authority or owner / occupier of the land which is the subject of this Development Approval.

END OF ENVIRONMENTAL AUTHORITY

Appendix B – SDAP Responses – State Codes 22 and 9

State code 22: Environmentally relevant activities

Guideline – SDAP State code 22: Environmentally Relevant Activities provides direction on how to address this code.

Table 22.1: All development

Performance outcomes	Acceptable outcomes	Response
All ERAs		
PO1 Development is suitably located and designed to avoid or mitigate environmental harm to the acoustic environment .	AO1.1 Development meets the acoustic quality objectives for sensitive receptors identified in the Environmental Protection (Noise) Policy 2019.	The quarry holds a development approval and environmental authority which permit extraction of sand at the location. The only change to the activity will be an increase in the rate of extraction and processing. Refer to section 4.2 in the above environmental report which considers the acoustic quality objectives in the EPP Noise.
PO2 Development is suitably located and designed to avoid or mitigate environmental harm to the air environment .	AO2.1 Development meets the air quality objectives of the Environmental Protection (Air) Policy 2019.	The quarry holds a development approval and environmental authority which permit extraction of sand at the location. The only change to the activity will be an increase in the rate of extraction and processing. Refer to section 4.1 in this environmental report which discusses the air quality objectives in the EPP Air.
PO3 Development (other than intensive animal industry for poultry farming), is suitably located and designed to avoid or mitigate environmental harm on adjacent sensitive land uses caused by odour.	No acceptable outcome is prescribed.	The quarry holds a development approval and environmental authority which permit extraction of sand at the location. The only change to the activity will be an increase in the rate of extraction and processing. Refer to section 4.1.3.2 in this environmental report for how potential impacts from odour will be managed/mitigated.

Performance outcomes	Acceptable outcomes	Response
<p>PO4 Development is suitably located and designed to avoid or mitigate environmental harm to the receiving waters environment.</p>	<p>AO4.1 Development meets the management intent, water quality guidelines and objectives of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019.</p>	<p>The quarry holds a development approval and environmental authority which permit extraction of sand at the location. The only change to the activity will be an increase in the rate of extraction and processing. Potential impacts to waters and management strategies/mitigation measures for preventing impacts to waters in the receiving environment are discussed in section 4.3 in this environmental report.</p>
<p>PO5 Development is designed to include elements which:</p> <ol style="list-style-type: none"> 1. prevent or minimise the production of hazardous contaminants and waste as by-products; or 2. contain and treat hazardous contaminants on-site rather than releasing them into the environment; and 3. provide secondary containment to prevent the accidental release of hazardous contaminants to the environment from spillage or leaks. 	<p>No acceptable outcome is prescribed.</p>	<p>The quarry holds a development approval and environmental authority which permit extraction of sand at the location. The only change to the activity will be an increase in the rate of extraction and processing. No hazardous contaminants/waste is generated by the activity. Where chemicals are stored on site, they are stored appropriately within a secondary containment system.</p>
<p>PO6 Environmentally hazardous materials located on-site are stored to avoid or minimise their release into the environment due to inundation during flood events.</p>	<p>No acceptable outcome is prescribed.</p>	<p>Where chemicals are stored on site, they are stored appropriately within a secondary containment system</p>
<p>All development – matters of state environmental significance</p>		

Performance outcomes	Acceptable outcomes	Response
<p>PO7 Development is designed and sited to:</p> <ol style="list-style-type: none"> 1. avoid impacts on matters of state environmental significance; or 2. minimise and mitigate impacts on matters of state environmental significance after demonstrating avoidance is not reasonably possible; and 3. provide an offset if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable significant residual impact on a matter of state environmental significance. <p>Statutory note: For Brisbane core port land, an offset may only be applied to development on land identified as E1 Conservation/Buffer, E2 Open Space or Buffer/Investigation in the Brisbane Port LUP precinct plan.</p>	<p>No acceptable outcome is prescribed.</p>	<p>The quarry holds a development approval and environmental authority which permit extraction of sand at the location. The only change to the activity will be an increase in the rate of extraction and processing. The ERAs will be conducted in a manner that will prevent impacts on any MSES. An appropriate buffer between the extractive footprint and MSES in the receiving environment has already been conditioned in the existing EA.</p>
<p>Intensive animal industry – poultry farming (ERA 4(2))</p>		
<p>PO8 Poultry farming development (where farming more than 200,000 birds) is suitably located and designed to avoid or mitigate environmental harm on adjacent sensitive land uses, caused by odour.</p>	<p>AO8.1 For poultry farming involving 300,000 birds or less, development meets the separation distances as determined using the S-factor methodology to:</p> <ol style="list-style-type: none"> 1. a sensitive land use in a rural zone; and 2. boundary of a non-rural zone. <p>OR</p> <p>AO8.2 Development meets the separation distances as determined by odour modelling using the following criteria:</p> <ol style="list-style-type: none"> 1. 2.5 odour units, 99.5 percent, 1 hour average for a sensitive land use in a rural zone; or 2. 1.0 odour units, 99.5 percent, 1 hour average for the boundary of a non-rural zone. 	<p>Not applicable.</p>

State code 9: Great Barrier Reef wetland protection areas

[State Development Assessment Provisions Guideline: State code 9: Wetland protection areas](#) which provides direction on how to address this code.

Table 9.1: Development with an acceptable outcome

Performance outcomes	Acceptable outcomes	Response
General		
PO1 Development maintains or improves wetland environmental values and native vegetation within the wetland and the buffer .	AO1.1 The buffer surrounding a wetland has a minimum width of: <ol style="list-style-type: none"> 200 metres, where the wetland is located outside a prescribed urban area; or 50 metres, where the wetland is located within a prescribed urban area. 	The proposed development is located outside of a prescribed urban area, therefore a minimum buffer width of 200 m is required as an acceptable outcome. A 200 m minimum width between the footprint of the extractive and screening environmentally relevant activities (ERAs) and the high ecological significance (HES) wetland will always be maintained.

