The proposed expanded Ballymore Resources Pty Ltd Dittmer Mine Project in the Whitsundays needs a new Environmental Authority to assess and quantify Potential Impacts onsite and downstream on an Area of regional Interest, MNES, MSES, Protected Areas, a Nationally Important Wetland and the GBRWHA

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2nd January 2025

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Summary

Ballymore Resources Pty Ltd proposes an extension of their Standard Environmental Authority to mine gold and the critical mineral copper in the Dittmer Mine Project, some 48 km upstream of Repulse Bay and the Great Barrier Reef. Current information available to the public strongly suggests that the Standard form of an Environmental Authority will be inappropriate because no EIS will be required and there are potential on-site and downstream risks to Matters of National and State Significance and other matters of significance that need to be assessed and quantified. This information is presented in this report. Corrections and additional information are invited to update this report so the public and the affected community can fully know the social, physical, and environmental impacts.

Mining Leases for the Dittmer mine project

The Ballymore Resources Pty Ltd. mining tenures exist in many of the Great Barrier Reef coastal catchments Fig. 1.

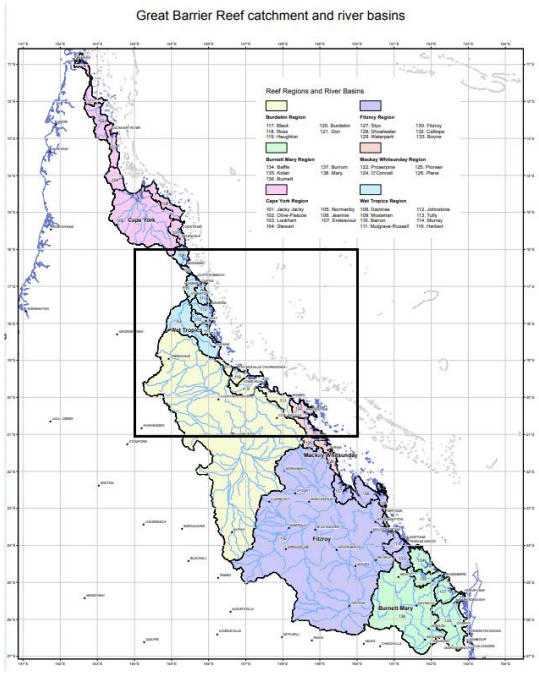

Fig. 1 Great Barrier Reef catchments and river basins. Ballymore Resources Ltd has near coastal EPMs and MLs within black outlined section.

Their Dittmer mine project is in the Whitsunday region in the Proserpine River catchment (Fig. 2).

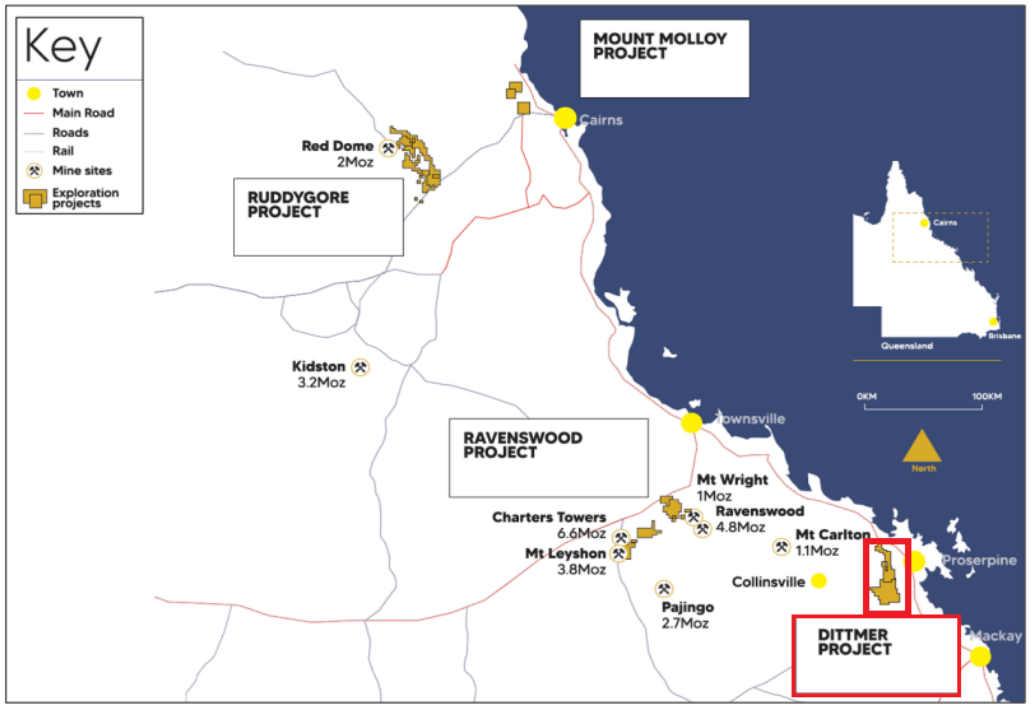

Fig. 2 Location of the Dittmer mine project in Ballymore Resources Ltd. Holdings in Queensland

There are a large number of Exploration Permits for Minerals (EPMs) in coastal Whitsunday region so it is important to evaluate their risk of adverse impacts on the GBR coast and the GBR inshore and offshore areas if they go ahead to avoid an outcome of Legacy mines permanently sending toxic pollution downstream from GBR catchment mining projects into the GBRWHA(Fig. 3(a) & (b)).

When an Environmental Authority (EA) is required by DESTI

An EA is required for environmentally relevant activities (ERAs), which include mining and other resource activities that could release contaminants into the environment

If an Environmental Authority is required of a mining proponent under the Environmental Protection Act 1994, the Department of Environment and Science (now DESTI) will need to issue an environmental authority.

If an Environmental Authority is not required, it means the mining proponent meets the Small Scale Mining Activity criteria. This criterial is defined under schedule D of the Environmental Protection Act.

Depending on a mining company project's level of environmental risk, it needs to apply for a **standard application** for an EA, **a variation application**, or **a site-specific application**.

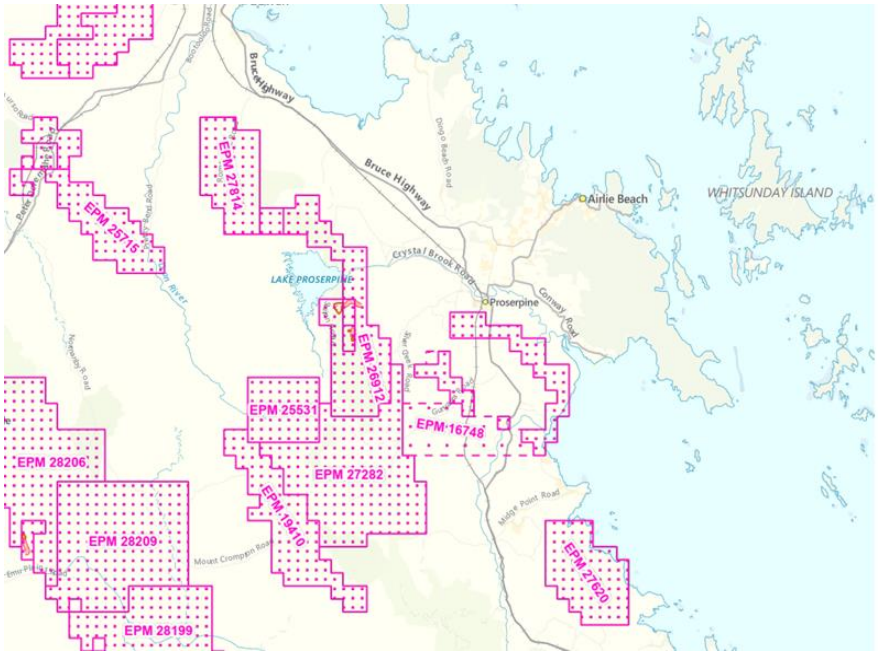

Fig. 3(a) Exploration Minerals Permits(EPMs) within the Whitsunday region

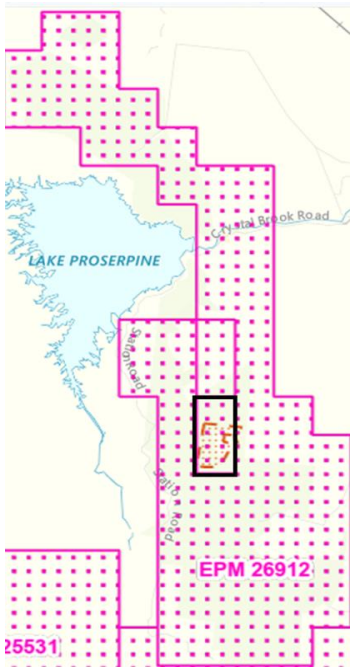

Fig. 3(b) Dittmer mine project and surrounding EPMs

The proposed Ballymore Resources Dittmer Mine extension (Dittmer mine project) is a project that has Mining Leases. It originally had a Standard Application for an EA permit EPSL00460513 issued in 2010 to mine gold and copper via underground tunnels in a total of four mining blocks. Later 21/08/2023 it applied for an MLA extension for this permit i.e. a permit to extend its original Mining Lease i.e. MLA EPSL00460513 to include 58 blocks. This was on the grounds that all mining methods, plans and procedures would stay the same and that as a result, their assessment of the project as low level risk of adverse environmental impacts would not change, even though it would mean mining in an area of 28 ha would change to mining in an area of 272 ha. This is a big risk to take because under the current EA there is no way to evaluate the real level of risk to significant environmental values. The danger is that the Dittmer mine project could become a Legacy Mine.

On its website Ballymore Resources makes the fooling statements:[1]

[1] https://www.ballymoreresources.com/site/projects/dittmer-project/q-a-s

Have you undertaken any Environmental studies to support the lease application?

We take our responsibility to the environment surrounding the mine site very seriously and we are committed to having minimal environmental impact in the area,

We have complied with all state legislation throughout the application process. and as such, a significant residual impact assessment was completed by an independent third party. This assessment has been submitted to the Department of Environment, Science, and Innovation as part of our MLA process. We have also conducted several hydrogeological and surface water studies and submitted as part of the lease application. These studies form the basis of our environment management plan which includes ongoing monitoring and assessment of environmental values of the site.

An assessment under the Environment Protection and Biodiversity Conservation (EPBC) Act has also been completed as part of the larger mining lease application in consultation with the Federal Environmental Department.

AND

Have you undertaken studies that look at the high rainfall levels in the area? And how your activities at the mine could impact water supplies at peak times?

We have completed a groundwater and surface water management plan. An independent and compliant third-party provider completed this work, and the plan addresses the management of surface and groundwater on-site.

We have already installed several measures to improve the historic management of water on site and provide a better outcome for the surrounding waterways.

Given the level of risk of on-site and downstream adverse environmental impacts has not been evaluated or demonstrated, and there are significant environmental values that exist, the Precautionary Principle should apply:

The precautionary principle allows for protective measures to be taken when there is uncertainty about the risk of environmental harm, without having to wait until the harm occurs.

AND

What impact will your mining developments have on local flora, fauna, and habitats of endangered species that call Dittmer home?

We take our responsibilities to the local environment and protected habitat surrounding the mine site seriously. We are committed to doing what we can to limit our environmental impact, this includes removing leftover material from the projects's previous operations, using already established tracks, and minimising our surface footprint through underground operations.

We have undertaken a significant residual impact and EPBC assessment relating to our proposed mining footprint. That assessment confirmed that there will be no residual impact on local flora, fauna, and habitats.

All assessments have been provided to the relevant administering authority at both state and federal levels.

The mining operations outlined in our MLA are primarily underground with minimal disturbance to surface areas.

A **Right to Information Request** was sent to DESTI to request copies of the studies done and a reply received on the 28th November 2024.

- **Significant residual impact assessment. This was completed by an independent third party and submitted to DESTI as part of the Mining Lease Application (MLA) Process.** A copy is yet to be provided to the RTI applicant. DESTI is pursuing that.
- **Several hydrogeological and surface water studies.** DESTI has told the RTI Officer that they do not have such copies so cannot provide them.
- Ballymore states that they have completed a **groundwater and surface water management plan**. An independent and compliant third-party provider completed this work, and the plan addresses the management of surface and groundwater on-site. They state they have already installed several measures to improve the historic management of water on site. None of these plans are posted on their website as of 2/12/2024.

The RTI officer explained that DESTI does not have baseline groundwater data but the department of Regional Development, Manufacturing and Water do have access to historical bore data and may be able to provide any data that may exist for this area.

- **Environmental Management Plan.** Not a part of the RTI request and not available online to date (2/12/2024).
- **Assessment of Matters of National Environmental Significance (MNES) under the Australian EPBC Act**. If this was done as part of an EPBC Referral, then it is not listed in a search of the Referral website as of 2/12/2024. There are MNES within the mine site and many matters of national significance downstream of the mine site as far as the GBRWHA. We could check with the department to see if they can confirm contact with Ballymore Resources and just what was assessed. In our report we identify known existing downstream EPBC matters. It may be that a formal EPBC Referral is not required until Ballymore Resources announces that its exploration is far enough along to begin mining extraction or processing operations.

Ballymore Resources states on its website:

> Currently, our work at the site involves exploration activities only, and we are not undertaking any form of extraction or processing.
>
> If extraction does take place in the future, we will use the available, best-practice extraction methods and work with the local community and government organisations to ensure we meet all our environmental and legislative obligations.
>
> Environmental monitoring is a condition of our Environmental Authority (EA) and forms an integral part of assessing any impact on the surrounding environment.
>
> We have undertaken a significant residual impact and EPBC assessment relating to our proposed mining footprint. That assessment confirmed that there will be no residual impact on local flora, fauna, and habitats.
>
> All assessments have been provided to the relevant administering authority at both state and federal levels.

EPBC Referrals has been contacted by email on 2/12/2024 to request details on any EPBC assessment requirements that Ballymore Resources had with them on MNES related to the project and whether they advised the company that there were no MNES and therefore no need for an EPBC Referral, Also if needed when would a formal EPBC Referral be needed. Ether during the exploration stage or just before the beginning of the mining and processing operations.

In this case DESTI has not required a hydrology report or an EIS.[2] It needs to require a **site-specific EA application** so that an EIS would be done, and the level of risk could be more accurately and robustly determined from the information provided via a thorough and professional EIS assessment. DESTI could then demonstrate that it had applied the Precautionary Principle by following best practice, rather than risking a Legacy Mine where a mining company lacks the financial means to remedy adverse impacts, and the burden falls on the State.

An extension of the original EA permit means Ballymore Resources can avoid having to apply for a **site-specific EA application.** That would require more rigorous background reports and an Environmental Impact Assessment because of the potential for a higher level of risk of adverse environmental impacts in a larger scale of operation where downstream impacts on matters of environmental and agricultural significance could occur.

Ballymore Resources Ltd. has also not submitted an EPBC Referral for possible significant impacts on Matters of National Environmental Significance (MNES) within and downstream of its Mining Leases MLs Fig. 4(a) & (b) and Figs. 5(a) & (b). Under an EIS assessment it would be required to refer such matters to Australia's DCCEEW.

[2] As advised via a RTI request.

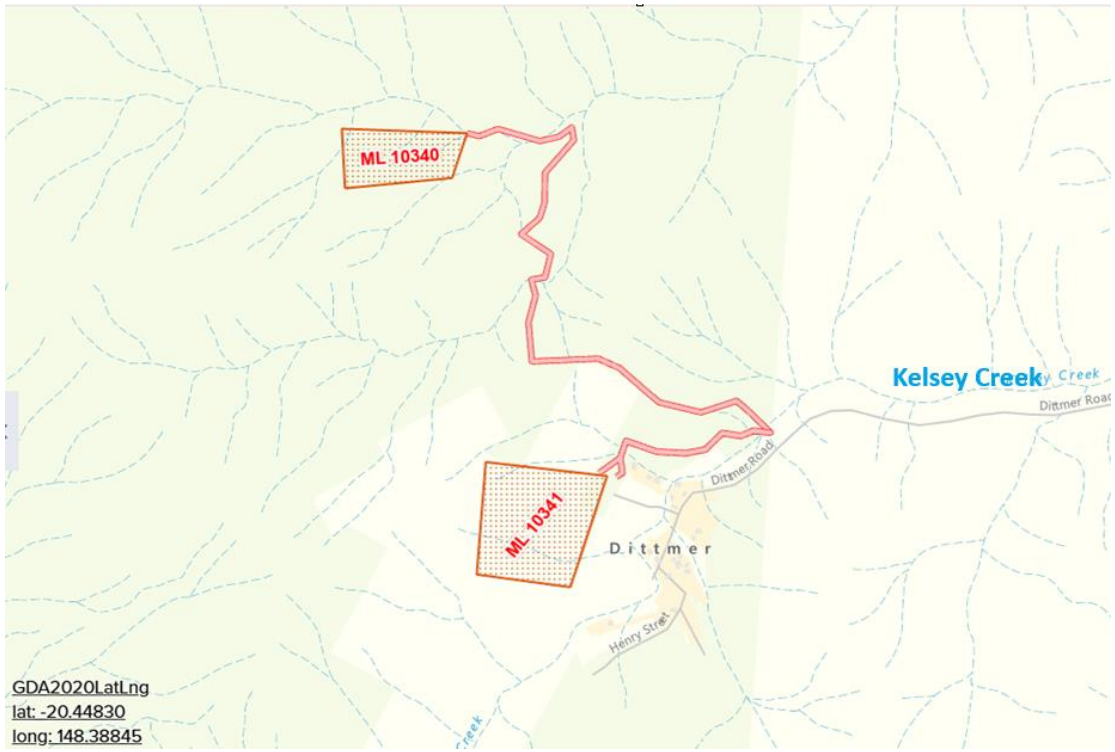

Fig. 4(a) Dittmer mine project Mining Leases (MLs)

Fig. 4(b) Dittmer MLs and expiration dates

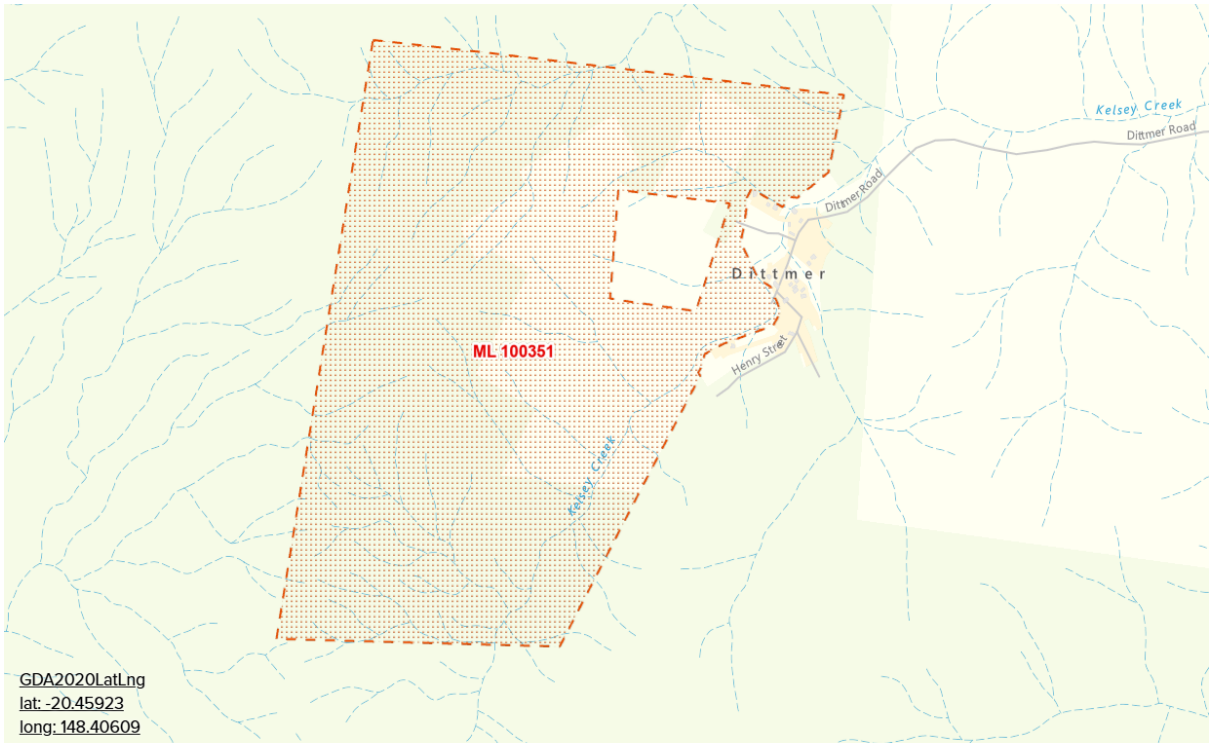

Fig. 5(a) Location of a Mining Lease Permit and Surface Area Application ML 100351

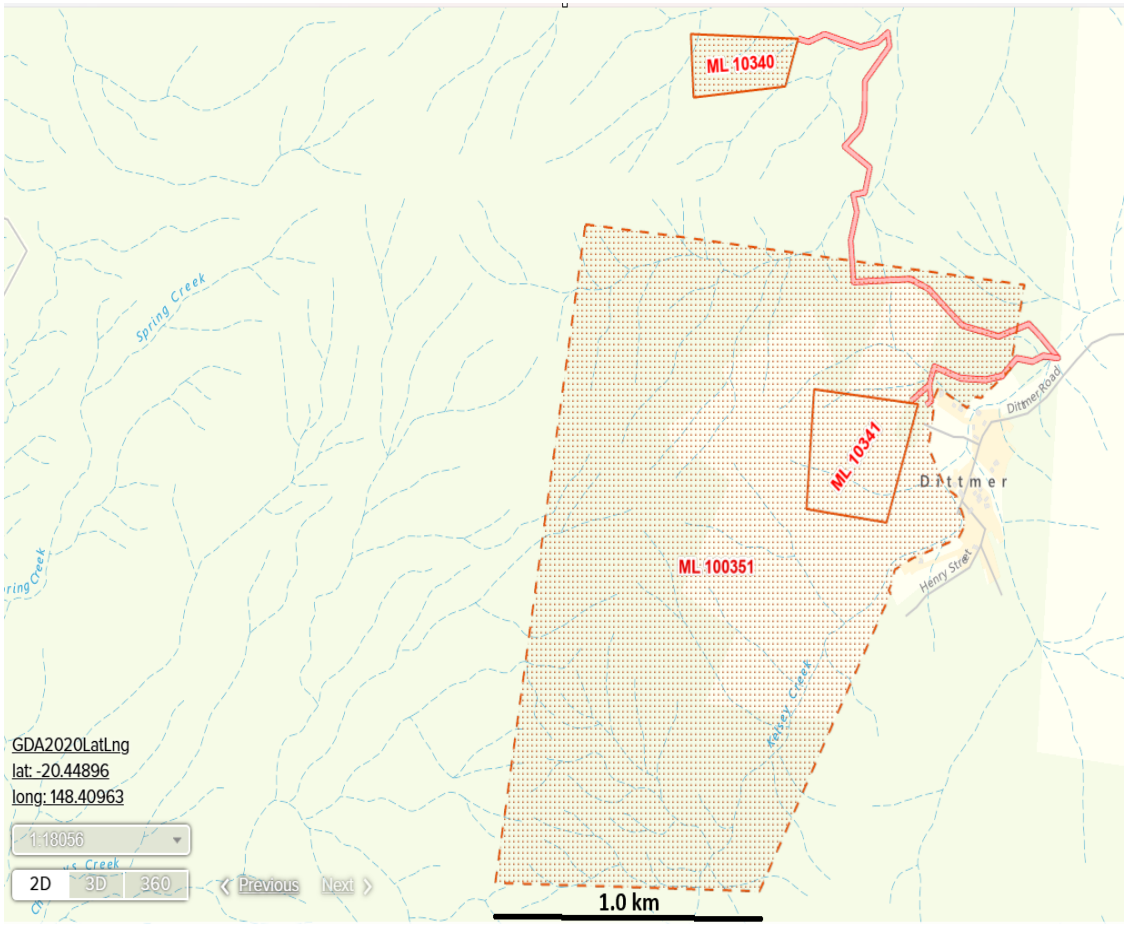

Fig. 5(b) Location of the Dittmer Mining Leases ML 100340, ML 10341 & the Mining Lease Permit and Surface Area Application ML 100351.

The proposed tunnels spreading out from the original mine site will be under Surface Area Application ML 100351 (Fig. 6) and Lot and Plan map of the original Dittmer mine site (Fig. 7).

The tunnels will be underground, but there are likely to be more impacts on surface and groundwater hydrology and threatened species habitats, especially if subsidence or additional faulting occurs. The risks of increased adverse downstream impact on Matters of National and State Significance and other environmental and agricultural values are also likely to increase.

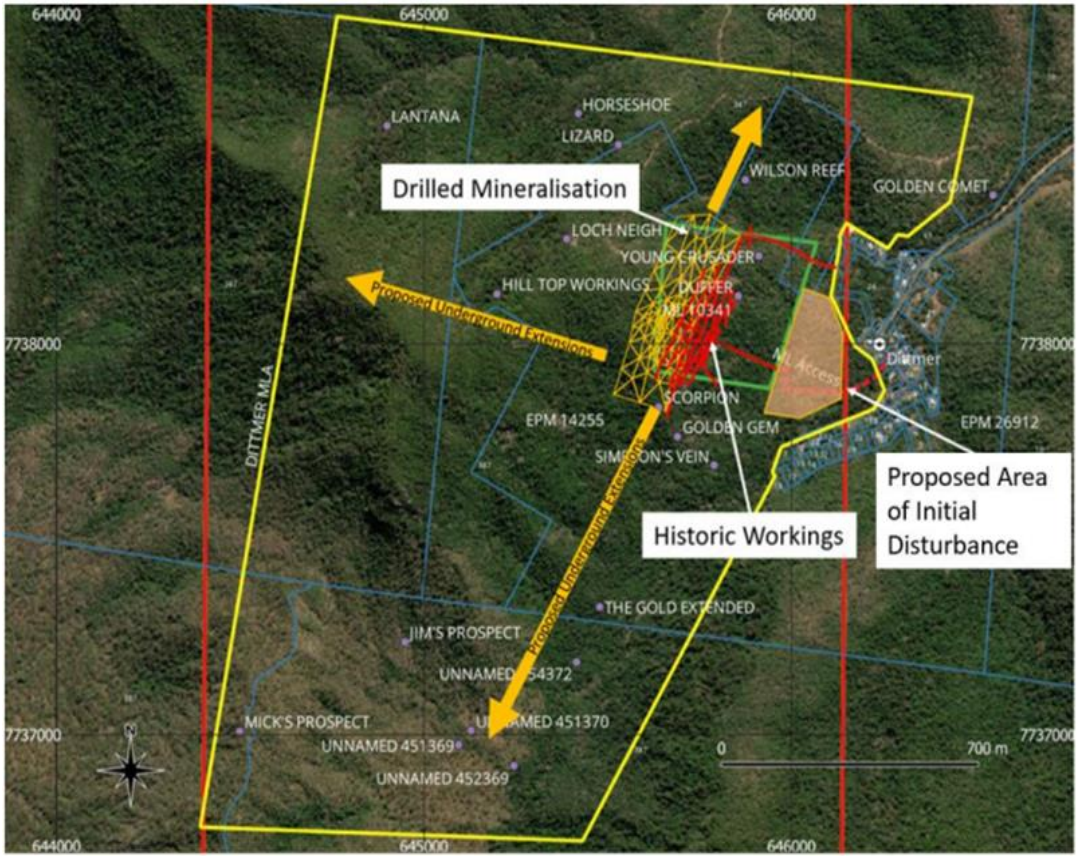

Fig. 6 Proposed location of the mine extension tunnels from the original mine.

The Dittmer community realize this and argue that the MLA should be changed to a Site-Specific EA Application so that the level of risks could be more accurately assessed and addressed to avoid the risk that the Dittmer mine project could become a Legacy Mine Project with ongoing permanent surface and groundwater pollution all the way downstream to the Great Barrier Reef World Heritage Area (GBRWHA).

This report reviews publicly available relevant legislation, policy and plan documents etc. and the current MLA100351 and EA permit EPSL00460513 to identify matters of environmental significance on site and downstream that need be addressed so ensure the long-term sustainability of this project.

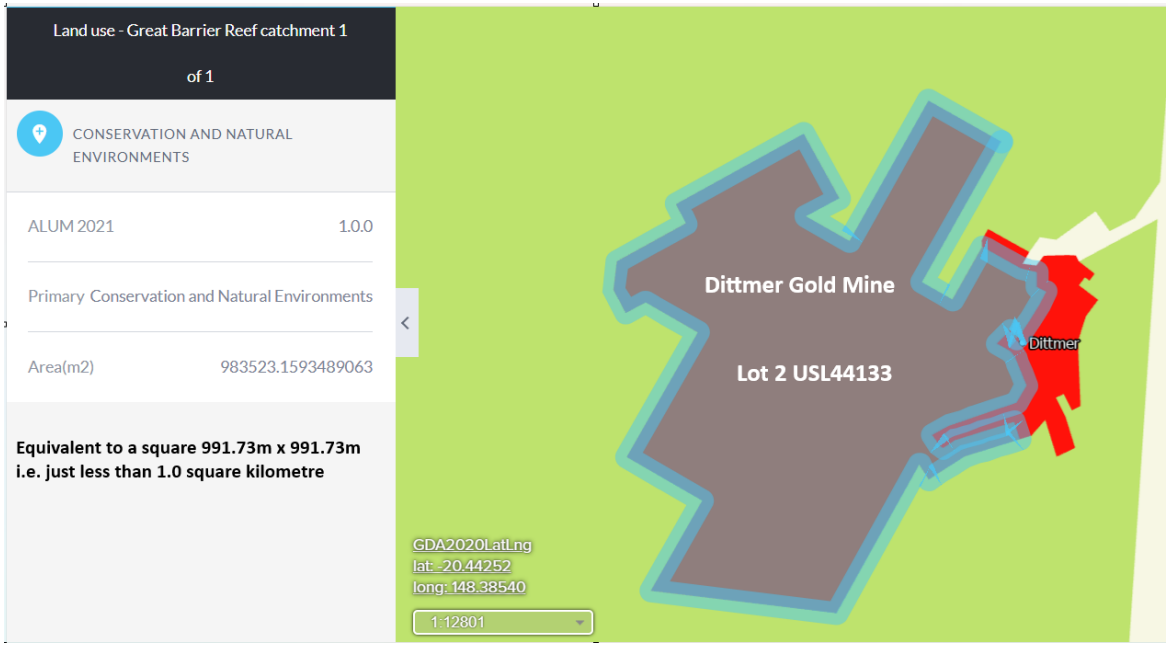

Fig. 7 Lot and Plan for the original historic Dittmer mine (Taupe) with Dittmer township (red).

Dittmer Mining Tenures and Permit for an Environmental Authority

DESI granted Environmental Authority permit EPSL 00460513 to Ballymore Resources Pty. Ltd. in 2010. This EA was for the exploration of the gold and copper Dittmer mine project in the Proserpine River Basin in The Whitsundays, This original permit was for two sites of two blocks each, which amounted to four blocks. So, they qualified as a small low impact mining exploration operation needing only a standard EA application**.**

Subsequently on 21/08/2023 Ballymore Resources applied for a variation application of EPSL 00460513 for an EA covering MLA100351. This MLA includes the original four blocks within a much larger 58 blocks. That area is way beyond the threshold of four blocks for a small scale mining operation.

A variation application for an EA also applies when an applicant can meet the eligibility criteria but needs to change one or more of the standard conditions for an Environmentally relevant Activity (ERA).

From a review in this report of the eligibility criteria, and Ballymore's plan for underground mining in multiple tunnels in that MLA100351 of 58 blocks, it seems that their current variation permit application does not apply to their expanded project. Rather a site-specific application appears most appropriate.

> **Site-specific applications**—when an applicant
> - does not meet the eligibility criteria for the ERA,
> - where there are no eligibility criteria in existence

Ballymore Resources should be applying for a new Environmental Authority not an extension of the original one.

This report covers the eligibility criteria and potential on-site and downstream impacts that might occur from the Dittmer mine project and why a site-specific application for an Environmental Authority (EA) is more appropriate.

> **Standard, variation and site-specific applications**
>
> Applications for an environmental authority for a mining or petroleum activity are divided into three different types:
>
> - **standard applications**—when an applicant can meet the eligibility criteria and all the standard conditions associated with an ERA. This application type is generally restricted to low-risk activities and are not publicly notified except for applications involving a mining lease (s 149 Environmental Protection Act)
> - **variation applications**—when an applicant can meet the eligibility criteria but needs to change one or more of the standard conditions for an ERA
> - **site-specific applications**—when an applicant
>   - does not meet the eligibility criteria for the ERA,
>   - where there are no eligibility criteria in existence or
>   - the activity is part of a coordinated project being assessed by the Coordinator-General.
>
>   These applications are subject to a whole-of-project assessment and include public notification. Standard conditions may be used in these approvals, however, it is likely that site-specific conditions will also be imposed.

ENVIRONMENTAL PROTECTION ACT 1994 - SECT 149

When notification stage applies

149 When notification stage applies

Subject to *section 150* , the notification stage applies to an application if—

(a) any part of the application is for a mining activity relating to a mining lease.

SECTION 150 NOTIFICATION STAGE DOES NOT APPLY TO PARTICULAR APPLICATIONS

(c) for an application for an environmental authority, since the EIS mentioned in *paragraph (a)* or *(b)* was notified

(i) the environmental risks of the relevant activity and the way it will be carried out have not changed; or

(ii) if the application proposes a change to the way the relevant activity will be carried out, the administering authority is satisfied the **change would not be likely to attract a submission objecting** to the thing the subject of the change, if the notification stage were to apply to the change;

Comment: Standard Application: So, there was a need for public notification of the initial ML10340 and ML10341.

Standard Variation for the MLA100351:

- when an applicant **can meet the eligibility criteria** but needs to change one or more of the standard conditions for an ERA

https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf

Comment: The following is a review of the Eligibility Criteria for a Mining Lease application and as far as we were able to address each criteria for the Dittmer mine project for MLA100351.

Eligibility criteria and standard conditions for mining lease activities—Version 2[3]

Eligibility criteria Eligibility criteria are constraints set **to ensure environmental risks associated with the operation of the environmentally relevant activity (ERA) are able to be managed by the standard conditions**. Eligibility criteria set out the circumstances in which **a standard or variation application for an environmental authority can be made.**

Eligibility criteria

a) the mining activity does not, or will not, at any one time, cause more than 10ha of land to be significantly disturbed.

Comment: Does Ballymore Resources declare anywhere how much area at a time will be mined, and if so, this is likely to be only the surface access areas to the underground tunnels, not the multiple number of underground tunnels which are at risk of affecting the surface via slumping an/or cracking such as faulting.

b) the mining activity is not, or will not be, carried out in a category A environmentally sensitive area or a category B environmentally sensitive area;

Comment: QGLOBE shows that the MLA100351 is not in a category A or B environmentally sensitive area. But habitat for the Mahogany Glider is within Category C.(Fig. 8) This species is usually found in the Wet Tropics. They may mean the endangered greater glider which is known to this area. Proserpine State Forest is within the Others category . The endangered Proserpine Rock Wallaby is known to be present here and the habitat is ideal for this species.

[3] https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf

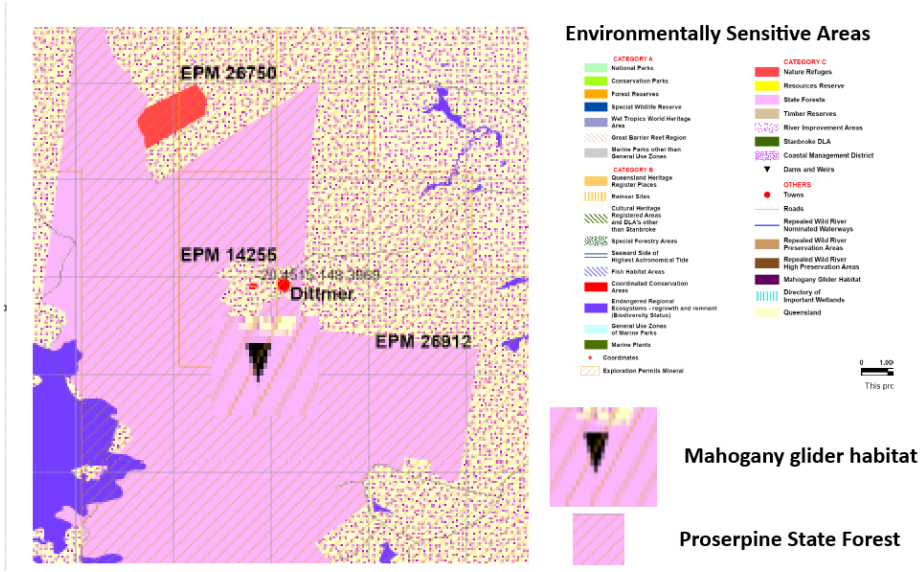

Fig. 8 Environmentally Sensitive Areas

The National Recovery Plan for the Proserpine rock wallaby[4] lists the Clarke ranges through to the Proserpine ranges- fragmented colony as most viable, largest and most at risk to extinction due to habitat loss and vulnerability due to fragmentation. Underground mining would avoid most surface clearing but there is still the risk of subsidence and more faulting destroying surface habitat for this species and changing surface hydrology, recharge and groundwater and ephemeral stream flows. A copy of the hydrogeology report has not been provided to the community to see if such risks from tunnelling have been evaluated.

Colonies are interlinked genetically and are dependent on the animals living in critical refuge sites, to replenish populations following declines due to drought, predation, disease or localised disaster.

[4] https://www.dcceew.gov.au/sites/default/files/documents/petrogale-persephone-recovery-plan.pdf

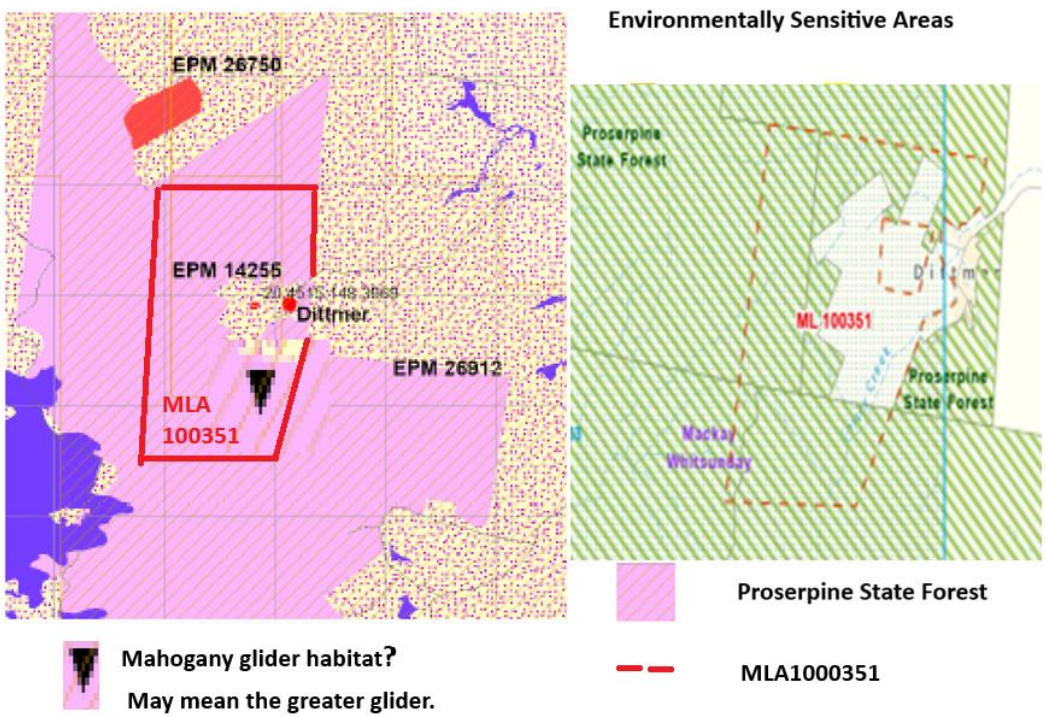

Fig. 9 Approximate location of Ballymore Resources MLA 100351 in an Environmentally Sensitive area Proserpine State Forest. ML not yet approved.

A Wildnet search of Lot 2 USL 144133 in 2005 near the township of Dittmer included one near threatened species the short-necked echidna (Figs. 10(a) & (b) & Table 1). But recently Dittmer locals said that the threatened Proserpine rock wallaby (E – EPBC; E- NCA), and northern quoll (E-EPBC) were often seen in this area where there are many Kelsey Creek tributaries.