Table 9.2: Development with no acceptable outcome

Performance outcomes	Response
General	
PO2 Development is not carried out in a wetland in a wetland protection area .	The development is not occurring in a wetland protection area, and is outside of the minimum buffer width distance of 200 m stated in this SDAP as an acceptable outcome.
Hydrology	
PO3 Development maintains or improves the existing surface and groundwater hydrology in a wetland protection area .	The proposal to increase the intensity of extraction will have no impact on existing surface or groundwater hydrology. The footprint for this quarry will not alter and has already been approved in a previous development application.
Water quality	

Performance outcomes	Response
PO4 Development does not unacceptably impact the water quality of the wetland in the wetland protection area and in the wetland buffer .	There will be no releases of water from site to any wetlands.
PO5 Development does not use the wetland in the wetland protection area for stormwater treatment.	No wetlands will be used to treat stormwater.
Land degradation	
PO6 Development is located and designed to protect the wetland protection area from land degradation .	The footprint for this quarry will not change from that already approved.
Fauna management	
PO7 Development protects wetland fauna from any impacts associated with noise, light or visual disturbance .	A suitable buffer has been established between the quarry and the mapped wetlands. The buffer was approved as part of the last development application to expand the footprint of the quarry. The footprint will not change as a result of this application. Only the rate of extraction is proposed to increase.
PO8 Development protects the movement of wetland fauna within and through a wetland protection area .	This application relates to increasing the intensity of sand extraction from an already approved footprint within a wetland protection area. No alteration to the existing licensed footprint will occur, thus the 200 m buffer between the quarry footprint and mapped HES wetlands will be preserved.
PO9 Development does not introduce pest plants, pest animals or exotic species into a wetland and its buffer .	Quarry trucks are limited to operating on formed roads, thus the risk of collecting weed seed is negligible. Regardless, Mr Waardyk regularly inspects the quarry for weed species that may establish and removes them in a timely manner. j
Matters of state environmental significance	
<p>PO10 Development outside the wetland is designed and sited to:</p> <ol style="list-style-type: none"> 1. avoid impacts on matters of state environmental significance; or 2. minimise and mitigate impacts on matters of state environmental significance after demonstrating avoidance is not reasonably possible; and 3. provide an offset if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable significant residual impact on a matter of state environmental significance. <p>Statutory note: For Brisbane core port land, an offset may only be applied to development on land identified as E1 Conservation/Buffer, E2 Open Space or Buffer/Investigation in the Brisbane Port LUP precinct plan.</p> 	The quarry footprint has been established with a suitable buffer to avoid impacting on MSES.

Appendix C – BoM wind roses for Rockhampton Aero (9:00 AM and 3:00 PM)

Rose of Wind direction versus Wind speed in km/h (01 Apr 1939 to 05 Apr 2016)

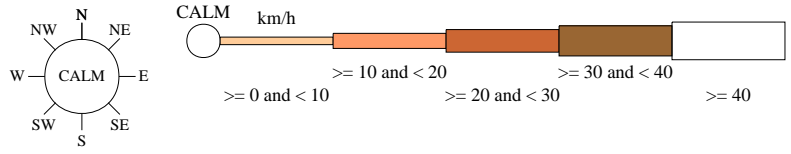
Custom times selected, refer to attached note for details

ROCKHAMPTON AERO

Site No: 039083 • Opened Jan 1939 • Still Open • Latitude: -23.3753° • Longitude: 150.4775° • Elevation 10.m

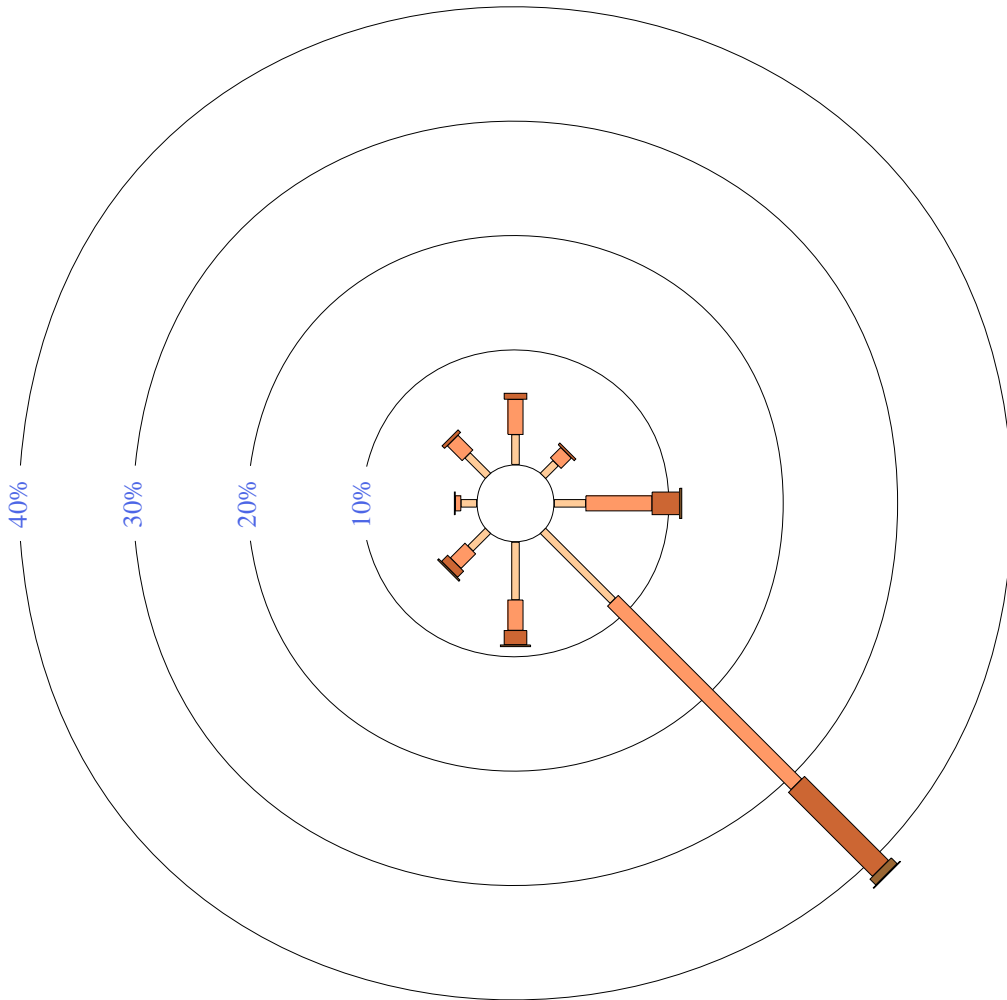
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



9 am
27955 Total Observations

Calm 17%



Rose of Wind direction versus Wind speed in km/h (01 Apr 1939 to 05 Apr 2016)

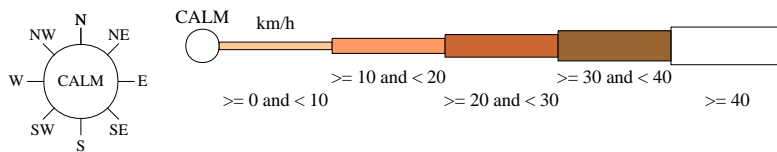
Custom times selected, refer to attached note for details

ROCKHAMPTON AERO

Site No: 039083 • Opened Jan 1939 • Still Open • Latitude: -23.3753° • Longitude: 150.4775° • Elevation 10.m

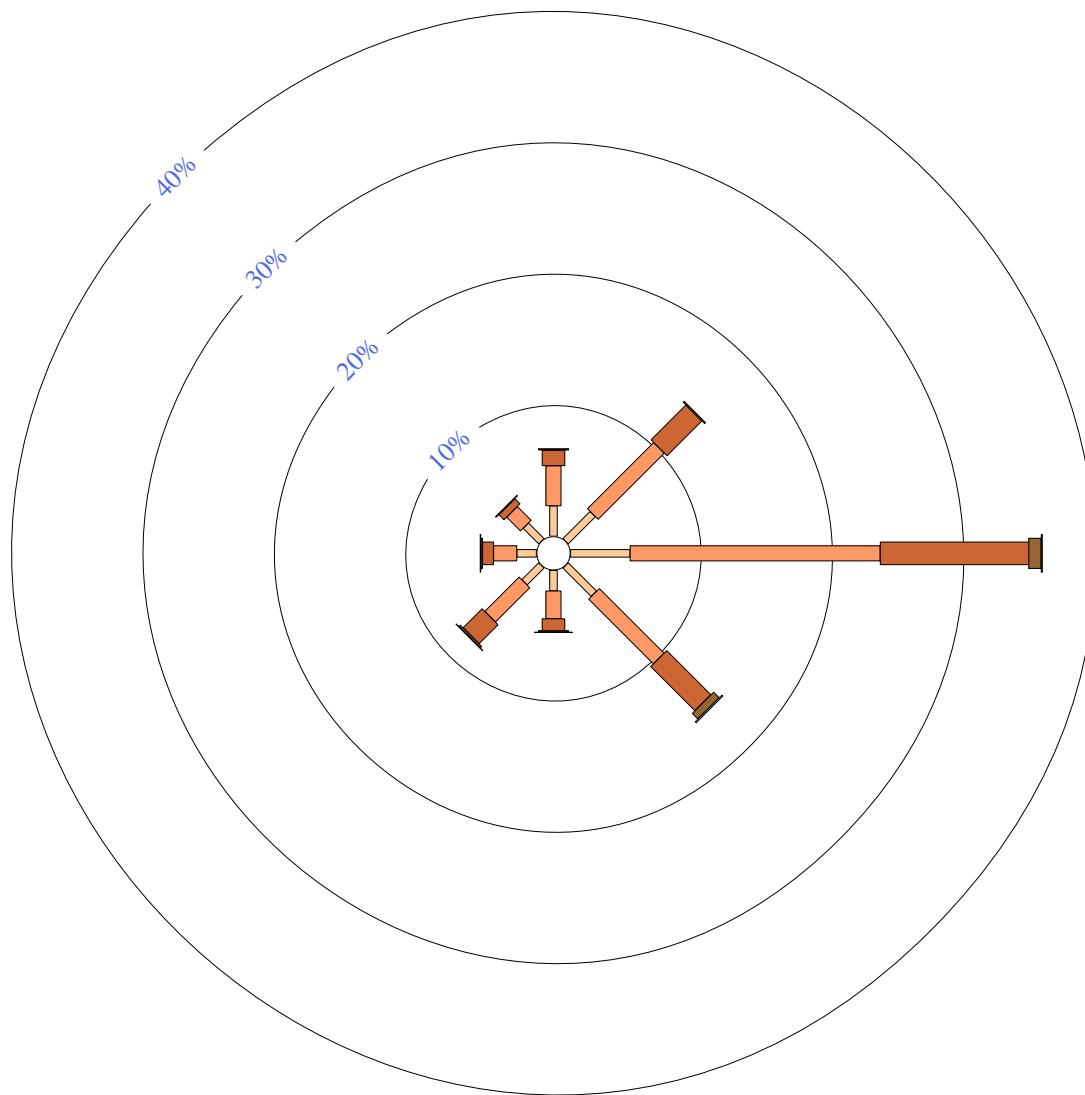
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.