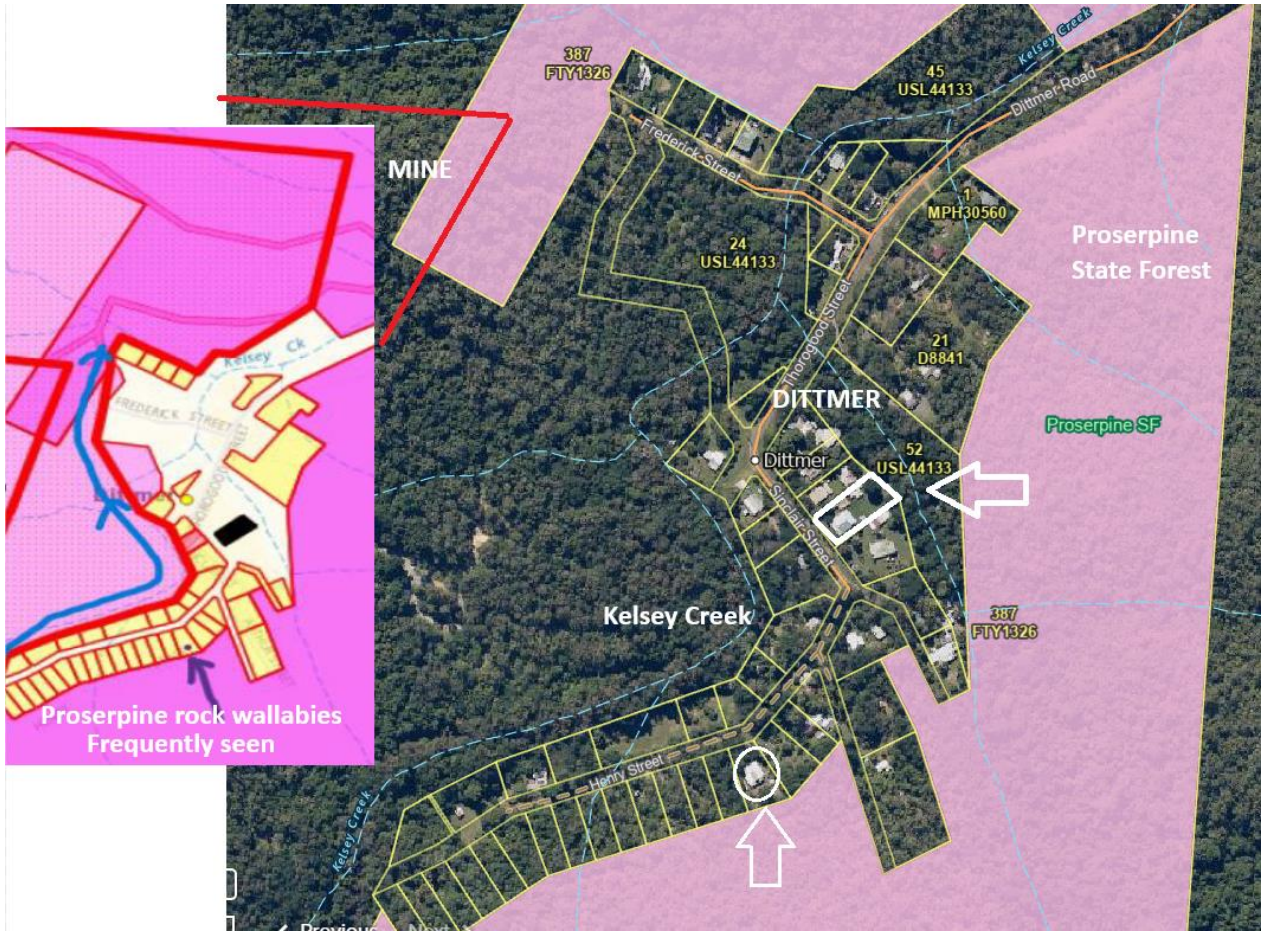

Fig. 10(a) Dittmer township frequent community sightings pf the PRW

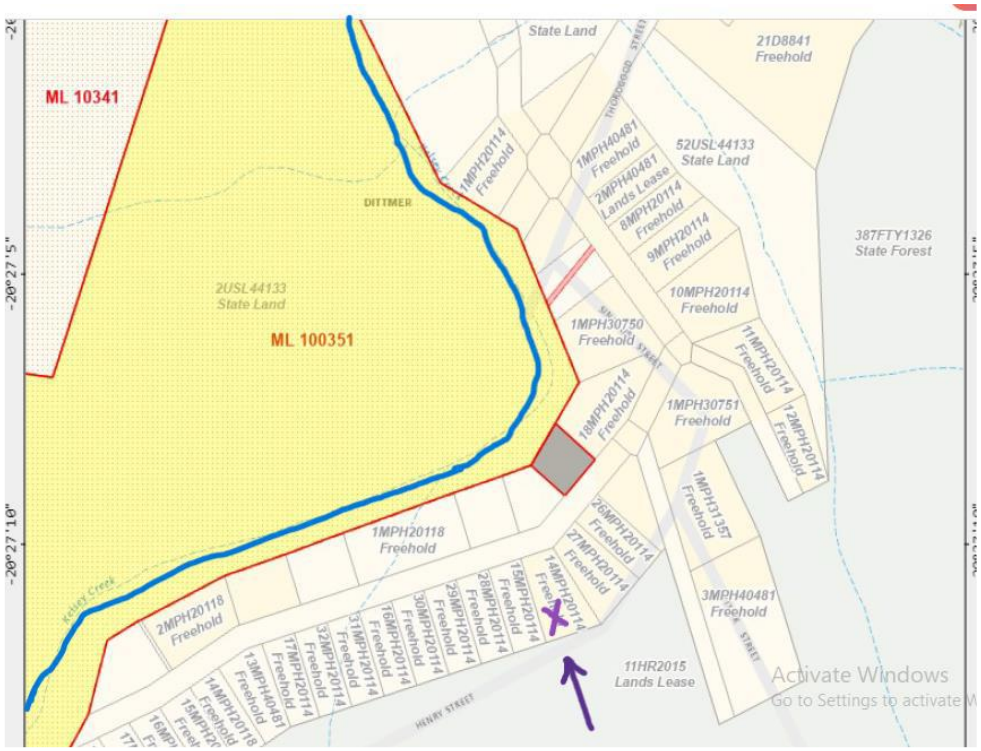

Fig. 10(b) Location of MLA 100351 in relation to Kelsey Creek and Dittmer township.

Locals note that Ballymore's ML contains Kelsey Creek and that the historic lease never included the creek. Ballymore has stated that it is not mining the creek so this map should be checked to clarify the situation. Also, the map shows ML 100351 and to date the application has not been approved. It should read MLA 100351. The distance from the property marked X to the boundary of MLA 100351 is ~100 metres.

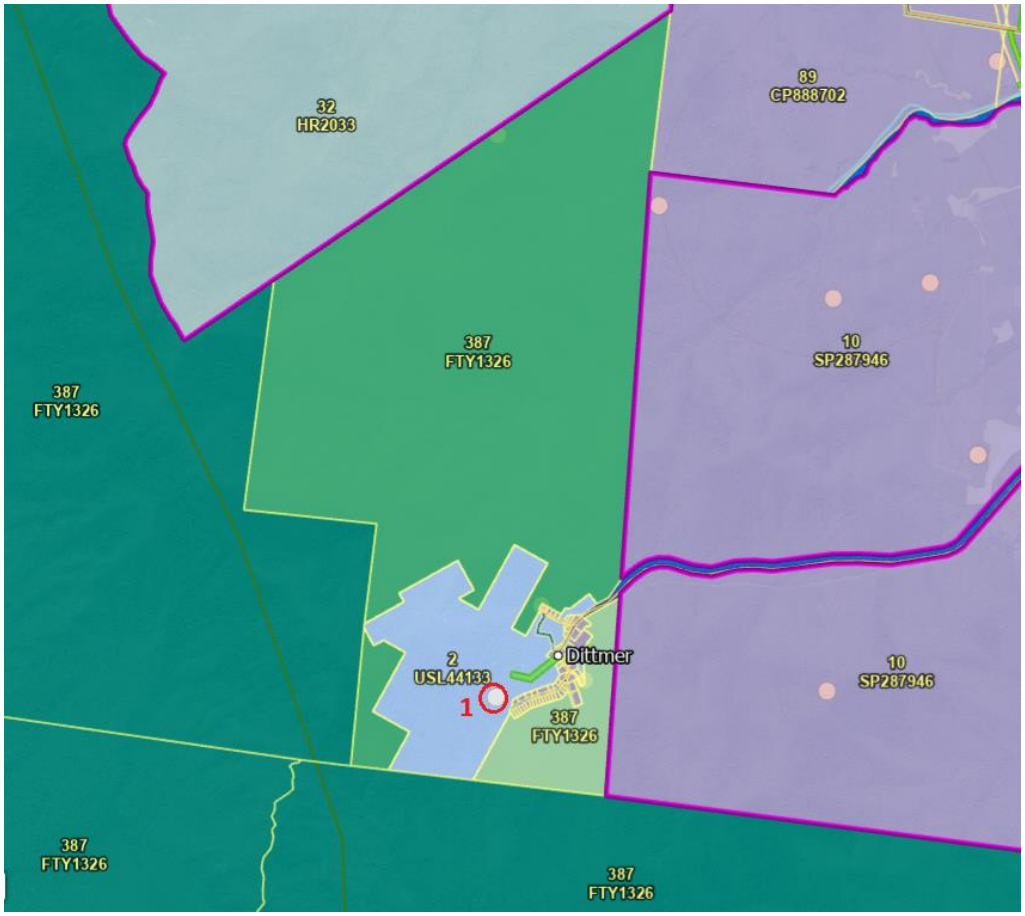

Fig. 10(c) Number 1 marks the location of Wildnet fauna list for Lot 2 USL144133 8th Dec 2005 Next to Dittmer – Proserpine State Forest

Class	Family	Scientific name	Common name	NCA	Start date	Locality
Mammalia	Miniopteridae	Miniopterus australis	little bent-wing bat	C	8-Dec-05	Dittmer - Proserpine State Forest
Mammalia	Molossidae	Mormopterus lumsdenae	northern free-tailed bat	C	1-Jun-82	Dittmer, W of Proserpine
Mammalia	Rhinolophidae	Rhinolophus megaphyllus	eastern horseshoe-bat	C	1-Jun-82	Dittmer, W of Proserpine
Mammalia	Hipposideridae	Hipposideros ater aruensis	eastern dusky leaf-nosed bat	C	8-Dec-05	Dittmer - Proserpine State Forest
Mammalia	Tachyglossidae	Tachyglossus aculeatus	short-beaked echidna	SL	8-Dec-05	Dittmer - Proserpine State Forest
Aves	Pittidae	Pitta versicolor	noisy pitta	C	8-Dec-05	Dittmer - Proserpine State Forest
Aves	Cuculidae	Centropus phasianinus	pheasant coucal	C	8-Dec-05	Dittmer - Proserpine State Forest
Amphibia	Limnodynastidae	Limnodynastes peronii	striped marshfrog	C	8-Dec-05	Dittmer - Proserpine State Forest
Reptilia	Colubridae	Tropidonophis mairii	freshwater snake	C	8-Dec-05	Dittmer - Proserpine State Forest
Mammalia	Dasyuridae	Phascogale tapoatafa tapoatafa	brush-tailed phascogale	C	8-Dec-05	Dittmer - Proserpine State Forest
Aves	Caprimulgidae	Caprimulgus macrurus	large-tailed nightjar	C	8-Dec-05	Dittmer - Proserpine State Forest
Aves	Strigidae	Ninox boobook	southern boobook	C	8-Dec-05	Dittmer - Proserpine State Forest
Amphibia	Hylidae	Litoria wilcoxii	eastern stony creek frog	C	8-Dec-05	Dittmer - Proserpine State Forest

Table 1 Fauna list for Lot 2 USL144133.

The short-beaked echidna- special least concern (SL) is present. Dittmer locals also report the presence of the Proserpine rock wallaby
E - (EPBC & NCA) and the northern quoll E – (EPBC) & C – (NCA) in this area.

The ***QLD Nature Conservation Act*** includes Specific tools for managing protected areas, and for managing wildlife outside of protected areas, include

- park management plans and statements,
- regulatory notices,
- protected area permits and other authorities, licences and permits for the taking or use of wildlife, and
- individual conservation plans or recovery plans for species with particular need

Comment: There is a Recovery Plan for the Proserpine rock wallaby[5]

The overall recovery objective is to improve the conservation status of the Proserpine rock-wallaby through habitat protection, reducing threats to the species and increasing public participation in recovery activities.

On the mainland this rock-wallaby prefers rocky outcrops, rock piles and cliffs within a microphyll/notophyll semi-deciduous dry vine forest. At higher elevations the habitat consists of rocky outcrops, rock piles and rocky creeks within an acacia open forest. The Dittmer mine project contains ideal habitat for this species. The number of colonies of this species there is not known and should be given the expected expansion of the mine if the ML is approved.

Threats include land clearing and habitat fragmentation (developments, quarrying and transport corridors) which are actions associated with mining.

Recommended recovery actions include promoting the conservation and management of Proserpine rock-wallaby habitat off protected areas

Comment: Category C is defined as an Area of High Value Regrowth, in this case within Proserpine State Forest.

The VMA defines HVR as vegetation located—

a) on freehold land, indigenous land, or land subject of a lease issued under the Land Act 1994 for agriculture or grazing purposes or an occupation licence under that Act; and

b) in an area that has not been cleared (other than for relevant clearing activities) for at least 15 years, if the area is— i. an endangered regional ecosystem; or ii. an of concern regional ecosystem; or iii. **a least concern regional ecosystem.**

The endangered Proserpine Rock Wallaby is listed as being within this area, i.e. a least concern regional ecosystem.

The Dittmer mine project (Fisg. 11(a) – (f) will have underground tunnels throughout the MLA area and there may be adverse impacts on threatened species habitats if subsidence and/or new faulting pr other forms of surface cracking occur

[5] https://www.dcceew.gov.au/sites/default/files/documents/petrogale-persephone-recovery-plan.pdf

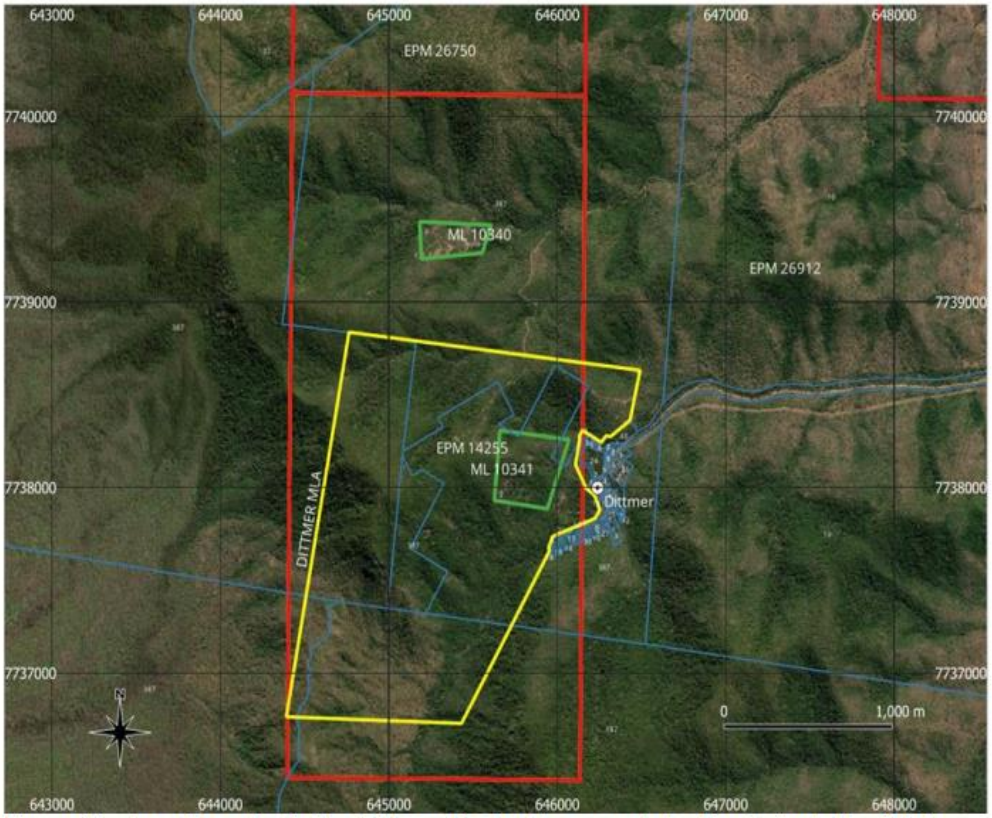

Figure 2 – Location of existing Dittmer Project tenements in Proximity to the MLA

Fig. 11(a) MLA 100351 is outlined in yellow. The original mine is outlined in blue within that MLA.

Image: MLA100351 and Kelsey Creek and freehold residents and bores

Fig. 11(b) MLA 100351 in relation to Kelsey Creek and Dittmer township

In this image the mine boundary is next to Kelsey Creek

The hill directly behind Dittmer township has rocky outcrops with vine forest consistent with PRW habitat just metres from the township.

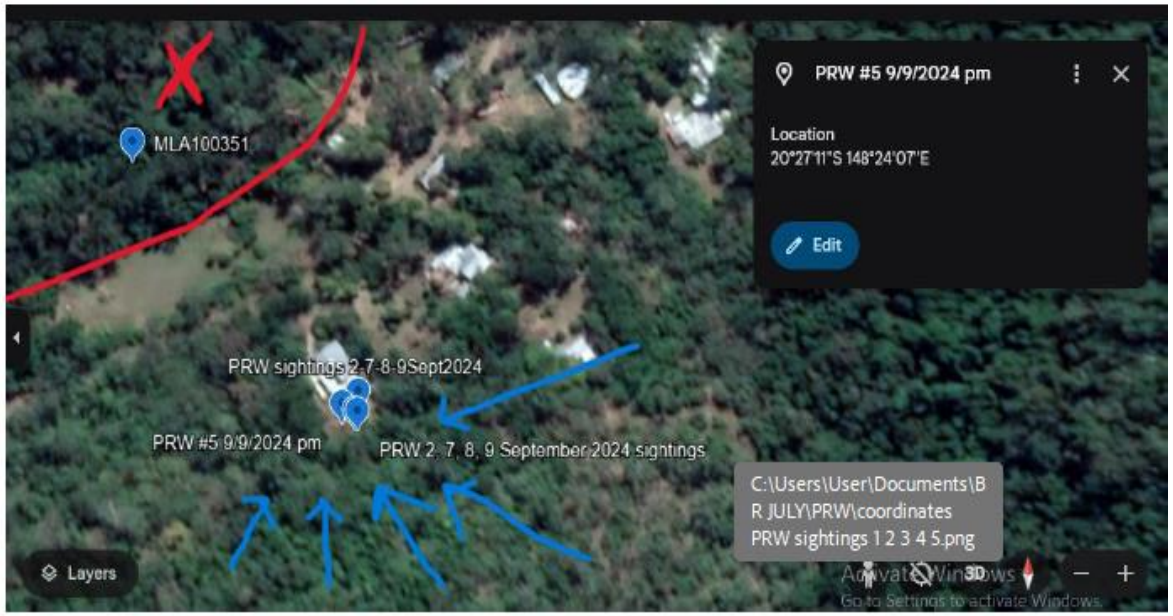

Image: satellite coordinates of PRW sightings

Fig. 11(c) Satellite coordinates for Proserpine wallaby sightings both in the MLA 100351 site and in the Dittmer township vegetation.