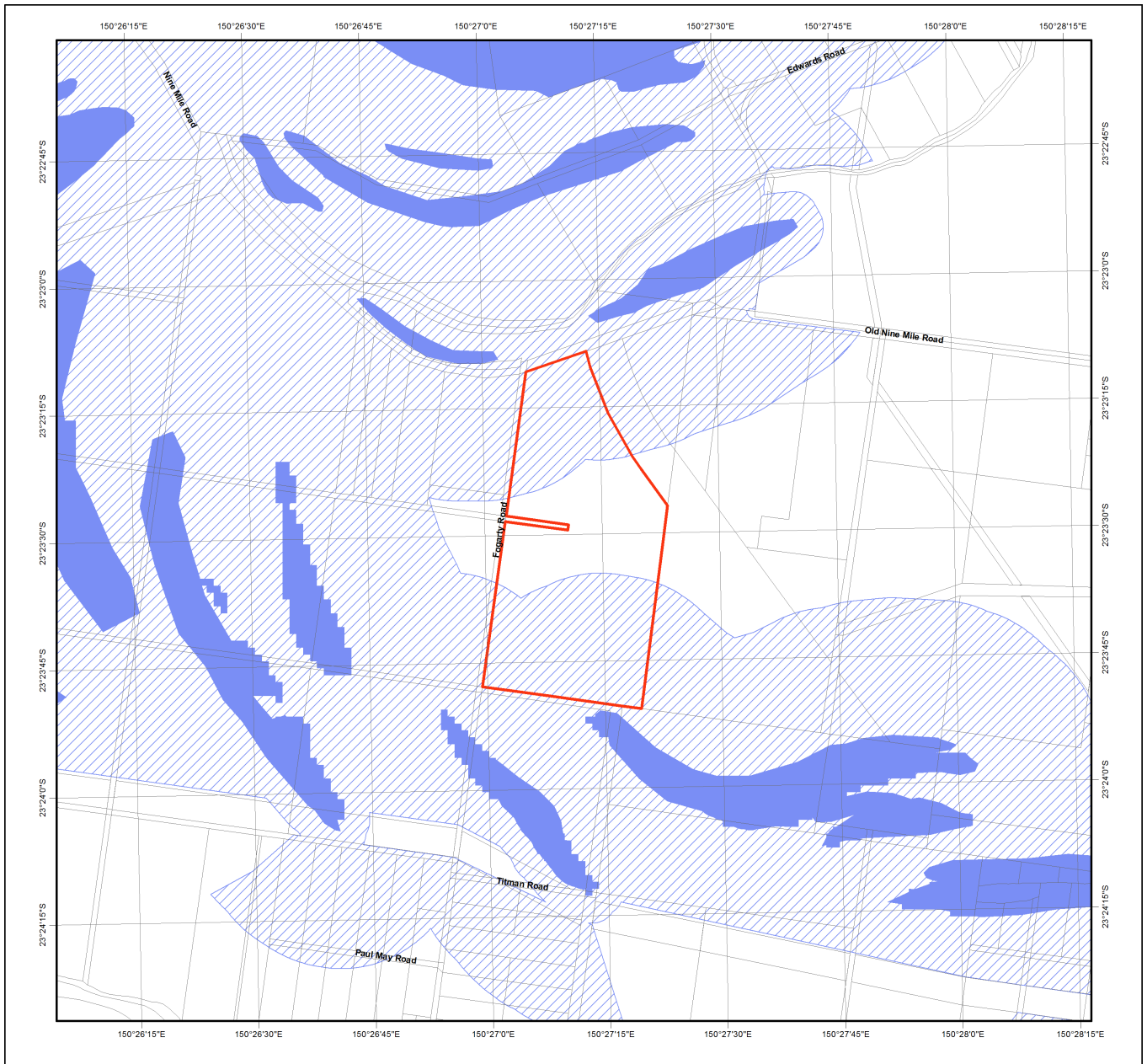


3 pm
27922 Total Observations





Calm 6%

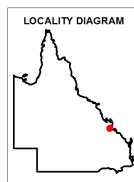


**Appendix D – Map of Referable Wetlands – Wetland Protection Areas – Lot
100 SP318665**



Map of Great Barrier Reef Wetland Protection Areas

-  Selected Lot and Plan
-  Cadastral Boundary
-  Wetland in a wetland protection area
-  Great Barrier Reef wetland protection area



This product is projected into GDA 1994 MGA Zone 56

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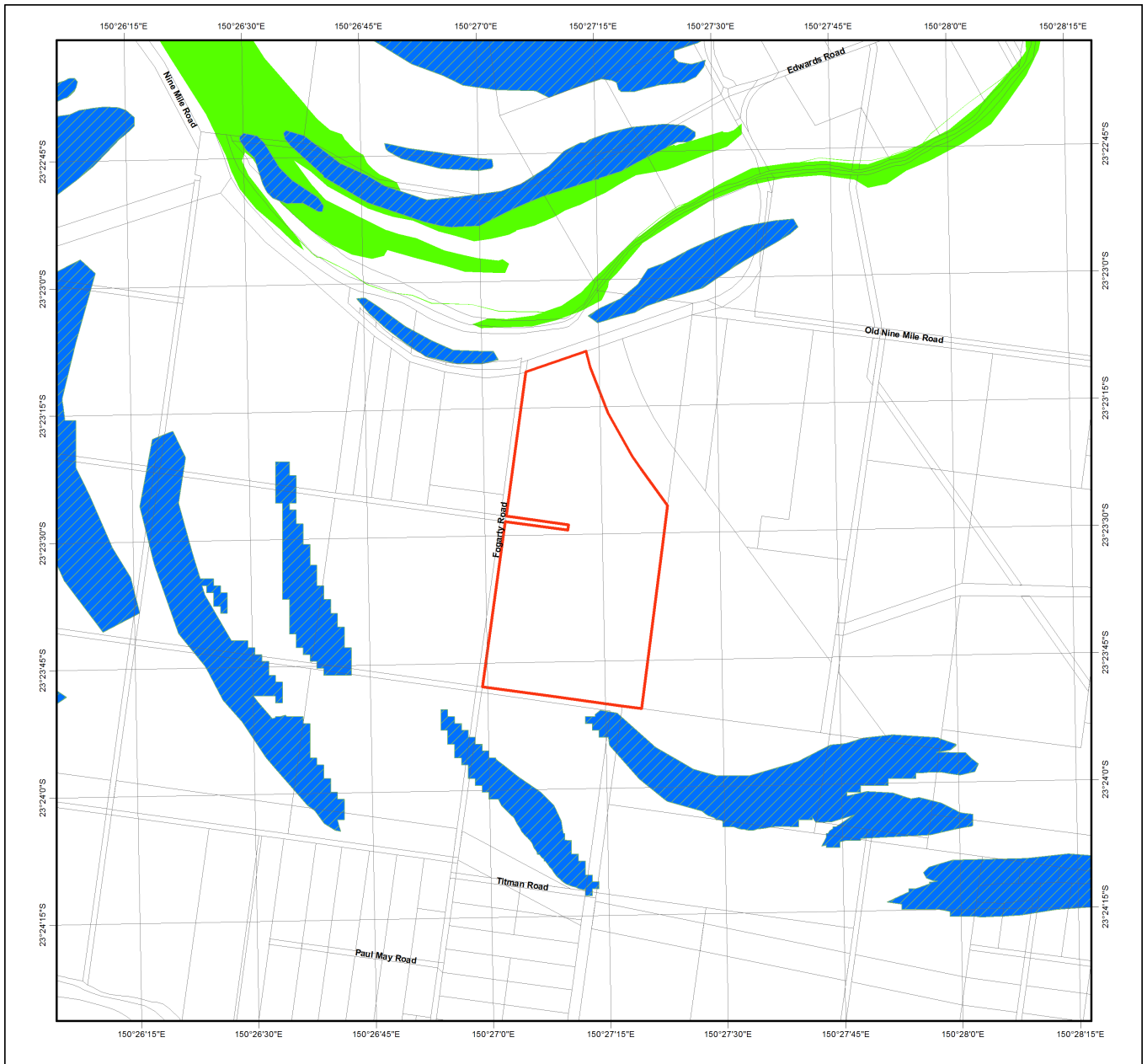
Note:
This map shows the location of wetland protection areas which are defined under the Environmental Protection Regulation 2008. Within wetland protection areas, certain types of development involving high impact earthworks are made assessable under Schedule 3 of the Sustainable Planning Regulation 2009.

The Department of State Development, Manufacturing, Infrastructure and Planning is the State Assessment Referral Agency (SARA) under Schedule 7 of the Sustainable Planning Regulation 2009 for assessable development involving high impact earthworks within wetland protection areas. The Department of Environment and Science is a technical agency.

The policy outcome and assessment criteria for assessing these applications are described in the State Development Assessment Provisions (SDAP) State Code 9 : Great Barrier Reef Wetland Protection Areas.

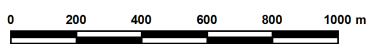
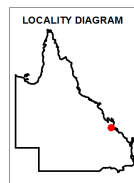
This map is produced at a scale relevant to the size of the lot on plan identified and should be printed at A4 size in portrait orientation. Consideration of the effects of mapped scale is necessary when interpreting data at a large scale.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science, email planning.support@des.qld.gov.au.



Map of Queensland Wetland Environmental Values

- Selected Lot and Plan
- Cadastral Boundary
- High ecological values waters management intent
-
- Wetlands assessed under section 7
- GBR wetland of high ecological significance
- Wetland of high ecological significance
- Wetland of general ecological significance



Note:
This map shows the location of wetlands on the Map of Queensland Wetland Environmental Values under the Environmental Protection (Wetland and Water Biodiversity) Policy 2019. The map also shows high ecological value waters management intent under Schedule 2 of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019.

Wetlands are assessed for ecological significance using the environmental values for wetlands in section 7 of the Environmental Protection (Wetland and Water Biodiversity) Policy 2019. Wetlands are considered either High Ecological Significance (HES) or of General Ecological Significance (GES) for the purposes of the environmental values.

This map is produced at a scale relevant to the size of the lot on plan identified and should be printed at A4 size in portrait orientation. Consideration of the effects of mapped scale is necessary when interpreting data at a large scale.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science, email planning.support@des.qld.gov.au.

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This product is projected into GDA 1994 MGA Zone 56

**Appendix E – Matters of State Environmental Significance Report – Lot 100
SP318665**



Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Lot: 100 Plan: SP318665

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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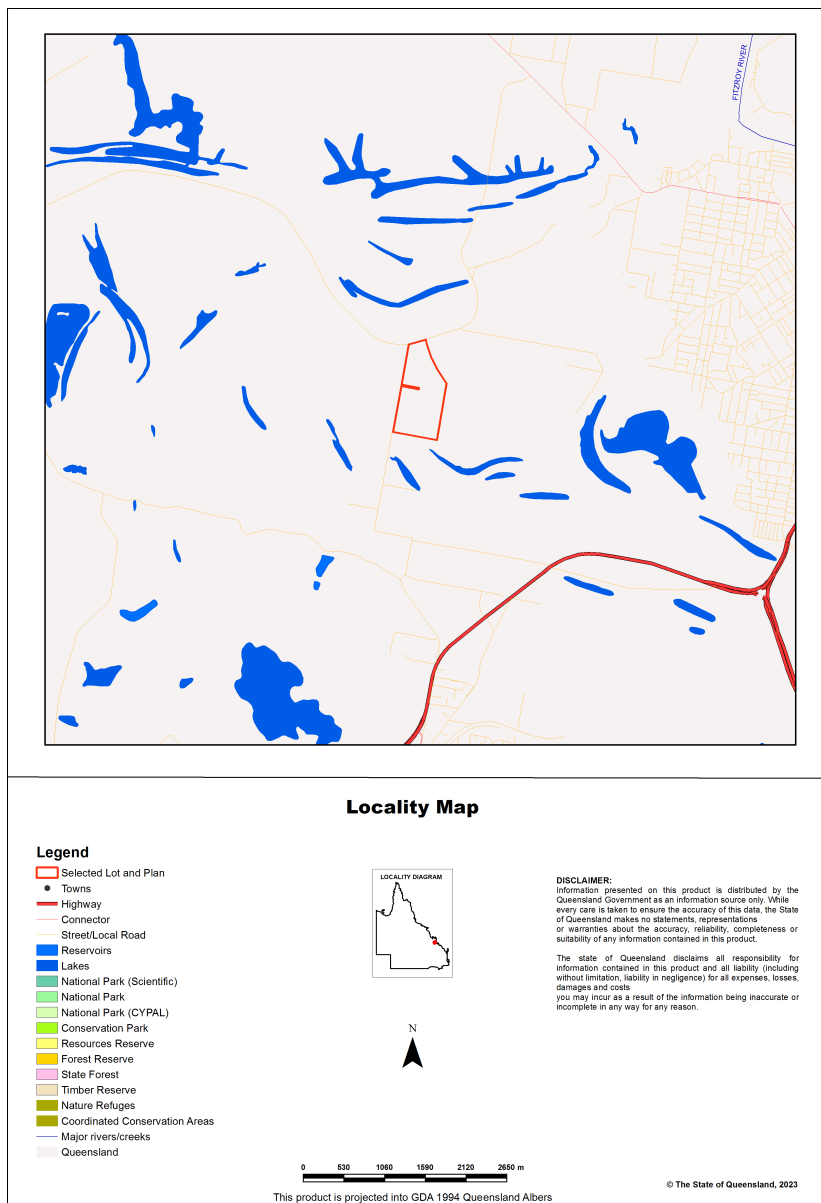
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Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI Lot: 100 Plan: SP318665

Size (ha)	60.24
Local Government(s)	Rockhampton Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Marlborough Plains
Catchment(s)	Fitzroy



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;
- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;
- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;
- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;
- Regulated vegetation under the *Vegetation Management Act 1999* that is:
 - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;
 - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;
 - Category R areas on the regulated vegetation management map;
 - Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;
 - Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;
- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;
- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;
- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;
- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0.0 ha	0.0 %
1b Protected Areas- nature refuges	0.0 ha	0.0 %
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	0.0 ha	0.0 %
6a High Ecological Value (HEV) wetlands	0.0 ha	0.0 %
6b High Ecological Value (HEV) waterways	0.0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	0.01 ha	0.01%
7b Special least concern animals	0.01 ha	0.01%
7c i Koala habitat area - core (SEQ)	0.0 ha	0.0 %
7c ii Koala habitat area - locally refined (SEQ)	0.0 ha	0.0 %
7d Sea turtle nesting areas	0.0 km	Not applicable
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	0.0 ha	0.0 %
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0.0 ha	0.0 %
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0.0 ha	0.0 %
8d Regulated Vegetation - Essential habitat	0.0 ha	0.0 %
8e Regulated Vegetation - intersecting a watercourse	0.0 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	0.0 ha	0.0 %
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(no results)

1b. Protected Areas - nature refuges

(no results)

1c. Protected Areas - special wildlife reserves

(no results)

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

(no results)

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Values are present

7b. Special least concern animals

Values are present

7c i. Koala habitat area - core (SEQ)

Not applicable

7c ii. Koala habitat area - locally refined (SEQ)

Not applicable

7d. Wildlife habitat (sea turtle nesting areas)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
<i>Boronia keysii</i>		V	None
<i>Calyptorhynchus lathami</i>	Glossy black cockatoo	V	None
<i>Casuarium casuarium johnsonii</i>	Sthn population cassowary	E	None
<i>Crinia tinnula</i>	Wallum froglet	V	None
<i>Denisonia maculata</i>	Ornamental snake	V	Core
<i>Litoria freycineti</i>	Wallum rocketfrog	V	None
<i>Litoria olongburensis</i>	Wallum sedgefrog	V	None
<i>Macadamia integrifolia</i>		V	None
<i>Macadamia ternifolia</i>		V	None
<i>Macadamia tetraphylla</i>		V	None
<i>Melaleuca irbyana</i>		E	None
<i>Petaurus gracilis</i>	Mahogany Glider	E	None
<i>Petrogale persephone</i>	Proserpine rock-wallaby	E	None
<i>Pezoporus wallicus wallicus</i>	Eastern ground parrot	V	None
<i>Phascolarctos cinereus</i>	Koala - outside SEQ*	E	None
<i>Taudactylus pleione</i>	Kroombit tinkerfrog	E	None
<i>Xeromys myoides</i>	Water Mouse	V	None

*For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.