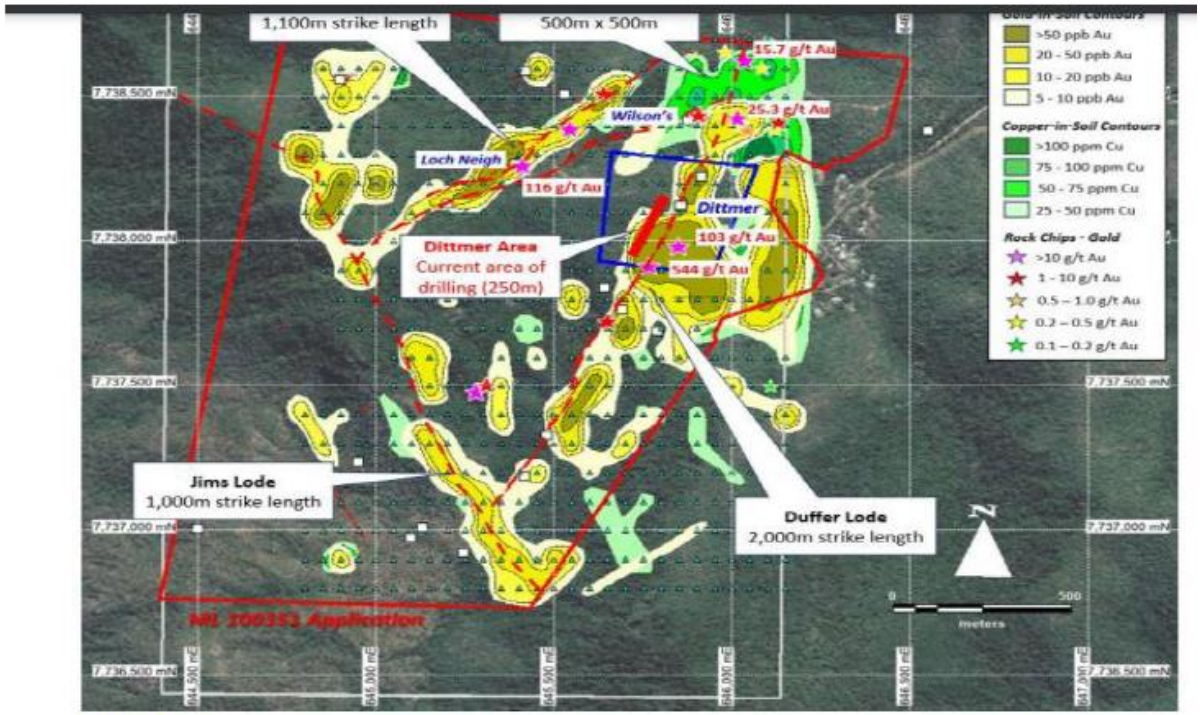

Figure 2 - *Plan view of the Dittmer prospect area with gold and copper-in-soil anomalies and significant rock chip results.*

Fig. 11(d) The map shows gold-in-soil anomalies across Kelsey Creek into part of the edge od Dittmer township.

How would drilling or underground mining there affect this creek, township and wildlife utilising the creek water and riparian habitat?

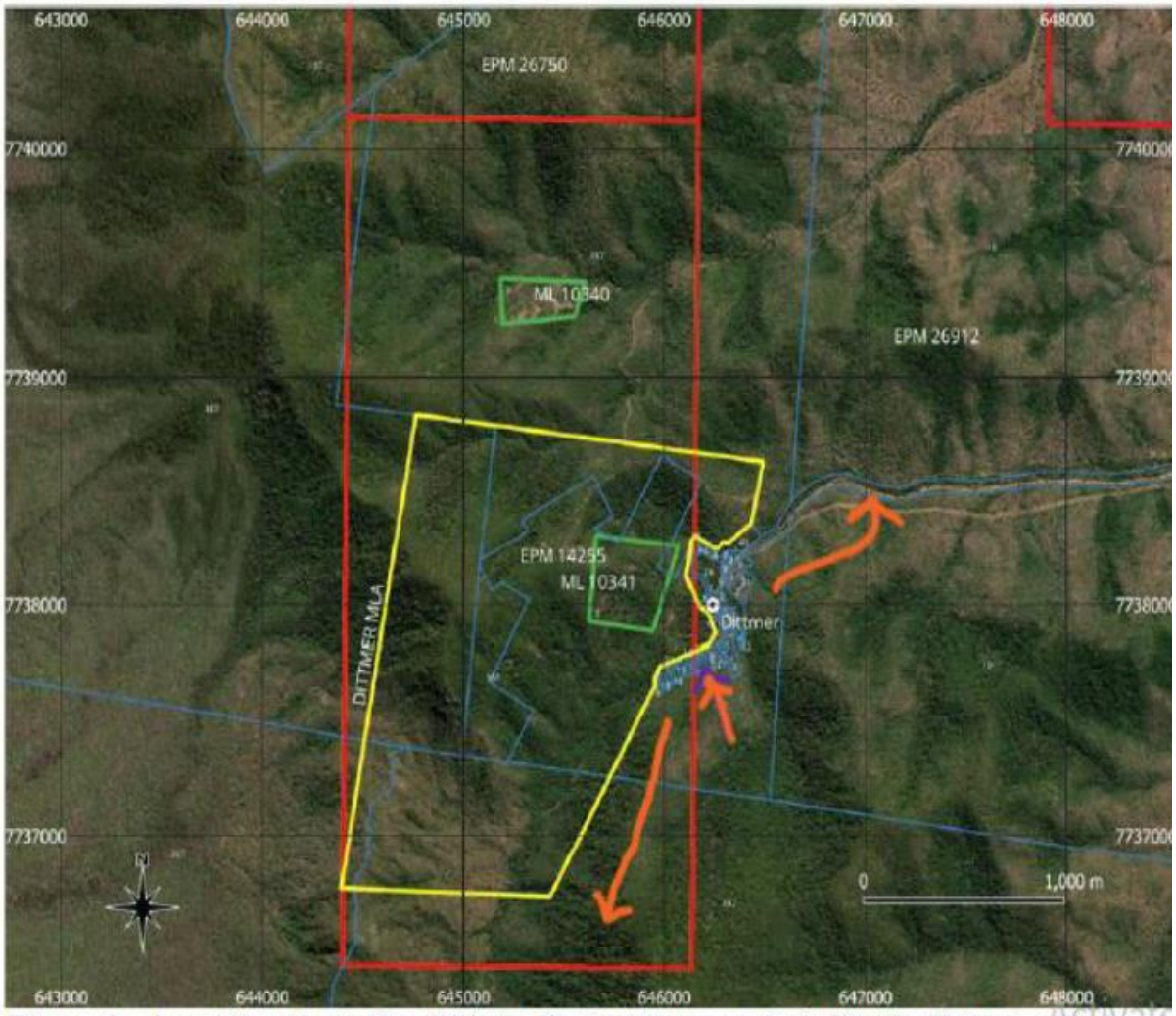

Figure 2 – Location of existing Dittmer Project tenements in Proximity to the MLA

Fig. 11(e) Water access for wildlife near Ditmer township would need to be across MLA 100351 from the west. On the right where they could access Kelsey Creek they would have to navigate Ballymore predicted road trains carrying ore on the dirt access road (red arrows) which puts

them at risk of death each time they try to gain access to essential drinking water. Creek access to some seven tributaries to Kelsey Creek in this area could be lost for wildlife including the PRW, thus reducing their habitat.

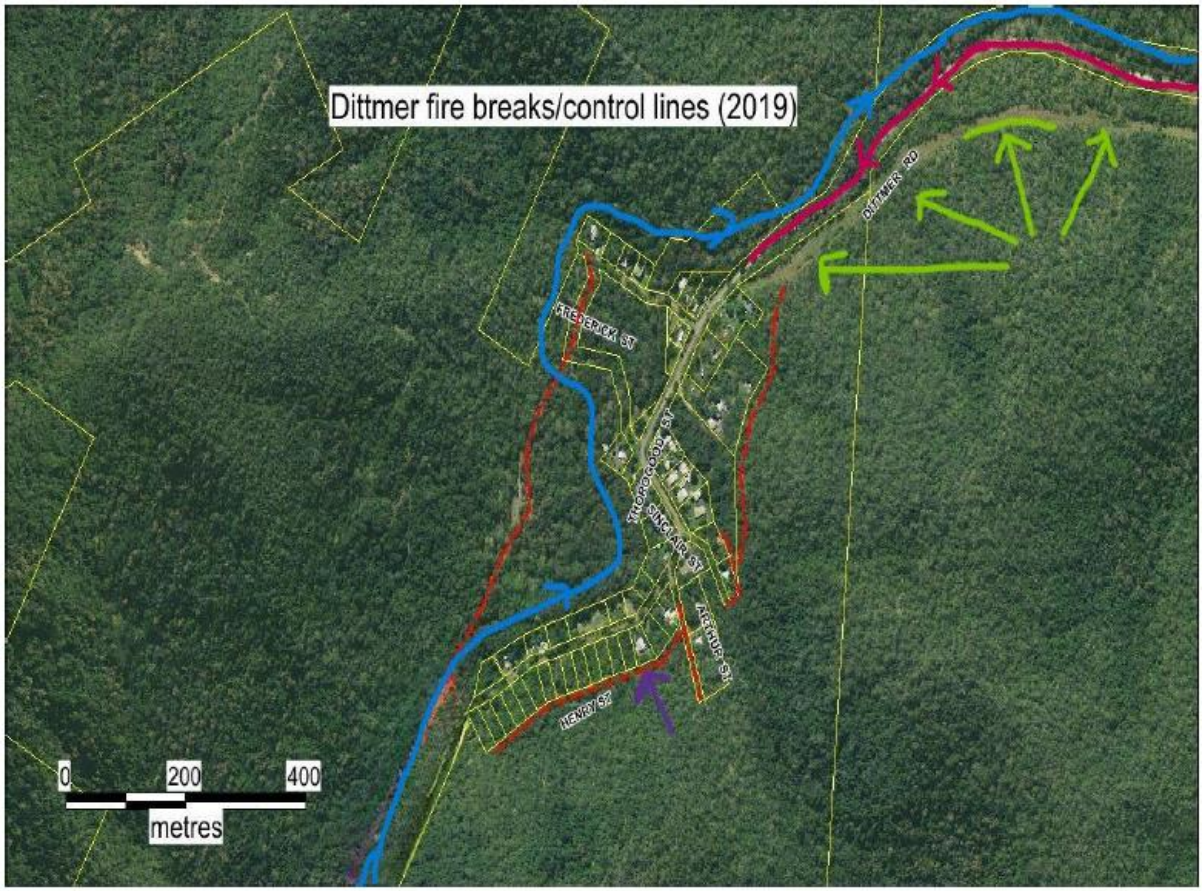

Image: Red line shows main access road into Dittmer village-light green shows road farmer cleared through mapped MNES essential habitat [wider than main access road]- creek is shown in blue.

Fig. 11(f) Access roads for Dittmer township and loss of essential habitat for the PWR.

Environmentally Sensitive Areas downstream of the Dittmer mine project MLA100351 to Repulse Bay and the GBR WHA (0-46km)

Category A

- the Great Barrier Reef Region under the Great Barrier Reef Marine Park Act 1975 (Cwlth);

Category B – Most of these sections apply.

- (a) any of the following areas under the Nature Conservation Act 1992—
  - (ii) an area of critical habitat or major interest identified under a conservation plan;

    The Curlew sandpiper and Eastern curlew are critically endangered migratory shorebirds present within the Repulse Bay shorebird habitat.

- (b) an area subject to the following conventions to which Australia is a signatory—
  - (i) the 'Convention on the Conservation of Migratory Species of Wild Animals' (Bonn, 23 June 1979); migratory shorebirds in Repulse Bay, Proserpine River Estuary and Goorganga Wetlands.
  - (ii) the 'Convention on Wetlands of International Importance, especially as Waterfowl Habi(Ramsar, Iran, 2 February 1971); Proserpine-Goorganga Wetland of National Importance in Australia (DIWA).
  - (iii) 'Convention Concerning the Protection of the World Cultural and Natural Heritage' (Paris, 23 November 1972, Great Barrier Reef World Heritage Area.

- (c) a zone of a marine park under the Marine Parks Act 2004;
  - Repulse Bay National Marine Park: Habitat Protection.

- (g) a feature protection area, State forest park or scientific area under the Forestry Act 1959
  - Proserpine State Forest

- (h) a declared fish habitat under the Fisheries Act 1994
  - Repulse Bay FHA Class A

- a place in which a marine plant under the Fisheries Act 1994 is situated;
    - Coast of the Goorganga wetlands in Repulse Bay

- (j) an endangered regional ecosystem identified in the database known as the 'Regional ecosystem description database' kept by the department
    - RE8.3.5 Endangered ecosystem for the endangered Red goshawk

Only the following types of mining are, or will be, authorised under the relevant mining lease— i. alluvial mining; ii. clay pit mining; iii. dimension stone mining; iv. **hard rock mining;** v. opal mining; vi. shallow pit mining.

Standard EA conditions

Schedule A – General conditions

Financial Assurance

The amount Ballymore Resources has declared would appear to be far too low given the high number of downstream places of environmental significance including MNES and MSES matters that are at risk of adverse impacts from the mine during and after its lifetime as well as the on-site risks if subsidence and/or faulting and surface cracking is caused by the underground tunnelling activities.

Land disturbance

A2: The holder of the environmental authority must ensure that the **area and duration of disturbance to land and vegetation are minimised.**

Note 3 - To minimise the area and duration of disturbance to land and vegetation the following measures or similar measures can be used: - altering work practices to avoid or minimise the generation of dust; - scheduling activities for times when they will have least impact; - spraying water on roads and tracks; - revegetating disturbed areas as soon as practicable; - leaving or creating wind breaks or screening; and - installing pollution control equipment (e.g. fitting bag filters or a cyclone to dust generating equipment).

Air quality A3: The holder of the environmental authority must not cause an unreasonable release of dust.

Noise emissions A4: The holder of the environmental authority must not cause unreasonable noise at a noise sensitive place.

Note 5 - To prevent causing unreasonable noise at a noise sensitive place, the following measures or similar measures can be used: - construct and maintain noise barriers and enclosures around noisy equipment or along the noise transmission path; - implement noise reduction measures at noise sensitive places; - provide and maintain low noise equipment; - carry out routine maintenance on fans to minimise bearing noise; - repair or replace defective mufflers of vehicles and plant equipment; and - limit the hours of operation to between 7am to 6pm from Monday to Saturday. Note 6 -If aircraft are used for mining related activities, operate them so as to minimise disturbance to livestock (e.g. helicopters).

Erosion and Sediment Control A5: The holder of the environmental authority must design, install and maintain adequate banks and/or diversion drains to minimise the potential for storm water runoff to enter areas disturbed by mining activities.

A6: The holder of the environmental authority must design, install and maintain adequate erosion and sediment control structures wherever necessary to prevent or minimise erosion of disturbed areas and the sedimentation of any watercourse, waterway, wetland or lake.

Note 7 - For information on the design and construction of sediment ponds refer to the "Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland", Part C, "Site Water Management".

Note 8 – Regularly clean out sediment traps, ponds and drains and maintain them in effective working order, until erosion stability has been achieved in disturbed areas. Note 9 – The capacity of sediment traps, ponds, drains and banks should not be reduced below 70% of their design capacity

Comment: As climate change proceeds there will be a need to design for the expected larger and more intense rainfall events in this MLA area which has the highest average annual rainfall in the Proserpine River catchment. Designing for 500- and 1,000-year events should now be the standard as they are likely to become the 1/100 year event in the future.

That would help reduce the risk of contaminated surface runoff and groundwater leaving the ML area and adversely impacting MNES and MSES and other high value matters downstream to the GBR via Kelsey and Lethe Brook Creeks.

Topsoils and overburden management

A7: The holder of the environmental authority must ensure that topsoil is removed and stockpiled prior to carrying out any mining activity. Prevent or minimise the mixing and erosion of topsoil and overburden stockpiles.

Comment: Does overburden also include rock excavated from the tunnels. That was supposed to be loaded on trucks elsewhere in the MLA and processed. But no information has been provided on where that facility would be located. It is important to know where.

Note 10 – To separate topsoil and overburden and to prevent or minimise the erosion of these stockpiles the following measures or similar measures can be used: - identify topsoil and overburden layers prior to mining; - store topsoil and overburden in separate stockpiles, install silt fences or bunding around the

stockpiles. - establish and maintain a temporary cover crop on the topsoil stockpiles; - limit the height of topsoil stockpiles to 2 m; and - where practical reuse stockpiled topsoil within 12 months of storage.

Hazardous contaminants

A8: The holder of the environmental authority must plan and conduct activities on site to prevent any potential or actual release of a hazardous contaminant.

Note 11 - **Section 443 of the Environmental Protection Act 1994** makes it an offence to cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Note 12 - **Section 442 of the Environmental Protection Act 1994** makes it an offence to release a prescribed contaminant. A prescribed contaminant is a contaminant prescribed by an Environmental Protection Policy.

Comment: Gold mining can contaminate the environment with a variety of chemicals, including:

- **Heavy metals**: Such as arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc. These metals can be found in gold ore bodies and mine tailings.
- **Acid mine drainage (AMD)**: This is a strong acid that forms when pyrite in mining ores is exposed to oxygen in tailings storage facilities (TSFs). AMD can acidify soil and make heavy metals more available to plants.
- **Petroleum byproducts**: These can be found in mine waste.
- **Cyanide**: This can be found in mine waste.

Gold mining can have serious impacts on the environment, including:

- **Water contamination**: Gold mining can contaminate nearby water resources with toxic chemicals.
- **Soil contamination**: Gold mining can contaminate soils with heavy metals.
- **Health risks**: Exposure to mercury can cause a range of health issues, including lung damage, nausea, vomiting, and brain functioning changes.

Comment: Ballymore Resources should supply a list of expected contaminants from their mining operations within ML100351 and a Management Plan that explains how they will be tracked, handled and treated to prevent their movement offsite. Those records should be reviewed by DESI frequently to ensure Ballymore is able to meet its obligations to prevent any pollution moving offsite. The Dittmer community and other members of the public should have timely access to this information which ideally should be posted online.

There should also be a downstream surface and groundwater water quality monitoring program to check on increase in contaminant concentrations that may have originated from the mining sites in ML100351.This should be part of the EA conditions.

A9: The holder of the environmental authority must ensure that spills of hazardous contaminants are cleaned up as quickly as practical. Do not clean up such spillage by hosing, sweeping or otherwise releasing such contaminants to any watercourse, waterway, groundwater, wetland or lake.

Note 13 -To prevent or minimise any potential or actual release of a hazardous contaminant the following measures or similar measures can be used:

Environmental Protection Act 1994

Subdivision 2 Content and submission of contaminated land investigation documents

388Application of sdiv 2

(1)This subdivision applies if—

(a)a site investigation report for relevant land is required to be prepared under an investigation notice for the land; or

(b)a validation report for relevant land is required to be prepared under an environmental enforcement order issued under section 362(2) for the land; or

(c)a draft site management plan is required to be prepared under section 391; or

(d)a contaminated land investigation document is required to be prepared under a notice given or order made under this Act.

site management plan, for relevant land, means a plan for managing the environmental harm that may be caused by the hazardous contaminant contaminating the land by applying conditions to the use or development of, or activities carried out on, the land.

Note 15 – "A Site Management Plan* approved under Chapter 7, Part 8 of the Environmental Protection Act 1994, may be required by the administrating authority for sites recorded on the Environmental Management Register* or the Contaminated Land Register*. Such sites may include **acid producing waste rock stockpiles or tailings dams containing acid producing wastes.**

A10: The holder of the environmental authority must, where practical, separate acid producing waste rock from the benign waste. **Acid producing waste rock may be temporarily stockpiled in the catchment of the tailings dam, in a mine excavation or in an impermeable bunded area with a restricted catchment.**

Comment: Ballymore claims it will not produce acid wastes, but the ore does contain pyrite which when exposed to air can produce acid waste. All golf mines contain pyrite.

How would Ballymore prevent the production of acid mine drainage?

A11: Where practical, the holder of the environmental authority must dispose of the acid producing waste rock in the tailings dam or mine excavation and backfill as soon as practical. Where not practical, bury acid producing waste rock in an excavation or pit and backfill as soon as practical. Backfill all mine excavations, other excavations and pits containing acid producing waste rock with benign, low permeability material and seal the mine excavation, other excavation or pit with a compacted capping layer at least 1m thick.

Comment: Given this gold mining operation is at high elevation and upstream of places of high MNES and MSES values there should be no doubt that waste rock producing acid drainage should be handled so there is zero risk of downstream contamination. Otherwise the mining should not proceed. Where is the research by Ballymore Resources to report on the level of risk of this issue and management plan?

Note 16 – For detailed information on the management of acid mine waste material refer to the "Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland", Part B, 'Assessment and Management of Acid Drainage. (1995) and the 'Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland'[6]

Note 17 – The owner or occupier of a mining lease must notify the administering authority if they become aware that a **Notifiable Activity* listed in schedule 4 of the Environmental Protection Act 1994,** is being carried out on the land within 30 days, by giving notice to the administering authority in the approved form. For example, a mining operation that generates waste materials that contain hazardous contaminants must notify the administrating authority that this activity is being carried out. Refer to **section 371 of the Environmental Protection Act 1994.**

[6] https://www.publications.qld.gov.au/dataset/acid-sulfate-soil-guidelines for the latest versions.