Threatened (endangered or vulnerable) wildlife species records

(no results)

Special least concern animal species records

Scientific name	Common name	Migratory status
<i>Tringa stagnatilis</i>	marsh sandpiper	Y

Scientific name	Common name	Migratory status
<i>Tachyglossus aculeatus</i>	short-beaked echidna	

Shorebird habitat (critically endangered/angered/vulnerable)

Not applicable

Shorebird habitat (special least concern)

Not applicable

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

<https://www.qld.gov.au/environment/plants-animals/species-list/>

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals**, **Map 3b - MSES - Species - Koala habitat area (SEQ)** and **Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/>

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

<https://environment.ehp.qld.gov.au/regional-ecosystems/>

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Not applicable

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Not applicable

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Not applicable

8d. Regulated Vegetation - Essential habitat

Not applicable

8e. Regulated Vegetation - intersecting a watercourse**

(no results)

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Not applicable

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets**9a. Legally secured offset areas - offset register areas**

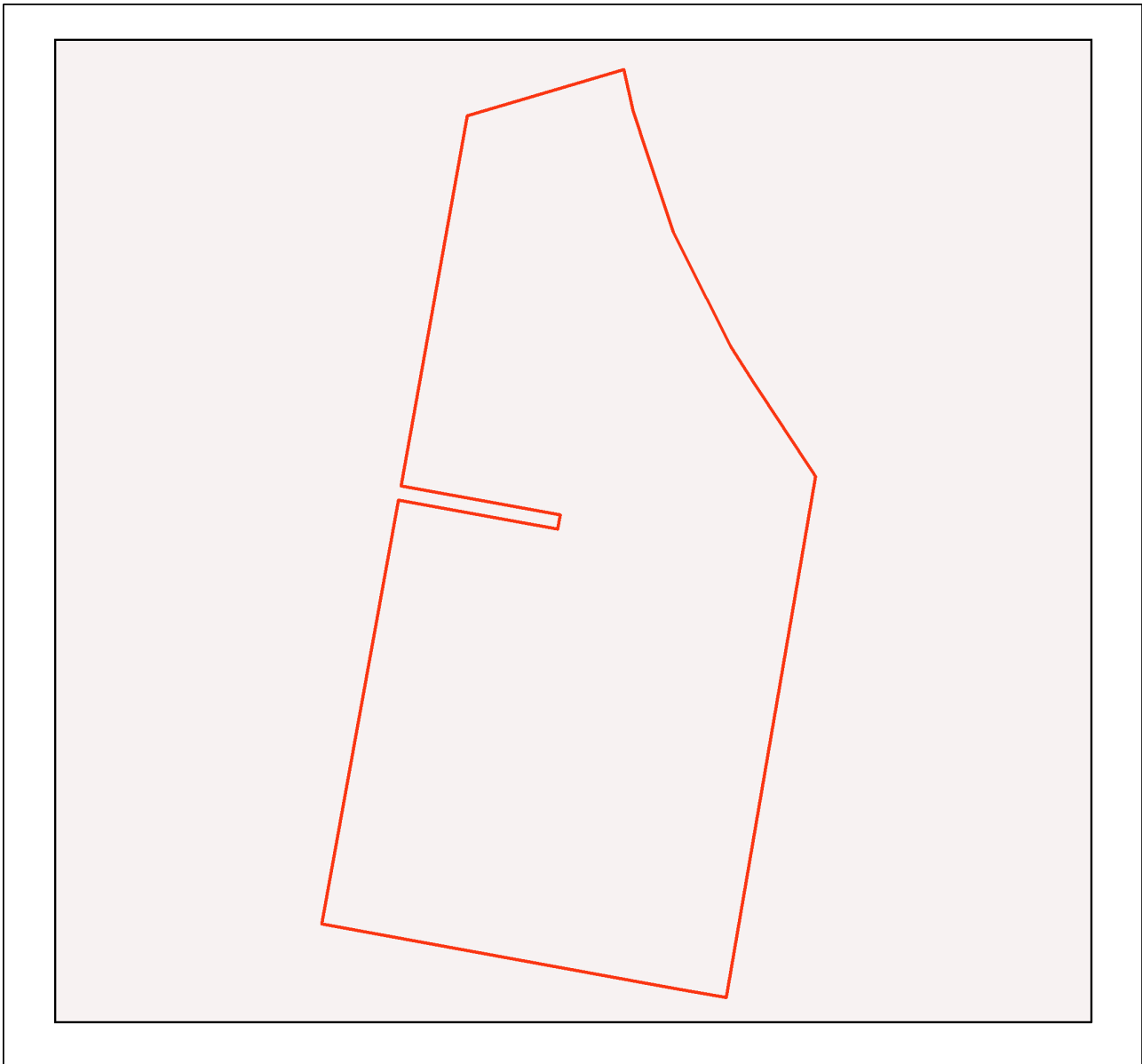
(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(no results)









Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

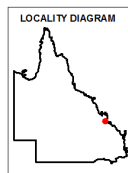
Map 1 - MSES - State Conservation Areas



MSES - State Conservation Areas

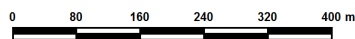
Area of Interest

-  Selected Lot and Plan
-  Towns
-  Freeways/Highways
-  Secondary roads
-  Major rivers/creeks
-  Protected area (estates, nature refuges, special wildlife reserves)
-  Declared fish habitat area (A and B areas)
-  Marine park (highly protected)