Notifiable activities[7]

Notifiable activities are activities that have the potential to cause land contamination.

24 Mine wastes—

1. storing hazardous mine or exploration wastes, including, for example, tailings dams, overburden or waste rock dumps containing hazardous contaminants; or
2. exploring for, or mining or processing, minerals in a way that exposes faces, or releases groundwater, containing hazardous contaminants.

Comment: Need a description of the route that is planned and the location of the processing facility that Ballymore Resources proposes off site and how such wastes will be treated to prevent any pollution from that site.

25 Mineral processing—chemically or physically extracting or processing metalliferous ores.

Metalliferous ores are ores that contain metals, such as copper, **gold,** silver, or molybdenum

“Metalliferous mineral product" means the material resulting from the processing of a metalliferous mineral including any concentrate of an ore, any precipitate of a metalliferous mineral or any metal bullion.

"Mining" means the activity of extracting from the earth substances that become metalliferous minerals.

In the case of ore that is customarily milled, concentrated, agitation leached, or vat leached, mining includes all activity from the breaking of ground to the delivery of ore to the primary crusher, including blasting, loading, hauling, including hauling of waste, and dumping.

[7] https://www.qld.gov.au/environment/management/environmental/contaminated-land/registers/notifiable-activities#:~:text=Notifiable%20activities%20are%20activities%20that,disposing%20of%20abrasive%20blasting%20material.&text=washing%20aircraft%20used%20for%20aerial%20spraying.

"Processing" means any non-mining activity that transforms metalliferous minerals into metalliferous mineral products including precipitating, crushing, concentrating, smelting and refining. "Processing" does not include manufacturing or fabrication or other transformation activities beyond refining.[8]

Eligibility criteria and standard conditions for mining lease activities—Version 2[9] (cont.)

Nature conservation

A12: The holder of the environmental authority must prevent the spread of declared plants by ensuring that all vehicles and machinery are adequately cleaned before taking the vehicles and machinery out of a declared plant area.

Comment: How will Ballymore Resources ensure that adequate cleaning will occur so that new pest species will not be introduced into MLA100351? Mining sites are notorious for causing the spread of weed species.

Note 18 - Every precaution must be taken to ensure there is no dispersal of Parthenium weed or the seed of any other declared plant within the meaning of the Land Protection (Pest and Stock Route Management) Act 2002, as a result of mining or as a result of access to the area of the mining lease.

Note 19 – The Department of Agriculture and Fisheries provide Pest Fact sheets for declared plants in Queensland as well as clean down procedures for motor vehicles and machinery. For advice on declared plant areas contact the Department of Agriculture and Fisheries or your Local Government.

A13: The holder of the environmental authority must not carry out activities:

Appendix 3: Environmentally Sensitive Areas

[8] https://www.azleg.gov/ars/42/05201.htm#:~:text=%22Metalliferous%20mineral%22%20means%20copper%2C,is%20severed%20within%20this%20state.

[9] **https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf**

Category B Environmentally Sensitive Areas

A category B environmentally sensitive area means any of the following—

(a) any of the following areas under the Nature Conservation Act 1992—
(ii) an area of critical habitat or major interest identified under a conservation plan;
Comment: This would include the endangered **Proserpine rock wallaby** which is in the MLA100351
There are also many other such threatened species downstream of this ML discussed elsewhere in this submission.

Prior to carrying out activities in **a category C environmentally sensitive area**, the holder of the environmental authority must consult with the relevant administering authority. If it is determined through consultation that additional conditions are necessary, the holder must comply with those conditions.

Eligibility criteria and standard conditions for mining lease activities (Cont.)[10]

Category C Environmentally Sensitive Areas

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
Declared Catchment Areas; Declared Irrigation and Irrigation Project Areas; and Water Reservoirs and Drainage Areas.	*Water Act 2000*, various Water Board Acts	Department of Natural Resources and Mines and/or Relevant Storage Operator or Board

Comment: See also the sections 12-14 of the **Water Resource (Whitsunday) Plan**[11] which covers required ecological outcomes. These mainly apply to management of the extensive irrigated areas along Kelsey Creek but could also apply to changes to downstream water quality and quantity from the Ballymore mine operations over its lifetime and should be evaluated under the Environmental Authority as the mine will engage in dewatering and management of the quality and quantity of surface flows from MLA100351. There are 58

[10] https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf p. 32.
[11] https://www.legislation.qld.gov.au/view/whole/html/inforce/current/sl-2010-0017#cd-status-he

blocks in EPM 26912 so there are likely to be more mining projects there over time and now is the time to address present and future potential impacts especially downstream.

Whitsunday Water Plan sub catchments. Map is in Schedule 2.[12]

The Dittmer mine project ML and EPC tenures are within the Whitsunday Regional Council and Proserpine River sub catchment of the Burdekin River Basin.

Comment: The Dittmer mine project is in Section B, the Proserpine sub catchment in the headwaters area of Kelsey Creek (Fig. 12) Peter Faust Dam in sub catchment A can release flows into Kelsey Creek below the Dittmer mine project area, so will the mine be taking unallocated water from Peter Faust Dam and if so how much, and will that affect flows to the irrigated area in the Kelsey Creek and Lethe Brook catchments downstream and MNES and/or MSES**?** How will the EA evaluate that?

[12] https://www.legislation.qld.gov.au/view/whole/html/inforce/current/sl-2010-0017

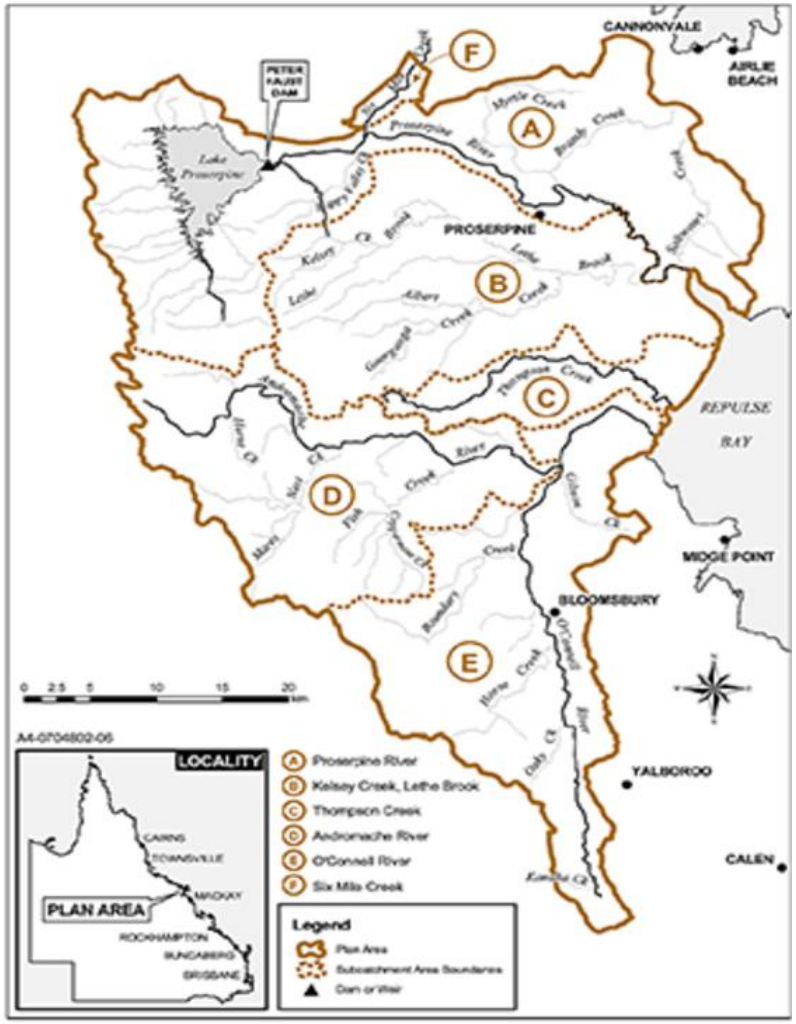

Fig. 12 Whitsunday Water Plan sub catchments. Map is in Schedule 2.[13]

[13] https://www.legislation.qld.gov.au/view/whole/html/inforce/current/sl-2010-0017

Eligibility criteria and standard conditions for mining lease activities—Version 2[14]

Nature conservation (cont.)

12 General ecological outcomes

(1) Each of the following is a general ecological outcome for the (Whitsunday Water) plan area—

(a)to maintain the natural variability of flows that support the habitats of native plants and animals and migratory birds in watercourses, floodplains, wetlands, lakes and springs.

(b)to provide for the continued capability of 1 part of a river system to be connected to another, including by maintaining flood flows that—

(i)allow for the movement of native aquatic animals between riverine, floodplain, wetland, estuarine and marine environments; and

(ii)deliver nutrients and organic matter throughout the plan area to support natural processes such as breeding, growth and migration in riverine, floodplain, wetland, estuarine and marine environments; and

(iii)deliver water and sediment throughout the plan area to support river-forming processes;

(c)to minimise changes to natural variability in water levels and to support natural ecological processes, including maintaining refugia associated with waterholes and lakes;

(d)to promote improved understanding of the matters affecting flow-related health of ecosystems in the plan area;

(e)to provide a flow regime that—

(i)supports native fish passage within watercourses in the plan area; and

(ii)supports ecological productivity in the receiving waters of the Great Barrier Reef, inshore reefs and Repulse Bay; and

(iii)maintains delivery of fresh water to the estuaries of watercourses in the plan area and Repulse Bay; and

[14] https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf

(iv)maintains natural sedimentation processes to support delivery of sediment and nutrients to estuaries in the plan area.

(2)In this section—

native fish passage means the natural movement patterns of native fish species required to maintain the biological integrity of the species.

refugia means habitats or places supporting populations of animals or plants not able to live elsewhere in the surrounding landscape.

Example of refugia in an aquatic system—

Habitats or places where animals or plants may take refuge from drought conditions, floods and high flows, high water temperatures and predation by other animals.

13General ecological outcomes relating to the connectivity of groundwater and surface water

Each of the following is a general ecological outcome relating to groundwater in the plan area—

(a)to maintain groundwater contributions to the flow of water in watercourses, lakes and springs;

(b)to support the ecosystems dependent on groundwater, including, for example, riparian vegetation, wetlands and waterholes;

(c)to provide continued connectivity between watercourses, lakes and springs, and aquifers.

14Specific ecological outcomes

Each of the following is a specific ecological outcome for the plan area—

(a)to minimise adverse impacts on the ecology and morphology of watercourses, lakes and springs in the Proserpine River Water Supply Scheme used for taking supplemented water while recognising changes to the flow regime of the watercourses, lakes and springs resulting from water resource development;

(b)to maintain flood flows to the estuarine and marine environments of Repulse Bay to stimulate breeding, growth and migration of native aquatic animals;

(c)to maintain the natural variability of flood flows that inundate, and deliver nutrients, organic matter and sediment to, the wetlands of the area known as the Proserpine–Goorganga Plain Wetland.

And

22 Matters to be considered for environmental management rules

(1)In deciding the environmental management rules to be included in the resource operations plan, the chief executive is to consider—

(a)the streamflows required to maintain the following—

(i)the longitudinal connectivity of low flow habitats throughout the subcatchment areas in the plan area;

(ii)the wetted habitats at riffles and other streambed features;

(iii)the natural seasonality of flows and zero flows;

(iv)the replenishment of refuge pools that enable movement of instream biota;

(v)groundwater flows;

(vi)the contributions from aquifers to the flow of water in watercourses;

(vii)the lateral connectivity between rivers in the plan area and their adjacent riverine environments, including floodplains; and

(b)the impact the taking of, or proposed taking of, or interfering with, water may have on the following—

(i)water quality;

(ii)the natural movement of sediment and nutrients; (iii)the inundation of habitats;

(iv)the movement of fish and other aquatic animals;

(v)the recreation and aesthetic values of the plan area;

(vi)cultural values including, for example, cultural values of local Aboriginal or Torres Strait Islander communities.

(2)Subsection (1) does not limit the matters the chief executive may consider.

And

Subdivision 5 Dealing with unallocated water under resource operations plan generally

33 Preparing and implementing process under the resource operations plan generally

(1) Unallocated water is dealt with under a process stated in the resource operations plan.

(2) In preparing and implementing the process, the chief executive is to consider the following—

(f) whether the proposed taking or interfering is likely to have a direct adverse effect on groundwater flows

Comment: An Environmental Management Plan that addresses likely ecological impacts and the levels of risk of these impacts is needed.

Eligibility criteria and standard conditions for mining lease activities (Cont.)[15]

Category C Environmentally Sensitive Areas

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
State Forest or Timber Reserves	*Forestry Act 1959*	Department of National Parks, Sport and Racing

Comment: Ballymore Resources MLA 100351 includes part of Proserpine State Forest (Fig. 13). There will be numerous mining tunnels (number yet unknown) under that part of this state forest.

[15] https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf p. 32.

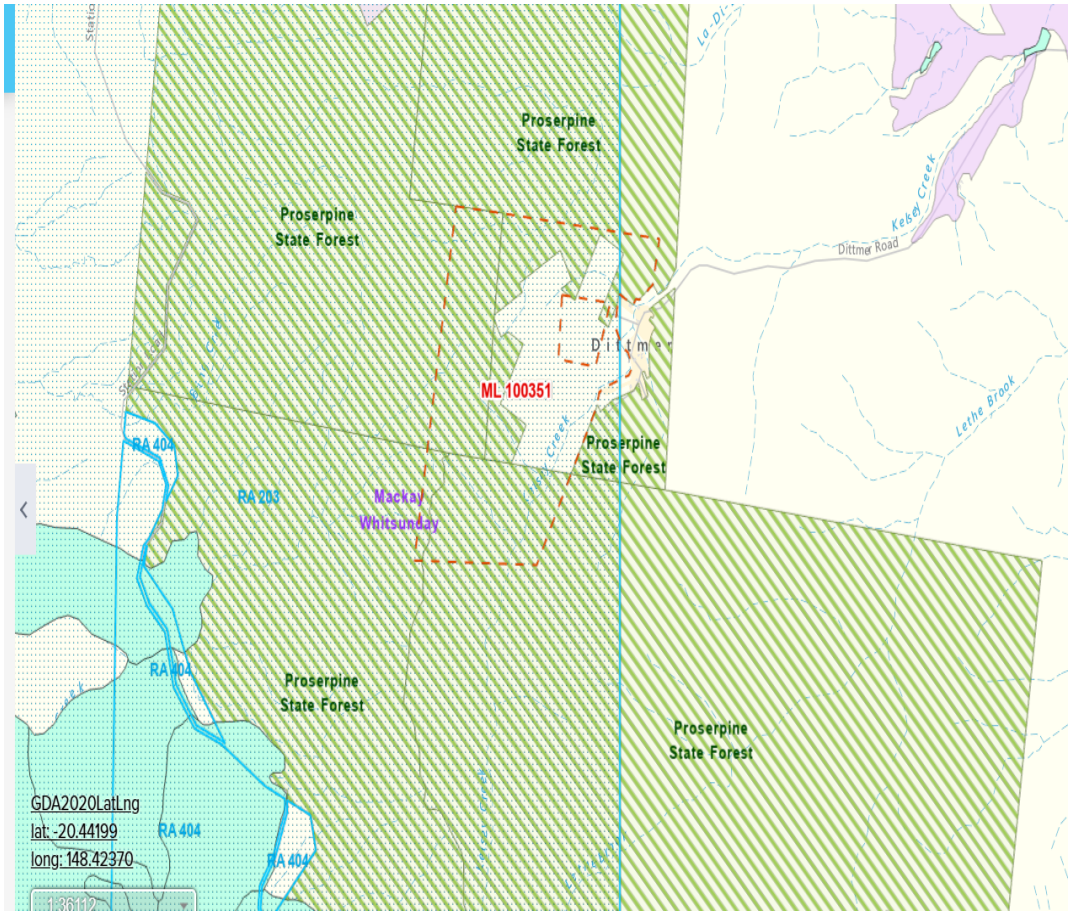

Fig. 13 Proserpine State Forest is a Category C Environmentally Sensitive Area and ML100351 is partly within this state forest.

The Dittmer mine project tunnels will be under this forest (Fig. 14) if the ML is approved (Fig. 14).

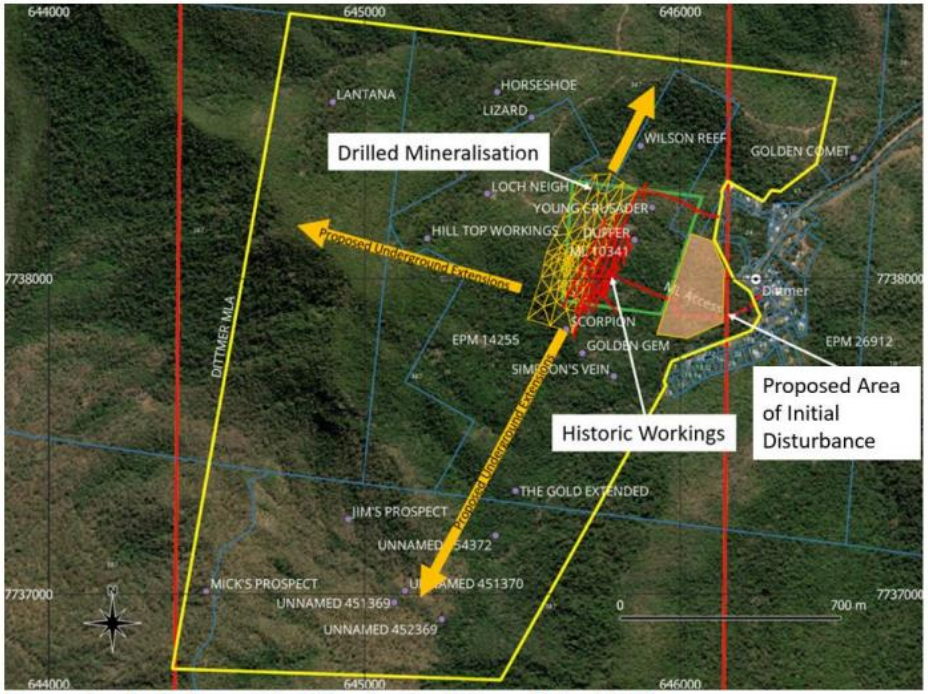

Figure 4 – Preliminary Mine Plan for the Dittmer Project MLA.

Fig.14 Dittmer mine project plans tunnels that will be under Proserpine State Forest **State Forestry Act 1959**

Comment: This Act does not directly deal with underground mine of a state forest. It does

state that mining can occur in state forest, but refers to surface not underground mining.

Division 1 Management generally

33 Cardinal principle of management of State forests

(1)The cardinal principle to be observed in the management of State forests shall be the permanent reservation of such areas for the purpose of producing timber and associated products in perpetuity and of protecting a watershed therein.

(2)The chief executive must ensure each State forest is used and managed in the way the chief executive considers appropriate to achieve the purposes of this Act, having regard to—

(a)the benefits of permitting grazing in the area; and

(b)the desirability of conservation of soil and the environment and of protection of water quality; and

(c)the possibility of applying the area to recreational purposes.