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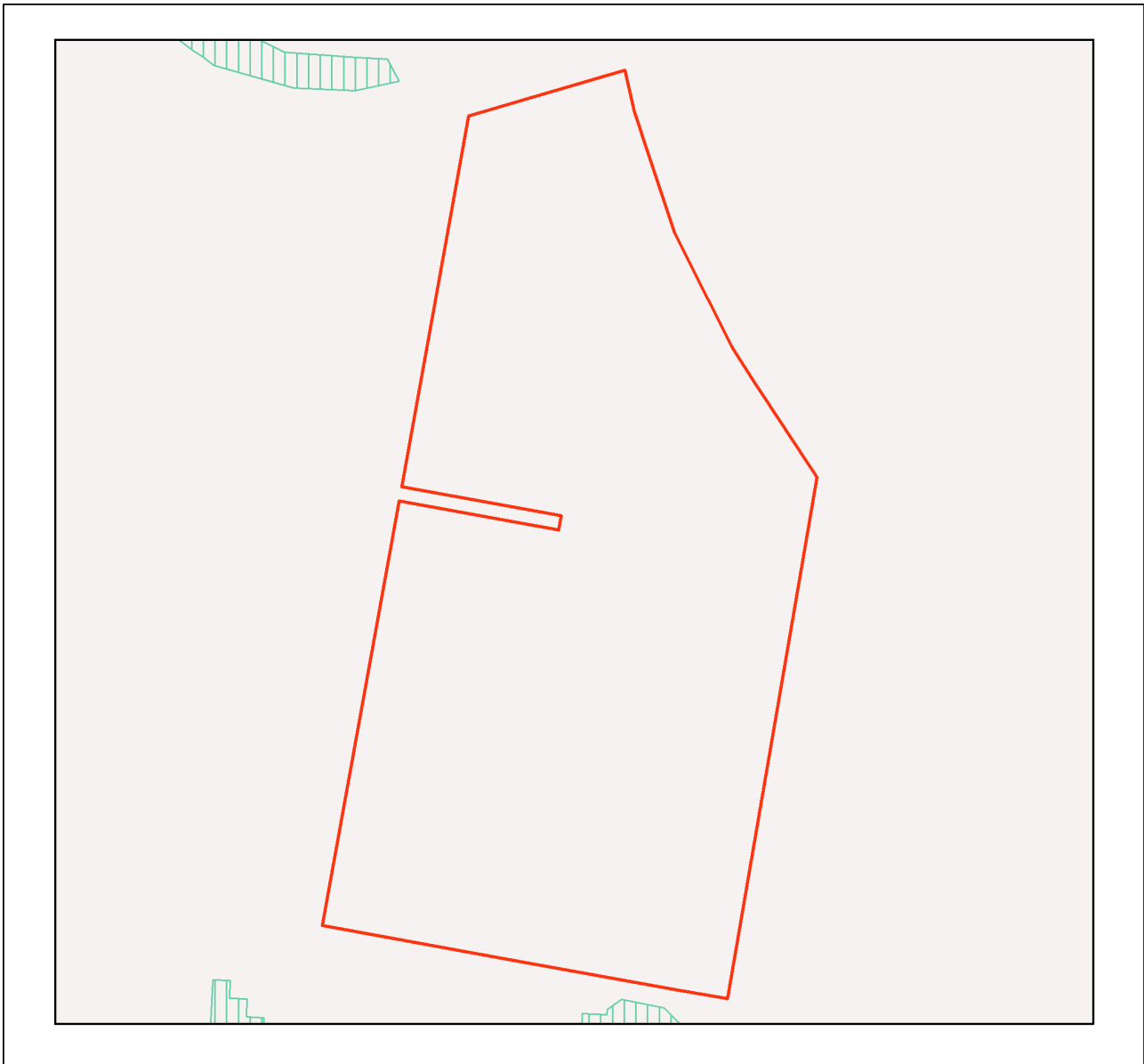
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






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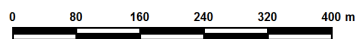
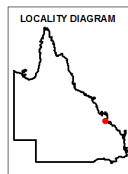
Map 2 - MSES - Wetlands and Waterways



MSES - Wetlands and Waterways

Area of Interest

-  Selected Lot and Plan
-  Towns
-  Freeways/Highways
-  Secondary roads
-  Major rivers/creeks
-  Declared high ecological value waters (watercourse)
-  Strategic environmental area (designated precinct)
-  Declared high ecological value waters (wetland)
-  High ecological significance wetlands



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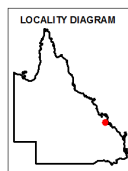
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



MSES - Species Threatened (endangered or vulnerable) wildlife and special least concern animals

Area of Interest

- Selected Lot and Plan
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)



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Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species Koala habitat area (SEQ)

Area of Interest

- Selected Lot and Plan
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping>

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.



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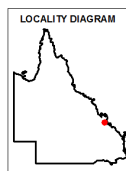
Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)



MSES - Wildlife habitat (sea turtle nesting areas)

Area of Interest

- Selected Lot and Plan
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (sea turtle nesting areas)