34 Use of State forests

(3)Notwithstanding any lease, licence, permit or other right or authority (other than a plantation licence) granted under this or any other Act, the chief executive may within any State forest from time to time construct, carry out, improve, maintain, operate, protect, **control**, and otherwise manage any silvicultural or other works of any description whatsoever **which the chief executive considers necessary or desirable for the proper utilisation and management of the State forest or to carry out the objects and purposes of this Act** (whether in relation to the State forest or not)

Impacts of underground mining:[16]

Environmental impact due to subsidence is a global issue caused by underground resource extraction of oil, groundwater and minerals. The development of vertical and horizontal displacements and strains, tilts and curvature and permeability changes of rock strata are common effects of such extraction. Different underground mining methods can influence the nature of subsidence in addition to the timing of subsidence development (Bell et al., 2000). Subsidence may be continuous, causing elongated, unstepped troughs above each longwall, or discontinuous where large displacements over short areas cause discontinuous steps in the surface (Bian et al., 2010).[17]

[16] Manoj Khanal, Jane H. Hodgkinson. CSIRO Minerals. Subsidence prediction versus observation in Australia: A short comment. Environmental Impact Assessment Review, Volume 86, January 2021, 106479. https://doi.org/10.1016/j.eiar.2020.106479

[17] Zhengfu BIAN [a], Hilary I INYANG [b], John L DANIELS [b c], Frank OTTO [d], Sue STRUTHERS [e]. Environmental issues from coal mining and their solutions. Mining Science and Technology (China)
Volume 20, Issue 2, March 2010, Pages 215-223. https://doi.org/10.1016/S1674-5264(09)60187-3

Quanyuan et al. (Quanyuan et al., 2009) reported on subsidence caused by underground mining in China, showing that **it has damaged the original ecological environment**, resulting in great changes in the landscape's spatial structure and changes the nature of potential land use. Prime faming land in eastern China is now frequently or permanently flooded due to mining-induced subsidence, and **subsidence caused by underground mining in steep highlands has led to slope failure and soil loss (Bian et al., 2010).**

Subsidence is one of the major parameters that underground mining companies must accurately predict, monitor, measure, audit and report on to the relevant authority, in order to manage or prevent negative flow-on impacts. Impacts that may need management as a result of subsidence and subsequent changes to topography may include changes to ground- and surface water flow. The **predicted subsidence levels caused by underground mining proposed before a mine is excavated, is typically reported in planning documents, which must be approved by the relevant authority.**

Planning in all Australian states varies slightly but **each state requires a subsidence prediction plan to be cited and authorised by the governing body prior to mining**. Additionally, a report is required to be submitted to the relevant authority within a prescribed timeframe after completed mining of each underground panel (for example, this is termed the 'End of Panel' report in NSW). This is designed to provide a comparison of predicted subsidence with the observed subsidence values. ***Subsidence/mining audits are useful for informing improved planning to reduce future mining impacts on the environment***. Further, assessment of deviations from the planned footprint can be tracked and managed or realigned through such audits. Therefore, an end of panel report (or equivalent) that clearly states the predicted and observed measurements is useful. Prior to the commencement of mining, a report commonly known as an environmental impact statement (EIS) (also known as an environmental impact assessment (EIA)) must be lodged with the relevant state government. This is a systematic assessment that predicts potential environmental impacts and presents the proposed management and mitigation plans to reduce those impacts**. EIAs must be approved by government prior to mining commencement**. It is considered to be **a planning tool**, constituting a major part of planning process. A post-auditing procedure is required to assess the accuracy of the predictions (Dipper et al., 1998). ***The EIA mostly emphasises early prevention of environmental damage and is a decision making aid as well as a tool to help achieve sustainable environmental management (Dipper et al., 1998***). The value and importance of post-auditing has been highlighted by various authors (Dipper et al., 1998; Bailey and Hobbs, 1990; Tomlinson and Atkinson, 1987a; Tomlinson and Atkinson, 1987b). A well-delivered post-auditing method can develop stakeholders' confidence in the EIA process and, importantly, in the mining project.

While prediction and risk assessment are necessary prior to mining, and **monitoring and auditing are part of the ongoing environmental management of an operation, the latter two are not integrated into the early stages of the EIA process. No real enforcement of them appears to be in place** (Ahammed, 2007). Audits are a key part of reporting and assessment but can be voluntary, mandatory or statutory (DFAT, A.G, 2016) and varies between states. As the name suggests, the voluntary audits are not compulsory requirements of the regulatory authority and are not required by law. **Mandatory audits are only required by regulatory authorities for mining companies to obtain and maintain mining licenses, leases and**

development approvals. Statutory audits are compulsory under legislation. Audit interval requirements vary from six monthly to every three years depending on the audited parameter and the state for reporting.

Quantifiable parameters, such as subsidence, groundwater levels and water quality should be measured and compared with benchmark or target levels and activities should be realigned or managed whenever possible. Based on 2006 observation, Kuipers et al. (Kuipers et al., 2006) reported that **no systematic comparison of predicted and actual water quality for hard rock mines existed, anywhere in the world**. Their report also found that over 60% of the mines that they studied had mining-related exceedances for surface water, and groundwater quality and 72% of the mines predicted low potential for acid drainage in one or more of the relevant EISs.

Eligibility criteria and standard conditions for mining lease activities (Cont.)[18]

Category C Environmentally Sensitive Areas (cont.)

An area subject to a State Planning Policy that the policy declares is in need of environmental protection

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
An area subject to a State Planning Policy that the policy declares is in need of environmental protection.	*Sustainable Planning Act 2009*	Department of State Development, Infrastructure and Planning

Guideline: State Development Assessment Provisions State Code 9: Great Barrier Reef wetland protection areas

High ecological significance (HES) wetlands that are shown on the Map of Queensland Wetland Environmental Values, are Matters of State Environmental Significance (MSES)

https://environment.desi.qld.gov.au/__data/assets/pdf_file/0026/87218/wetlands-gbr-map.pdf

Magee Road Lethebrook has HES wetlands[19]

[18] https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf p. 32.
[19] https://environment.desi.qld.gov.au/__data/assets/pdf_file/0029/86168/wpa00027.pdf

Comment: The Dittmer mine project is not within this wetland although it is downstream of it.

Specific tools for managing protected areas, and for managing wildlife outside of protected areas, include park management plans and statements, regulatory notices, protected area permits and other authorities, licences and permits for the taking or use of wildlife, and individual conservation plans or recovery plans for species with particular need.

Comment: The Proserpine rock wallaby is an endangered species with particular needs that has a Recovery Plan.

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
Historic Mining Sites	Nil (Inter Departmental Notifications)	Department of Environment and Heritage Protection and the Department of Natural Resources and Mines

Comment: How if at all have legislation and policies changed to address potential pollution from underground gold and copper mines in Queensland, so current and proposed mines do not become "legacy mines" when and after they close?

The Mount Morgan gold and copper and other heavy metals mine left a pollution legacy that continues to this day, with a massive spill after 700mm of rain over three days following cyclone Oswald.[20] Most rain was between 25-26th Jan 2013. This was an open cut mine, not an underground mine, but heavy rainfall is capable of percolating down to groundwater. Heavy metal contamination for the Mount Morgan mine was recorded at least 80 km downstream after this event, so it is feasible that there is a risk of groundwater pollution from the Dittmer mine project some 48.6 km to the GBR, especially over time. We will have fewer cyclones in the future but when they hit, they will be of increasingly higher intensity and potentially longer duration, bringing new rainfall records.

Inadequate rehabilitation over the life of the historic Mount Morgan mine (1882-1981), and since tailings retreatment ceased in 1990, has led to the continued impact of acid mine drainage on the Dee River.

The water quality along the Dee River, for 18 km downstream of the mine site to its junction with Fletcher Creek, is characterised by **low pH, consistently below 3.5** (Howse, 2003). The concentration of metals in surface water is generally elevated adjacent to the mine (Al 191 mg/L, Cd 0.06 mg/L, Cu 16.7 mg/L, Pb 0.10 mg/L and Zn 6.4 mg/L).[21]

[20] https://www.abc.net.au/listen/programs/backgroundbriefing/toxic-mine-water/4518922

[21] https://acquire.cqu.edu.au/articles/thesis/Chemical_impacts_of_acid_mine_drainage_in_the_Dee_River_downstream_of_the_Mt_Morgan_Mine_Central_Queensland_Australia/25271014?file=44646469

Four acid flow events and fish kills occurred in the Dee River between November 2000 and February 2001 as a result of acid mine drainage from the historic Mount Morgan mine. Measurements of pH along the Dee River clearly demonstrated the movement of a slug of acidic water down the river during each of the four flow events (pH 3.0 at 3 km (Kenbula weir), pH 4.8 at 60 km and pH 6.1 at 80 km downstream of the mine site). Laboratory analysis of water samples indicated Al, Cu and Zn concentration orders of magnitude above ANZECC guidelines. Fish kills occurred with each flow event and killed an estimated total of 26,000 fish.

Peak metal concentration in groundwater coincided with high metal levels of acid surface water of the Dee River at two sites (6 km and 38 km downstream of the mine site). Results presented herein support the premise that **metal-rich water originating from the Mt Morgan mine site could infiltrate groundwater, particularly during acid flow events in the Dee River when preceding groundwater levels are low.**

Many historical **underground mines in mountainous or hilly terrain** were carefully located and designed to permit drainage adits to passively dewater as much as possible of the country rock surrounding mineral deposits. This approach readily overcame dewatering problems but effectively maximised the potential for Acid and Metalliferous drainage (AMD) generation and discharge. Despite such lessons from the past, little thought is often given to the post-closure environmental implications of locating and designing mine access portals at current underground mines, with the consequence that many mines discharge AMD-affected water from their portals. This poor-quality drainage is generated from wall rock surrounding the mined area, as well as from **backfilled sulfidic mine wastes**. In addition, modern mines that use block cave methods also generate very large volumes of **highly fractured sulfidic ore** that can remain exposed underground for years, in contact with air and water, and thus generate poor-quality drainage during operations.[22]

As some types of mining operations have evolved from high-grade, low-tonnage underground operations to large-tonnage (with typically high stripping ratio), low-grade open-cut operations over the past 30 to 40 years, the volume of surface material with the potential to create AMD has increased exponentially.

The AMD challenges associated with underground mines are best addressed during the early stages of mine planning, with a focus on prevention and minimisation strategies. **Leading practice strategies** include the following:

• Avoid the need to employ (high-risk) pressure bulkheads after closure by planning to position the mine portal at a topographic high point, ensuring that all unsaturated wall rock and any sulfidic backfill will be passively inundated by natural post-closure groundwater rebound.

• Avoid developing a post-closure mine spill point if possible (depending on local hydrogeology).

[22] https://www.industry.gov.au/sites/default/files/2019-04/lpsdp-preventing-acid-and-metalliferous-drainage-handbook-english.pdf p.136.

• Strategically align decline and development drives to minimise the likelihood of intercepting PAF material during mining. For example, mineralisation types such as volcanic-hosted massive sulfide deposits can have a mineralised footwall and a relatively barren hanging wall. Targeting the latter for development drives could substantially lower PAF waste rock production and therefore AMD risk, provided that the hanging wall is geotechnically competent.

• Segregate waste so that PAF rock can be retained underground for mine backfilling and eventual inundation below groundwater.

• Avoid storing potentially acid forming material (PAF) waste rock and tailings above the final passive minimum mine water spill level if post closure mine spilling is difficult to prevent. All sulfidic backfill wastes may need to be under a minimum 2 m permanent cover by groundwater (Oxley et al. 2008).

Comment: Will the Queensland government department DETSI, (Department of the Environment, Tourism, Science and Innovation (DETSI) and formerly DESI), when deciding whether or not to approve the Dittmer mine project's ML100351 EA, require Ballymore Resources to meet the relevant parts of the mining industry's guidelines as laid out in "Preventing Acid and Metalliferous Drainage: Leading Practice Sustainable Development Program for the Mining Industry" for the final EA for MLA100351? The current application to amend the original 2010 EA permit EPSL00460513 applied for 21/08/2023 does not meet this leading practice sustainable development guide published by the Australian government in 2016. This publication was developed by a working group of experts, industry, and government and non-government representatives.

We do not need yet another Legacy Mine in Queensland, especially in the Whitsundays so close to the GBR. How can DESTI guarantee that?

ESR/2016/2241 Eligibility criteria and standard conditions for mining lease activities (cont.)

Assessment criteria

Hazardous waste dams

A dam is likely to be a hazardous waste dam if:

(1) water quality impacts due to loss of the stored liquid (i.e. in the event of an overflow or a failure of the structure to contain the stored liquid) may result in –

(a) contamination of a water supply for human consumption; or

(b) contamination of a stock water supply; or

(c) environmental damage.

The parameters used to measure water quality are:

i. pH (less than 4 or greater than 8);

ii. salinity (greater than 1500mg/L);

Design, construction, operation and maintenance criteria

Referrable dams The ***Water Resources Act 1989*** requires the Department of Natural Resources to licence referrable dams. All referable dams must be designed by a professional engineer. The plans and design specifications must be submitted to the Department of Natural Resources for approval

Hazardous waste dams

A professional engineer should design all hazardous waste dams. The dams should be designed and located to have the smallest practical catchment area.

The following conditions apply to hazardous waste dams:

(1) dams with a capacity up to 3000m3 are to be constructed as Turkeys Nest* dams;

(2) as far as practical minimise seepage;

(3) the dam should be operated to maintain a minimum freeboard of 1m;

(4) the spillway should be capable of passing **the design flood**, defined as **the peak discharge from a critical duration storm with an annual exceedance probability of 1% (i.e. 1 in 100 yr event);**

Comment: This 1 in 100-year event storm amount will change as climate change proceeds i.e. the 1 in 100 year event will become the 1 in 50 year event or 1 in 20 year event i.e. the frequency of such an event will increase over time, and the spillway will have to be changed to keep up in order to keep discharge within bounds.

Decommissioning criteria Hazardous waste dams A professional engineer should be consulted prior to developing a decommissioning plan for a hazardous waste dam.

Safety controls for dams Provide, install and maintain adequate warning devices, signs and fences to exclude people, stock, birds and wild animals from dams containing hazardous contaminants

Comment: Please provide details.

Appendix 5:

Schedule of environmental management performance

This schedule sets out the performance categories for financial discounts for good environmental management on mining leases.

To qualify for a particular performance category, the holder of the environmental authority must be able to demonstrate that they have satisfactorily met the required performance criteria.

An environmental audit statement must verify the performance category of the environmental authority holder. A record of satisfactory performance can be transferred from one project to the next new project.

Note: While an **Environmental Management System (EMS) based on ISO 14001** is a requirement for performance categories 1, a discount of 15% for implementing an EMS can apply at any time.

Note: If the holder of the environmental authority has demonstrated non-compliance with the standard environmental conditions or an acceptable EMS for the mining project, the administrating authority can reassess the performance criteria and reset the performance category at any time.

Form 7: Monitoring and record keeping summary

Comment: This form is designed for surface activities records for the EA does not cover underground mining.

This project is predominantly for underground mining activities.

Appendix 9:

Technical guidelines Australian Standard 1940 - The storage and handling of flammable and combustible liquids. Standards Australia (1993). AS/NZS 1547

On-Site domestic Wastewater Management, Standards Australia. Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council (2000).

Best Practice Erosion and Sediment Control, International Erosion Control Association (Australasia) (2008).

Farm Water Supplies Design Manual, Department of Primary Industries, (1992).

Good Relations with Landowners, (1995).

Guideline: Activities in a watercourse, lake or spring associated with mining operations (2012)

Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland, Department of Natural Resources (1998).

Land Access Code, Department of Employment, Economic Development and Innovation (2010).

Leading Sustainable Development Program for the Mining Industry, Department of Resources, Energy and Tourism, Commonwealth of Australia. Mine Rehabilitation Handbook, Minerals Council of Australia (1998).

Queensland Acid Sulfate Soil Technical Manual – Soil Management Guidelines, Department of Natural Resources and Mines (2002).

Queensland Water Quality Guidelines, Department of Environment and Resource Management, Queensland (2009).

Road Drainage Design Manual, Department of Main Roads, Queensland (2002).

State Planning Policy 2/02 – Planning and Management Development Involving Acid Sulfate Soils (2002)

The Conservation Status of Queensland's Bioregional Ecosystems, Environmental Protection Agency (1999).

Prepared by: Resources Sector Regulation and Support, Department of Environment and Heritage Protection © The State of Queensland (Department of Environment and Heritage Protection) **2015**

Comment: None of these documents directly refers to underground mining requirements for minerals.

Nothing dates after 2012. The Mount Morgan major pollution event dates from 2013.

What reforms after 2013, if any, were introduced to address EA requirements to prevent downstream pollution events especially from underground gold and copper mines?

…

Need for a new Environmental Authority for the Dittmer mine project MLA100351.

The proposed Ballymore Resources Pty Ltd Dittmer mine project is located within the Clarke Range in the Kelsey Creek section of the Great Barrier Reef Proserpine River sub catchment of the Burdekin River Basin at an elevation up to 450m above sea level. It is also within and surrounded by Proserpine State Forest.

This project site is some 48.6km upstream of Repulse Bay and its Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area (Fig. 15). Both the mining leases for this project and the downstream area contain many Matters of National and State Environmental Significance (MNES) and (MSES) as

well as the Proserpine-Goorganga nationally important wetland, and in Repulse Bay a significant coastal turtle nesting sites, dugong protection site, a class A Fish Habitat Atrea and GBR Marine Park.

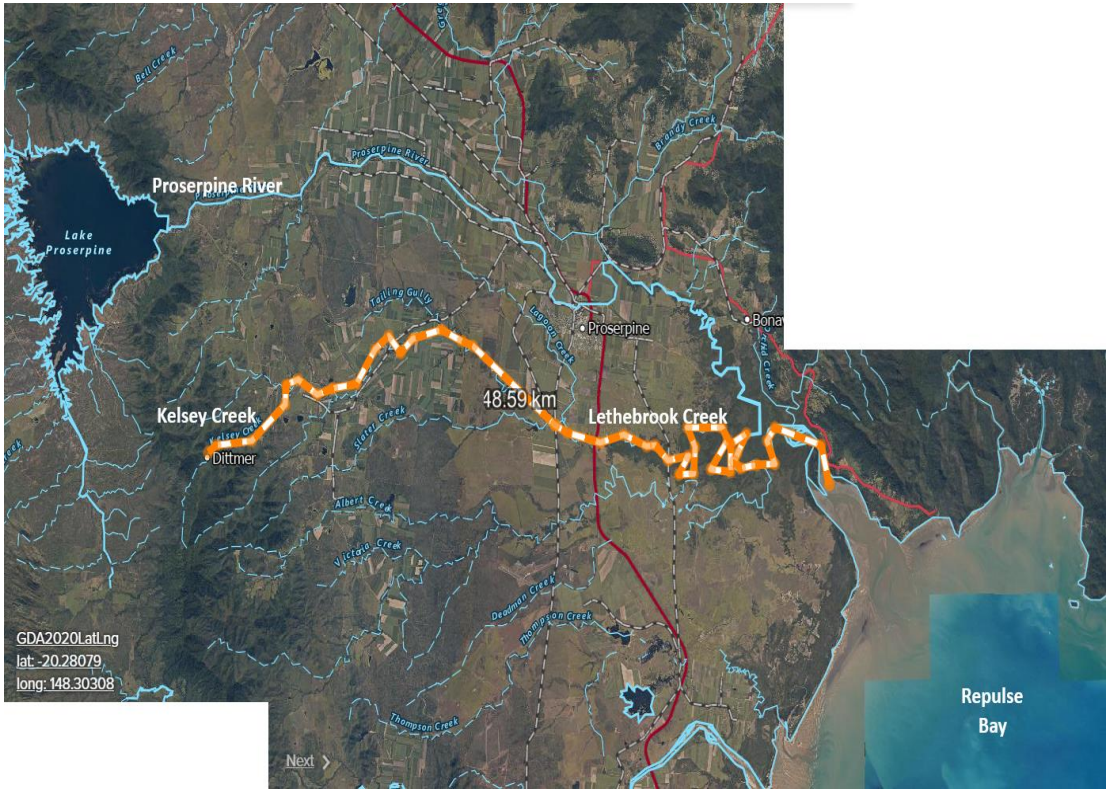

Fig. 15. Approximate distance from Dittmer to the mouth of the Proserpine River is 48.6 km

Despite the presence of these high biodiversity values on site and downstream, Ballymore Resources chose to request a Mineral Development License (MDL 10340 & MDL 10341) and subsequent Environmental Authority (EA) based on a **Standard Type Environmental Resource Activity** (ERA) for a Minerals Resource Activity Permit. This **EA Permit EPSL00460513** was originally effected by the Queensland Department of

Environment and Innovation (DESI), now Department of Environment, Tourism, Science, and Innovation (DETSI), on the19th November 2010. A subsequent amendment to this permit EA was approved on the 8th November 2022.[23] (See also Appendix I)

On its website DESTI states about Environmental Authorities:

> An environmental authority may not be required if your activities meet the criteria for a small-scale mining activity.[24]

Comment: So, what constitutes a small-scale mining activity and does the Dittmer mine project qualify for that designation for its Environmental Authority?

In Queensland, a small-scale mining activity for a Minerals Exploration Permit is defined as a mining activity that meets the following criteria:

> **Exploration permit**: The activity is carried out under an exploration permit for minerals other than coal, and the **area is no more than 4 sub-blocks**
>
> **Comment: EPM 26912 has 58 blocks**.
>
> Within EPM 26912 is EPM 14255. It has 2 sub blocks. Area is 13.964 ha
>
> The Mining Lease Application MLA100351 covers 272 ha (ex ML10341's 13.964 ha.
>
> So MLA100351 and ML 10341 cover an area of **285.964 ha (2.85964 sq. km)**

Comment: As ML 10341 includes 2 blocks and covers 13.964ha, the far larger MLA 100351 of 272ha of 58 blocks could not be considered a Small-Scale Mining Activity, especially in terms of its potential impacts.

*Therefore, why isn't there a new Environmental Authority for MLA 100351 to replace **EPSL00460513**?*

…

[2323] https://apps.des.qld.gov.au/public-register/pages/ea.php?id=103937

[24] https://www.business.qld.gov.au/industries/mining-energy-water/resources/minerals-coal/authorities-permits/applying/authorities/exploration-permit

EPM 14255
REPORT FOR THE PERIOD ENDING

29TH JULY 2010

BY

N. F. STUART

1. INTRODUCTION

Exploration Permit Minerals (EPM) 14255 is located near Dittmer, some 20 kilometres west of Proserpine in north-east Queensland (Figure 1). The topography is quite hilly in many places and is well vegetated. In the lower areas access is reasonable with minor roads and farm tracks, but in the hilly areas access can be limited and difficult.

2. GENERAL GEOLOGY

EPM 14255 is situated on the eastern margin of the Cretaceous Hecate Granite, where it intrudes Late Carboniferous diorites and the Early Permian Carmila Beds. The Carmila Beds consist of a suite of dacites, andesitic pyroclastics and lavas and some sediments. The general geology of the area is shown in Figure 2 and a good summary is contained in the Explanatory Notes for the 1:250,000 Bowen Geological Sheet (Paine and Cameron, 1972) and the earlier report on the sheet area (Clarke, Paine and Jensen 1968).

EPM 14255 is located some 20 km west of Proserpine in north-eastern Queensland and much of it is hilly and well vegetated.

The general geology consists of volcanics and sediments of the Early Permian Carmilla Beds intruded by granitoids of the Cretaceous

Hectate Granite Suite.

Numerous old mine workings (mostly for gold) are scattered throughout the EPM area with the Dittmer mine area being the major "show". Limited modern exploration by companies occurred during the late 1960's up to the late 1980's.

The Dittmer mine area consists of a number of old mines and workings located within the recent M.L. application areas (10340, 10341) shown in figure 2. Locally the main rock types in the Dittmer Mine area are andesitic lavas and pyroclastics. There is some outcropping diorite and dyke rocks are common. The main, auriferous Dittmer Vein occupies a fissure striking NNE and dipping 55 degrees west. At surface the vein can be traced for some 550 metres and ranges in thickness from 0.3m to +/- 2.0m. The vein consists of quartz with gold, pyrite and lesser chalcopyrite. Calcium and iron carbonates are present in some places. The gold is fine grained and associated with the sulphides.

3. MINING AND EXPLORATION HISTORY

Numerous old gold mining prospects are scattered throughout the EPM area (figure 2), but the Dittmer Mine area (and its associated workings) is by far the largest of the old workings. The mine was discovered in 1934 and worked intermittently up until 1970.

From 1935 to 1951 recorded production was 1,696 kg of gold, 728 kg of silver and 300 tonnes of copper. The tonnage mined during this period was 17,400 giving an average gold grade of 97 g/t (about 54,000 ounces). A further 38.97 kg of gold was produced between 1968 and 1970 (average grade of 150 g/t Au). References are available in Paine and Cameron, 1972.

Modern exploration work commenced in 1962 with **CRA Exploration Pty. Ltd.** carrying out stream sediment geochemical sampling in their search for copper deposits.

St. Joseph Phelps Dodge Exploration Pty. Ltd. searched for base metals in the general area under their Authority to Prospect (A to P) 451M in 1967 (Phelps Dodge Pty. Ltd. 1968). In 1969 Carpentaria Exploration Co. Pty. Ltd. explored the general area under A to P 637M. They outlined anomalous areas of copper and molybdenum, but follow-up drilling did not discover anything of economic interest (Carpentaria Exploration Co. Pty. Ltd. 1971). Mines Administration Pty. Ltd. In association with Associated Mining Ltd. explored the area in 1972 (A to P 1022M) and carried out geological mapping, stream sediment sampling, soil geochemical sampling and some percussion drilling (Davies, 1973). However none of the holes intersected significant base metal mineralisation, which was their target. It should be noted that gold was not generally targeted during the exploration of the area during this period.

Buddha Gold mines N.L. (and later in Joint-venture with Homestake Gold Ltd.) explored the area from around 1984 (Kern and Buckland, 1984). They carried out aero-magnetic and radiometric surveys with follow-up ground surveys, rock chip sampling, geochemical sampling in identified anomalous areas, petrographic studies and detailed geological mapping of "areas of interest". In 1987 Cyprus Minerals Australia Co. undertook exploration activities on A to P 4646 (Torrey, 1987). They completed literature reviews, geochemical surveys, rock chip sampling and some drilling.

4. EXPLORATION ACTIVITY DURING PERIOD UNDER REVIEW

Exploration during the period under review was hampered by **an unusually wet season which severely restricted access to most of the tenement area.**

Prospectors were engaged to traverse on foot across the tenement at regular intervals where panning of stream sediments was undertaken in the gullies encountered. Also, the ground traversed was searched for float of gossanous material or other interesting and potentially mineralized rock. Several outcrops of such rock were discovered and samples "dollied" and panned on the spot. Some showed positive results with specks of gold showing in the pan. It is planned to follow up theses locations for further work and precise plotting of locations

when the weather improves.

Field work was also undertaken to explore along strike from known old mine workings. This work showed that extensions to the lode systems occurring in the Carmilla Beds were present and could be traced for some distances. Old workings occurring in the Hecate Granite were also inspected for extensions and positive indications. However in this area the prospects seemed to be limited and further work on them is not recommended. The results of this work are shown on Figure 2.

Inspections were also carried in the areas of the Mining Lease Applications to be sure all was in order.

Drill core from earlier drilling work was located, rehabilitated and prepared for inspection and possible relogging by a geologist.

Discussions were held with several, well funded groups with a view to organizing a farm- out or Joint-Venture agreement on the property. Results of these discussions are pending.

5. REFERENCES

Carpentaria Exploration Co. Pty. Ltd. 1971, "Co. Report on A to P 637" (unpub.)

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Kern R. R, and Buckland R. 1984. "A's to P 2132m, 3285M, (Dittmer), Report for the Six months Ended 5/10/84". Unpub. Co. Rept. to Dept. Mines Qld., Homestake Gold Ltd., CR 14343

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Stuart N. F. 2010 "EPM 14255, Report for the Period Ending 29th July 2009" Unpub. Report to Dept. Employment, Economic Development and Innovation

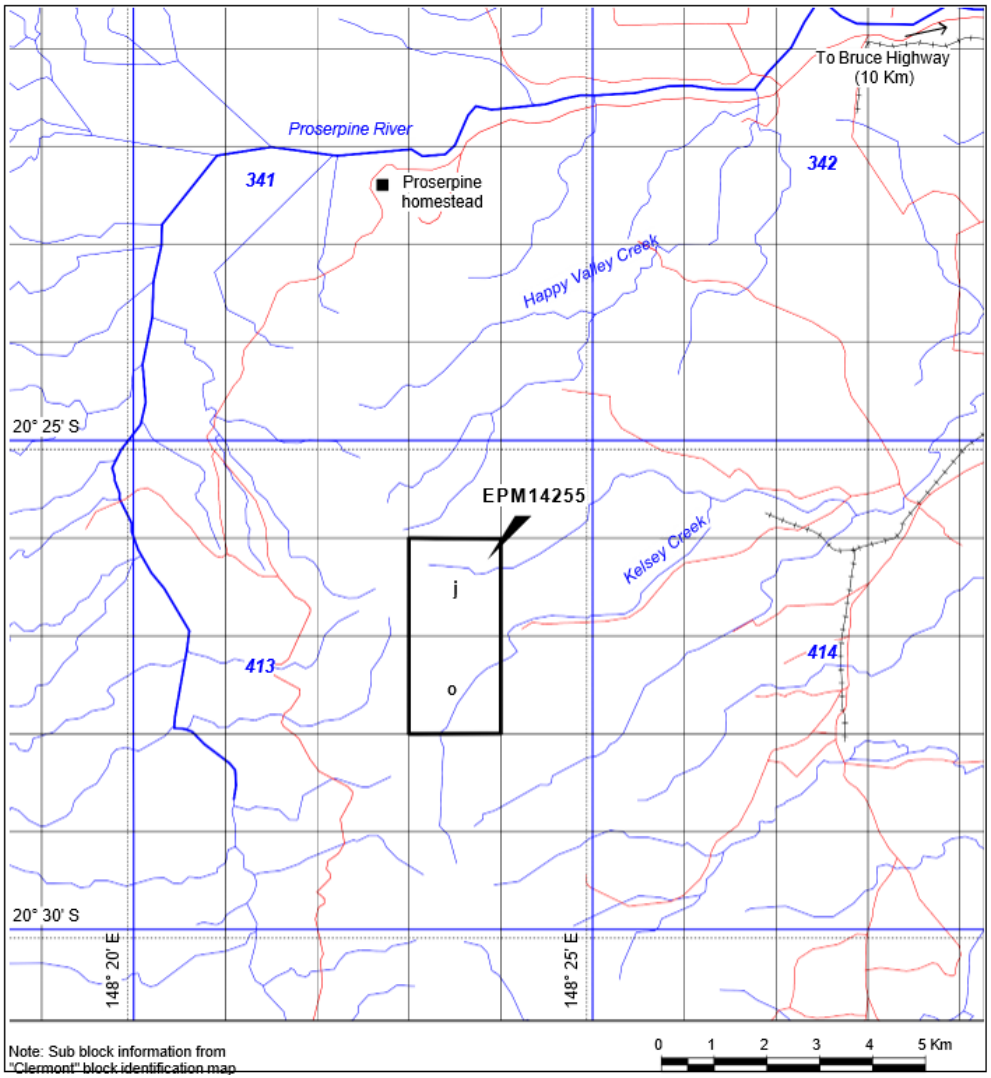


Fig. 16 Location of EPM 14255 in the upper headwaters of Kelsey Creek.

Comment: An Environmental Authority (EA) is not required for a Small Scale Mining Activity so why was one issued for ML 10340 and ML 10341? Was it because they did not meet the definition in the Environmental Protection Act?

Mining activities that meet the definition of small scale mining activities (ESR/2015/1827) (PDF, 184KB) in the *Environmental Protection Act 1994* do not require an environmental authority. These activities however, still need to comply with requirements under the *Mineral Resources Act 1989,* Mineral Resources Regulation and, financial assurance and rehabilitation conditions under schedule 6 of the Environmental Protection Regulation 2019.[25]

They must comply with:

- The Mineral Resources Act 1989 and Mineral Resources Regulation
- Financial assurance and rehabilitation conditions in the Environmental Protection Regulation 2019
- The guidelines and mandatory conditions of the Small-scale mining code
- The general environmental duty of the Environmental Protection Act 1994

Comment: The original Nov 19, 2010 Environmental Authority EPSL00460513 does require compliance with the conditions mentioned above, but there was no requirement for an EA.
What was required was:

EPSL 00460513 which is a code compliant EA that requires the EA holder to comply with all conditions of the **Eligibility Criteria for Mining Lease Projects (ML Code).**[26,27]

Comment: The fact that an EA was required opened the door for the later Mining Lease Application MLA100351 (Fig.) which appears inappropriate because the far larger Dittmer mine expansion does not meet the criteria for a Small Scale Mining Activity in terms of block size. It also does not appear to meet many of the Eligibility Criteria for Mining Lease Projects

[25] https://www.business.qld.gov.au/running-business/environment/licences-permits/applying/activities

[26] https://environment.desi.qld.gov.au/__data/assets/pdf_file/0013/322114/a-ea-amd-100486450-supporting-information.pdf page 3.
[27] https://www.des.qld.gov.au/policies?a=272936:policy_registry/rs-es-mining-lease-projects.pdf

If it does meet the definition of a Large Scale Mining Activity[28] it will need a new EA.

> **Large-scale mining** typically involves long-term projects that proceed from exploration to extraction, and the regulatory regime reflects these stages.
>
> An exploration permit allows a mining company to access a large area to explore for minerals. The environmental impacts at this stage are relatively minor. If minerals are located that cannot be economically recovered, the mining company may apply for a mineral development licence to protect its rights to develop the mineral in the future and to prevent others from applying for a mining lease for the same area. Once the miner believes it is economical to begin mining, an application for a mining lease can be made.
>
> Operating in parallel to the mining tenure and royalty system, the Environmental Protection Act provides a system for assessing and regulating the environmental impacts of mining. Under this Act mining is regulated as an environmentally relevant activity (ERA) and an environmental authority is required.
>
> For a full-scale mining project to occur, a mining lease must be granted under the Mineral Resources Act and an environmental authority must be granted under the Environmental Protection Act.

Comment: So, will the MLA100351's application for an extension of EPSL00460513 be able to comply with the Eligibility Criteria for Mining Lease Projects? Should Ballymore Resources Pty Ltd should be applying to DESTI for a new EA, and not and extension of EPSL00460513 (Fig.17)?

[28] https://queenslandlawhandbook.org.au/the-queensland-law-handbook/living-and-working-in-society/laws-affecting-the-environment/mining/#:~:text=Large%2Dscale%20mining%20typically%20involves,under%20the%20Environmental%20Protection%20Act.

A-EA-AMD-100486450	Ballymore Resources Limited	Non-scheduled mining activity – mining lease	Whitsunday Regional	ML100351 (in application) ML10340 ML10341	5 Sep 2023	Application document (PDF, 115KB) Supporting information (PDF, 722KB)

https://environment.desi.qld.gov.au/management/activities/non-mining/regulation/environmental-authority/current-ea-applications#mineral_applications

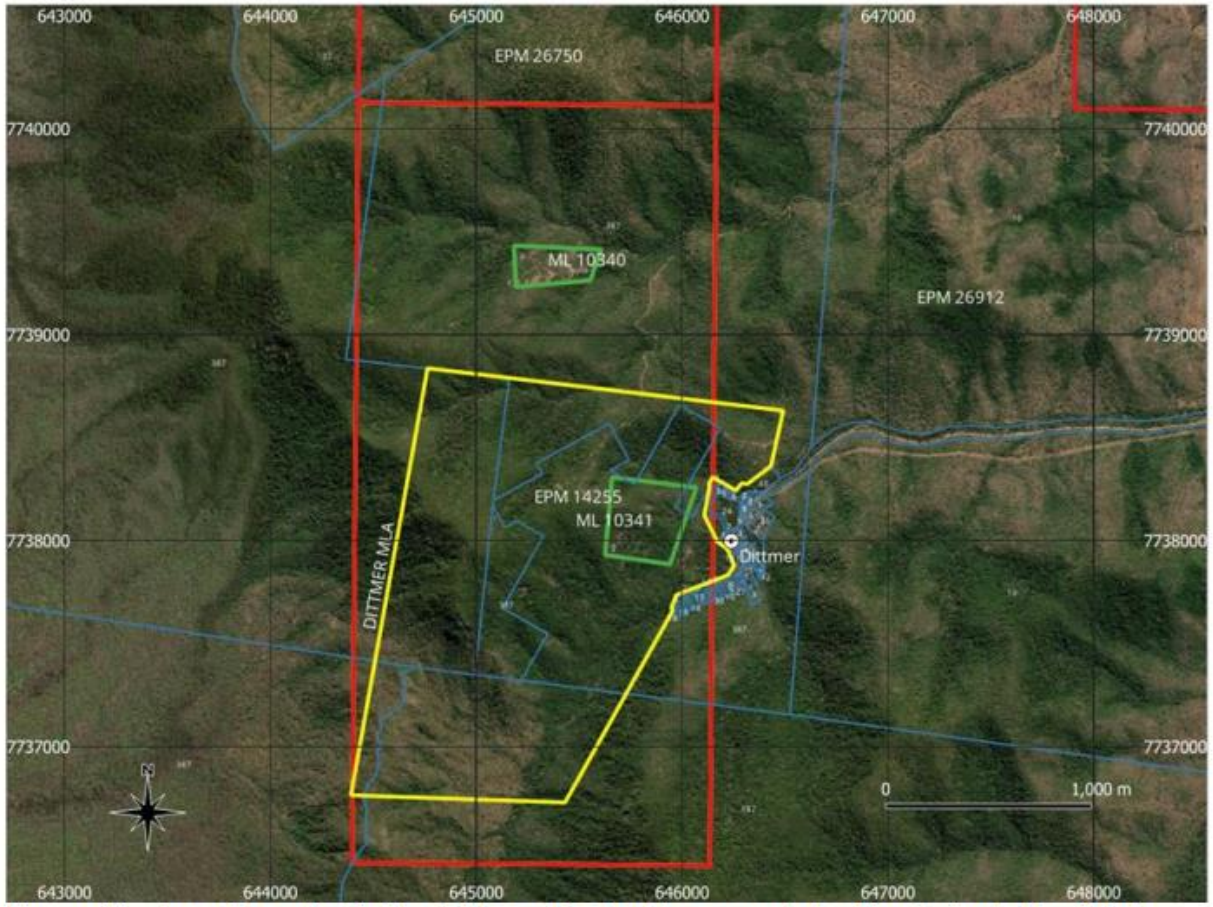


Figure 2 – Location of existing Dittmer Project tenements in Proximity to the MLA

Fig. 17 From supporting information for ML100351 (in application). ML100351 borders are in yellow.

Potential Onsite and Downstream Impacts

The Additional Information Document to Support Application to Amend Environmental Authority Number EPSL00460513[29] stated:

> Additional surface disturbances required for **MLA 100351** are minimal and will not adversely affect Ballymore's ability to comply with the ML Code conditions.

The Dittmer project will involve the extraction of the defined gold resources via traditional underground techniques. The extracted gold ore will be transported via road to an off-site processing facility. As such, the surface footprint and associated environmental impact of the project will be minimal such that the proposed operation can proceed in full compliance with all conditions of the ML Code. Additional surface disturbances required for MLA 100351 are minimal and will not adversely affect Ballymore's ability to comply with the ML Code conditions. Page 3.

Comment: This statement **only addresses surface footprint and associated environmental impacts**. **This would mainly be an underground mine** consisting of tunnels to the north, south and west (total mileage is not provided) under all of the MLA area (Fig. 18).

Specifically, what is not addressed here are any adverse impacts on the surface and underground from the underground mining activities, including any short and long-term downstream impacts on Matters of National and State Significance and any Protected Areas. As these were not required to be addressed in the original Nov 19, 2010 Environmental Authority EPSL00460513, a new EA which does require Ballymore Resources to address all potential impacts is needed.

[29] https://environment.desi.qld.gov.au/__data/assets/pdf_file/0013/322114/a-ea-amd-100486450-supporting-information.pdf Hetherington Exploration and Mining Title Services (QLD) Pty Ltd, for and on behalf of Queensland Zeolite Pty Ltd. 15th August 2023.

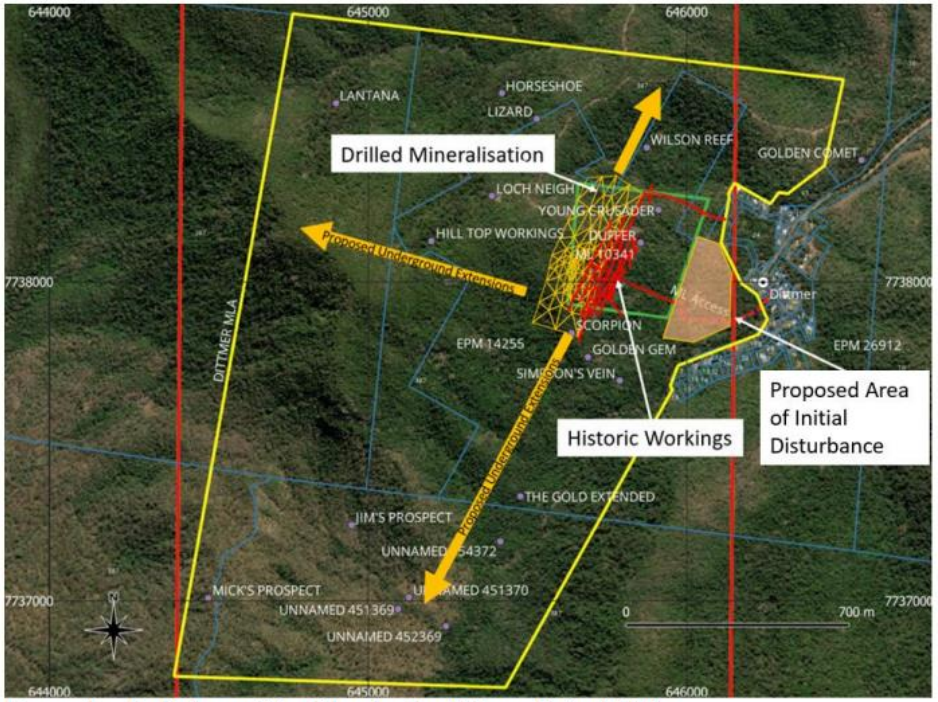


Figure 4 – Preliminary Mine Plan for the Dittmer Project MLA.