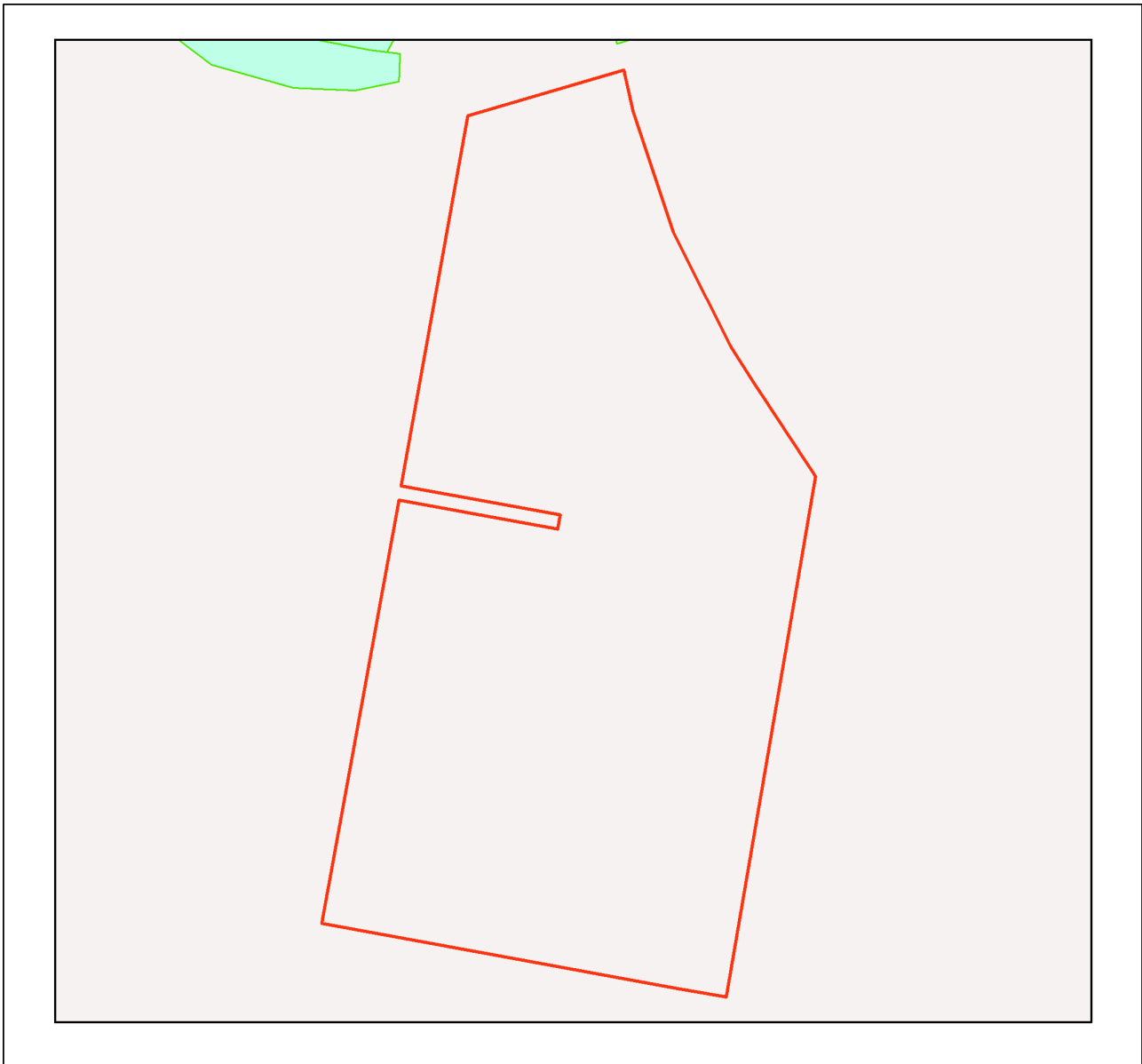


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MSES mapping of sea turtle nesting areas identifies beaches where the recorded number of turtle nests are over 1% of the turtle species or genetic stock. The linework is also deliberately extended along nearby rocky coastlines and headlands to recognise that significant numbers of nesting adults and hatchlings can become disoriented by light pollution from development on rocky coastlines and headlands while navigating offshore from nesting beaches.



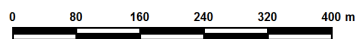
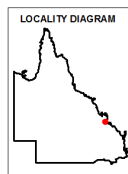
Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

Area of Interest

- Selected Lot and Plan
- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)



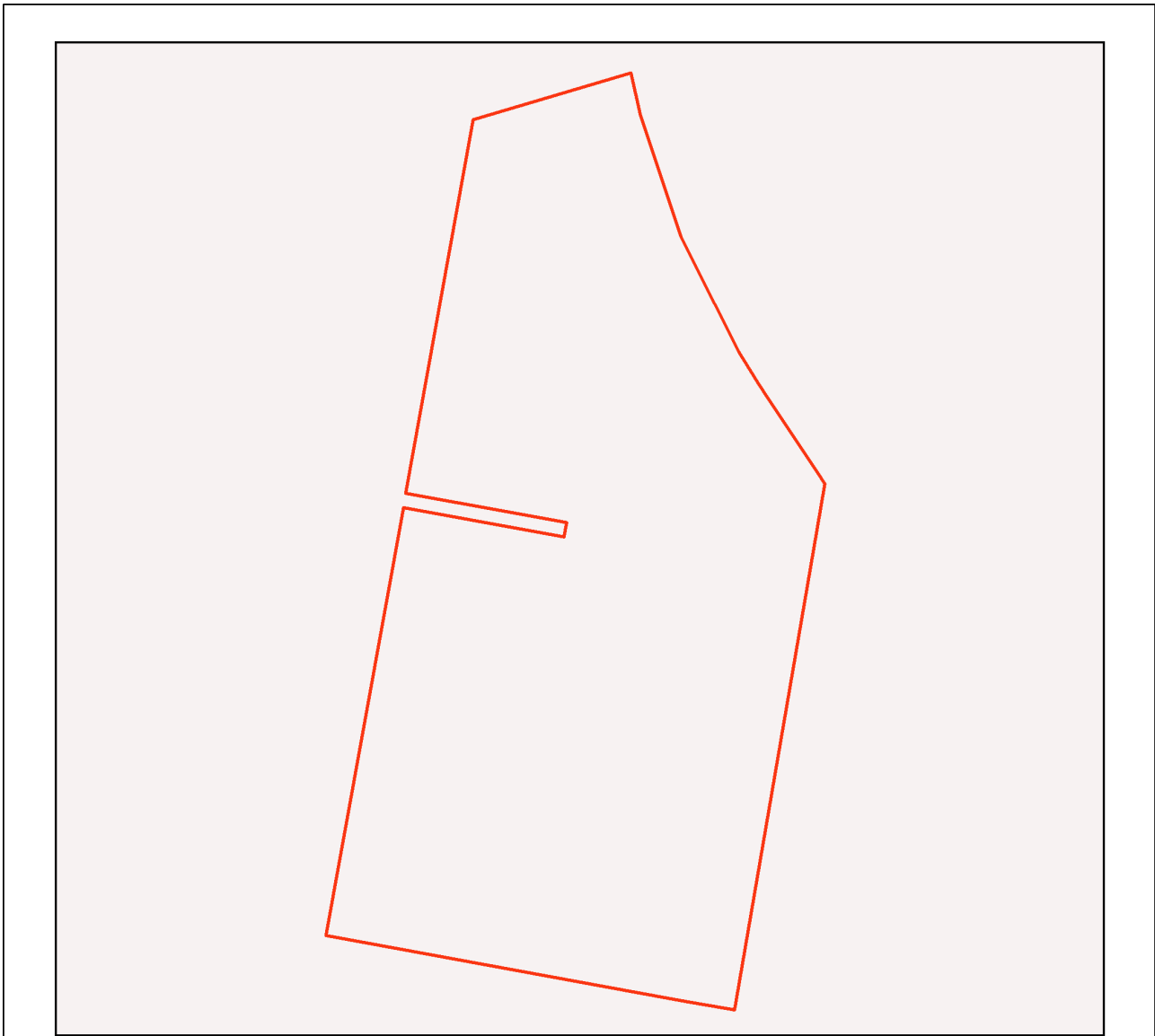
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




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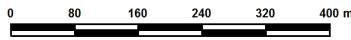
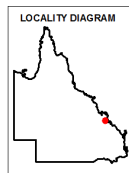
Map 5 - MSES - Offset Areas



MSES - Offsets

Area of Interest

-  Selected Lot and Plan
-  Towns
-  Freeways/Highways
-  Secondary roads
-  Major rivers/creeks
-  Legally secured offset area (offset register)
-  Legally secured offset area (vegetation offsets)



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Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

<http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html> .

Appendix 2 - Source Data

The datasets listed below are available on request from:

<http://qldspatial.information.qld.gov.au/catalogue/custom/index.page>

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	current QSpatial data (http://qspatial.information.qld.gov.au)
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	- WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019 - Sea Turtle Nesting Areas records
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- <i>Environmental Protection Act 1994</i>
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- <i>Vegetation Management Act 1999</i>