Fig. 18 Mining tunnels are planned to the north, south and west of the original Dittmer mine area.

The Dittmer project will involve the extraction of the defined gold resources via traditional underground techniques. The extracted gold ore will be transported via road to an off-site processing facility.
Comment: No location for the off-site processing area or the conditions under which it would operate are supplied. This information is needed to evaluate whether it could cause pollution onsite and/or downstream impacts on MNES or MSES or Protected Areas.

It is understood that the amendment in question is a minor amendment for the following reasons: - - The amendment will not result in any significant additional negative impact on the environmental values of the land in question. The EA holder will comply with current conditions of EPSL00460513 and the ML Code.

No evidence is provided especially on the potential mine tunnel impacts on downstream impacts to show this risk has even been evaluated let alone rated.

2 EA Amendment assessment criteria
… With respect to the proposed amendment application and MLA 100351, an assessment of the likely impact on the environmental values and waste management practices is described below.

It is understood that the amendment in question is a minor amendment for the following reasons:

- **The amendment will not result in any significant additional negative impact on the environmental values of the land in question**.

The EA holder will comply with current conditions of EPSL00460513 and
the ML Code.
The EA holder will comply with all conditions of the current EA.
As such the proposed amendment to the EA will have no significant adverse impact on the current environmental values of the EA.

Comment: It has already been demonstrated that the amended MLA100351 is inadequate.

2 EA Amendment assessment criteria In this case the holder has elected to amend environmental authority EPSL00460513 to include the new mining lease application (MLA 100351).
Ballymore confirms that when conducting the proposed mining activities on ML's 10340, 10341 and MLA 100351 they will comply with all **current conditions of the existing EA**, including **all terms and conditions of the ML Code**.

Comment: It has already been demonstrated that the amended MLA100351 is inadequate.

With respect to the proposed amendment application and MLA 100351, an assessment of the likely impact on the environmental values and waste management practices is described below.

3 Affected environmental values.

3.1 Description of environmental values affected. **Air**

The EA Amendment will not have an adverse impact on the Air Quality. Ballymore will comply with the **conditions relating to existing EPSL00460513 and the ML Code**. Mining activities typically have relatively short-term limited impact in terms of the emissions of particulate matter, odours, and dust.
Modern engines have emission controls in place which limit the emission of contaminants into the environment.
The proposed operations will result in the generation of additional dust. Dust generation will be limited due to the underground extraction techniques used and at this point, there are **no plans for a surface-based crushing unit**.

Some dust generation will occur in the truck loading and road hauling operations; however, this can be easily managed via traditional dust suppression techniques such as ore/haul road watering and covering the haul trucks prior to transport. Given the fact that **only minor additional surface disturbances are proposed as a result of the inclusion of MLA 100351 to the project**, no significant additional adverse impact is expected on the air quality for the project operations.

Comment: There are no details on the dust management plan.

Land and Land Use

The EA Amendment will not have a significant adverse impact on Land Disturbance within the proposed mining area.

Ballymore will comply with relevant conditions of the current EA to minimise disturbance to land and vegetation. This includes the **requirement to limit the maximum area of disturbance at any one time to less than 10Ha**.

Due to the underground extraction technique used for the project, the area of surface disturbance is reduced significantly.

There is no mention of the risk level of surface subsidence impacts caused by the tunnel mining activities. Was this addressed or modelled? Nor mention of the risk of more faulting from mining changes in pressures underground. Faulting could affect the surface environment and its rainfall permeability and any groundwater aquifers as well as near surface water flows.

The grant of MLA 100351 to the project EA will only result in minor additional surface area disturbances to those already required for existing ML's 10340 and 10341. In any event, total surface area disturbances are expected to be below the maximum 10Ha disturbance limit detailed in the ML Code.

Tunnelling can cause changes at the surface that extend well beyond the footprint of the mine tunnels of which no information other than their general directions with MLA 100351 is provided.

There is no requirement for research or discussion on any impacts on the hydrology e.g. surface runoff, sub-surface flows, groundwater recharge and any changes in downstream flows and/or water quality. Given to multiple MNES downstream of this project a risk analysis should be required backed up with real on-site data.[30]

Potential downstream impacts are not addressed.

[30] https://www.des.qld.gov.au/policies?a=272936:policy_registry/era-gl-water-impacts.pdf

Waste

The EA Amendment will not have a significant adverse impact on the existing environmental values due to waste generated by the proposed mining operation. The proposed activities will produce minor quantities of domestic waste, which will be removed from site and disposed of at an approved municipal facility. Ballymore will comply with all conditions of environmental authority to ensure compliance with the relevant waste management conditions of the ML Code with respect to MLA 100351 and the greater project area.

Some minor amounts of waste rock will be produced by the proposed operations; however, it is expected that this waste will be used as backfill in the underground mine voids.

Comment: What toxics are likely to be present within the waste rock? The fill will be more permeable than bordering areas next to the tunnels. So near surface and groundwater flows in these filled voids would act as a conduit to offsite flows including to Kelsey Creek and farther downstream to the coast and offshore GBR. Where is the water Quality Management Plan to ensure monitoring and reporting of such flows and any likely impacts on the many MNES downstream? The Whitsunday water Plan is mainly designed to handle agricultural pollutants than gold mine pollutants and may need updating to be able to deal with mining impacts.

Water / Ground water

The proposed EA Amendment will not have an adverse impact on surface or ground water values. The resource will be removed via standard underground techniques, thereby minimising surface area disturbances. As per the conditions of the ML Code,.

Comment: This does not deal with contaminant flows through the backfill, nor changes in hydrology from the tunnelling including any subsidence and/or faulting in an area known to form faults.

Ballymore will divert all clean stormwater away from the disturbed surface areas and will capture all stormwater runoff from the disturbed surface areas. Ballymore will comply with all conditions of EPSL00460513 to ensure the proposed mining activities result in negligible impact to existing surface water and ground water values.

Comment: In reality this is an area with very high annual rainfall including cyclones and Eastern Lows which bring prolonged multi-day heavy and intense rainfall events so it is quite likely that staff will not be present in such events if the runoff system fails. This system will also need to be designed to handle far above present 1 /100 year high intensity events as climate change proceeds. Also when the mine closes there will be no oversight to ensure negligible impacts on surface and groundwater flows. What will be needed is a control system that can permanently persist given the many downstream MNES and other significant environmental values.

Noise

The EA Amendment will not have an adverse impact on existing noise values within the project area. Ballymore will comply with all relevant conditions of the Eligibility Criteria to ensure noise generated by the activity will not cause environmental harm to any sensitive place or commercial place.

Comment: Legislation and policies for noise control and nuisance applies only to humans not wildlife, yet there are known MNES within the MLA. Noise will be an issue for them especially the Proserpine rock wallaby.

3.2 Details of the emissions on releases likely to be generated

The proposed mining activities are likely to result in the following temporary emission increases: -

• A temporary increase in the generation of dust at the surface disturbance areas which will include the ore loading area. These increases will be temporary while loading operations are being undertaken and will be minimised via the use of appropriate water suppression systems and haul road watering.

Comment: Where will the water be taken from? What impact might that have on the Water Resources Plan for the Proserpine River Basin?

• The proposed mining activity will result in a temporary degradation to the landform and land use of small sections of MLA 100351. Where possible, progressive rehabilitation will be conducted. Upon completion of all mining activities, final rehabilitation works will be completed. Ballymore expects to be able to return all disturbed areas to identical land use and land capability as the pre-disturbance use/capability.

This is highly unlikely given our earlier comments on subsidence and faulting risks. Also, the MLA is covered with remnant regional ecosystems and their biodiversity values will be lost including the loss of tree hollows which can take over 100 years to form. Biodiversity is barely addressed in this EA.

• The activities in question should have a minimal impact of **surface and ground water quality.** Erosion/sediment control structures will be installed as necessary to minimise erosion/runoff in disturbed areas. All clean stormwater will be diverted around disturbed areas and all stormwater runoff from disturbed areas and groundwater from underground operations will be diverted or pumped to settlement ponds or non-referable, nonhazardous waste dams for subsequent use in dust suppression and works or recycled for underground use. Water requirements for the operation will be limited to underground use, and dust suppression activities only which will be obtained from the on-site storage facilities and in accordance with Note 36 of the ML Code.

See earlier comments. Also an ecohydrological study subject to experrt peer review will be needed to justify Ballymore Resources' comments.

• The proposed activities will result in a temporary increase in noise levels at the relevant location while the activities are being completed …

- This does not address noise impacts on threatened MNES wildlife which are present with and near the MLA area. There is no mention of **light pollution** in the MLA area. Is this a mining operation that will not operate at night and have minimal nighttime lighting?

Small-scale mining code[31]

Projects that have a relatively low environmental impact and meet the eligibility criteria for a small-scale mining activity **do not need an environmental authority** and can operate under the Small-scale mining code (PDF, 257KB).[32]

If you already have an environmental authority and meet the criteria, you can apply to surrender your environmental authority when you renew your resource authority, or at any other time.

Miners operating under the code must follow its guidelines and mandatory conditions, as well as comply with the general environmental duty of the *Environmental Protection Act 1994*.

In order to operate under a mining claim or exploration permit without an environmental authority the activity must fall within the definition of 'small scale mining activity' of the EP Act.[33]

According to Schedule 4 of the *Environmental Protection Act 1994* (EP Act), a small-scale mining activity is defined as an activity carried out under: A prospecting permit, A mining claim, and An exploration permit for minerals.

Small-scale mining activities that meet the definition in the EP Act do not require an environmental authority. However, they are **subject to the conditions prescribed in Schedules 6 and 16 of the Environmental Protection Regulation 2019**.

Miners operating under the Small-scale mining code must:

- Follow the code's guidelines and mandatory conditions

[31] https://www.business.qld.gov.au/industries/mining-energy-water/resources/minerals-coal/authorities-permits/applying/fossicking/small-scale-mining
[32] https://www.resources.qld.gov.au/__data/assets/pdf_file/0006/262374/small-scale-mining-code.pdf June 2024 Vers 3.1.
[33] 2 Schedule 4, definition of 'small scale mining activity', EP Act.

- Comply with the general environmental duty of the EP Act

Some examples of mandatory conditions for small-scale mining include:

- Stripping all topsoil and overburden from the area to be excavated
- Keeping the topsoil and overburden in a separate part of the area for rehabilitation

The EP Act protects Queensland's environment while allowing for development that improves quality of life.

- ESR/2015/1827 Environmental requirements for small scale mining ...

  16 Feb 2024 — Environmental requirements for small scale mining activities This information sheet applies to small scale mining activies...

  Queensland Department of Environment and Science
- Small scale mining code - Department of Resources

  * (1) This part provides for the mandatory conditions for the following (each a small scale. mining tenement)— (a) a mining claim...

  Department of Resources
- Small-scale mining code | Business Queensland

  14 June 2024 — Projects that have a relatively low environmental impact and meet the eligibility criteria for a small-scale mining ac...

  Business Queensland

A-EA-AMD-100486450	Ballymore Resources Limited	Non-scheduled mining activity – mining lease	Whitsunday Regional	ML100351 (in application) ML10340 ML10341	5 Sep 2023	Application document (PDF, 115KB) Supporting information (PDF, 722KB)

https://environment.desi.qld.gov.au/management/activities/non-mining/regulation/environmental-authority/current-ea-applications#mineral_applications

ADDITIONAL INFORMATION DOCUMENT TO SUPPORT APPLICATION TO AMEND ENVIRONMENTAL AUTHORITY NUMBER EPSL00460513 AS A STANDARD PERMIT

Tenement MLA 100351 and ML's 10340 and 10341 Environmental Authority number: EPSL00460513 Prepared by: Hetherington Exploration and Mining Title Services (QLD) Pty Ltd, for and on behalf of Queensland Zeolite Pty Ltd Date: 15/08/2023

1 Background

Ballymore Resources Limited (Ballymore) has submitted an application to the Department of Resources (DOR) for the **Dittmer Extended MLA** which is located approximately 20km SW of Proserpine in Queensland. The application was lodged with DOR on 20 July 2023 and was assigned the **reference number MLA 100351**. MLA 100351 together with existing MLs 10340 and 10341 form the greater Dittmer project. Existing ML's 10340and 10341 are currently contained within EPSL 00460513 which is a code compliant EA that requires the EA holder to comply with all conditions of the Eligibility Criteria for Mining Lease Projects (ML Code). Ballymore made application to the Department of Environment and Science to amend the existing EA to add MLA 100351 to it. This document has been prepared to provide necessary information to support the EA amendment application.

Details of permit EPSL00460513

Permit type:	Resource Activity
Industry:	Minerals
Status:	Granted
Condition type:	Standard
Effective date:	19/11/2010
Permit holder(s):	BALLYMORE RESOURCES LIMITED

Activity	Location
Non-Scheduled Mining Activity - Mining Lease (ML)	ML10340: WHITSUNDAY REGIONAL ML10341: WHITSUNDAY REGIONAL

Document title	Date	Document link
EPSL00460513_20221108	08/11/2022	view document (PDF, 0 KB)
EPSL00460513		view document (PDF, 258 KB)

There is also a subsequent application **A-EA-NEW-100515354** for **ERA 33**: Crushing, grinding, milling or screening, milling or screening more than 5,000 tonnes of material a year, and **ERA 54** Mechanical waste reprocessing 1- Operating a facility for receiving and mechanically reprocessing in a year, more than 5,000 t of inert, non-putrescible waste or green waste only. This was granted on the 6th of December 2023 by DESI.

Details of application: A-EA-NEW-100515354

Application Action:	New
Principal Applicant:	STUDFIX PTY. LTD.
Application Status:	Decided
Received Date:	16/10/2023
Related Permit:	P-EA-100518771
Permit Version:	1
Permit Effective Date:	06/12/2023
Permit Status:	Granted

Activity	Location
ERA 33 - Crushing, milling, grinding or screening Crushing, grinding, milling or screening more than 5000t of material in a year	Mobile and temporary within the State of Queensland
ERA 54 - Mechanical waste reprocessing 1 - Operating a facility for receiving and mechanically reprocessing, in a year, more than 5,000t of inert, non-putrescible waste or green waste only	Mobile and temporary within the State of Queensland

ERA standards, which include eligibility criteria and standard conditions, have been developed **for low-risk activities**.

*But under the **Standard Type Environmental Resource Activity** (ERA) for a Minerals Resource Activity Permit application,*

- *no Environmental Impact Statement (EIS) or studies to assess the level of environmental risk from such a project is required,*
- *nor an EPBC Referral on MNES.*
- *No background reports are available to the public.*

Comment: Currently there is no way, other than self-reporting by Ballymore Resources, to know of any toxic pollution from the site or in downstream surface and/or ground waters and impacts on MNES.

Toxic contaminants and potential downstream impacts on significant matters

Toxics pollution prevention of the GBRWHA from mining operations near the GBR coastline appears to be handled by the DESTI assessment process via the Environmental Authorities. So, it is vital that the right type of EA is required.

The pollutants associated with gold mining and possibly critical minerals in the Dittmer mine project are persistent inorganic toxics and their potential to impact this high biodiversity region well into the future should and must be assessed thoroughly.

Toxics from gold mining such as mercury do not break down and bioaccumulate. They are permanently in the landscape downstream and downwind of such mine sources.

Toxic contaminants from metal mining have infiltrated hundreds of thousands of kilometers of river channels around the world, exposing about 23 million people to potentially unsafe levels of lead, zinc, copper, and arsenic[34]. This study did not account for mercury, a common waste product of gold mining, or many of the metals released when mining for battery materials, such as cadmium, chromium, and cobalt. The study also could not account for small-scale mining, which is often dirtier, and not recorded in databases

University of Exeter mining researcher Karen Hudson-Edwards, one of the study leaders, commented that climate change is likely exacerbating the spread of toxic metals. The world is getting windier, says Hudson-Edwards, which means it's more important than ever to control dust at active mines, and to cover tailings storage facilities. Dry conditions caused by more frequent drought speed the formation of metal salts, which dissolve faster when it rains. And increased risk of flooding means more water to move these metals around, contaminating new places, but also potentially diluting toxic metals to safer levels. ***The Proserpine-Goorganga flood plain is a massive area that floods frequently in the Wet season.***

Toxics from gold mining such as mercury do not break down and bioaccumulate.

Mining rare earth elements (REEs) produces 2,000 tons of toxic waste for every ton of rare earth. This waste can contain radioactive materials and heavy metals like uranium, thorium, lead, zinc, and arsenic.[35]

Comment: People, flora and fauna can be exposed to these metals in dusty air, drinking water, and food grown on contaminated land. Most of the land downstream of Dittmer is used for growing sugar cane and is mapped by the state of Queensland as Strategic Cropping Land (Fig. 19) (QGLOBE).

[34] *Science* 2023, DOI: 10.1126/science.adg6704
[35] https://hir.harvard.edu/not-so-green-technology-the-complicated-legacy-of-rare-earth-mining/

Fig. 19 Location of Strategic Cropping Area downstream of the proposed Dittmer gold and copper mine (red outline) within the Kelsey Creek irrigation area.

Regional Interest Areas
The resource activity is:
Not located in an area of regional interest

There are four areas of regional interest. Each area has been identified because of its contribution, or likely contribution, to Queensland's economic, social and environmental prosperity.

- Priority agricultural areas (PAAs)
- Priority living areas (PLAs)
- Strategic environmental areas (SEAs)
- Strategic cropping areas (SCAs)

The project is not directly in an area of regional interest but a substantial section of the downstream area to Repulse Bay is mapped as Strategic cropping areas (SCAs) (green) which mainly produces sugar cane and is part of an irrigation scheme (Fig. 20).

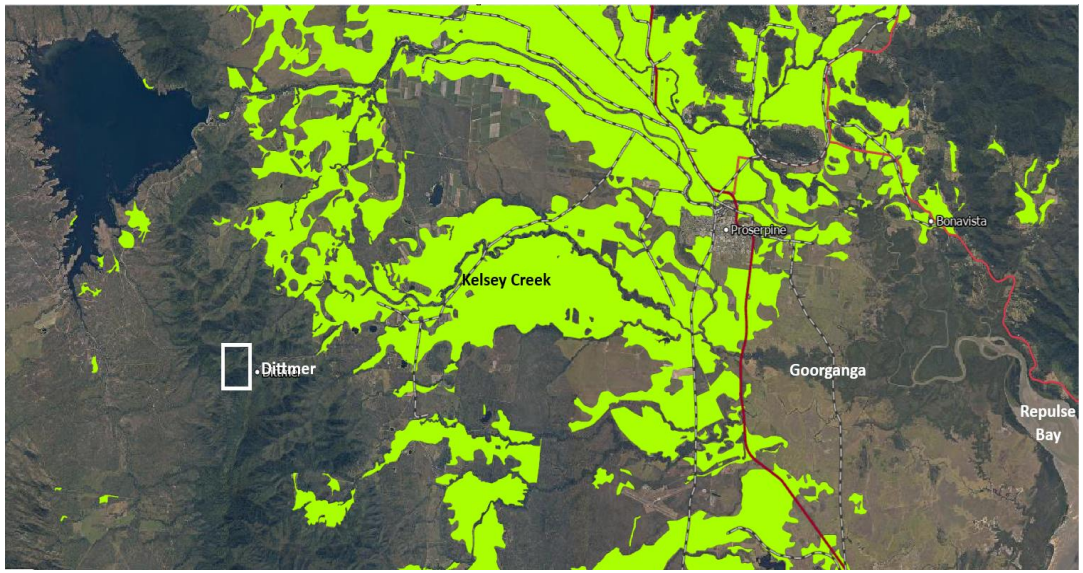


Fig. 20 Area of Regional Interest downstream from the Dittmer mine project

An area of regional interest (ARI) is an area in Queensland that contributes to the state's economic, social, and environmental prosperity. ***The Regional Planning Interests Act (RPI Act) of 2014*** regulates resource activities in ARIs. The RPI Act aims to balance the protection of priority land uses with the economic prosperity of regions.

strategic cropping land means land that is, or is likely to be, highly suitable for cropping because of a combination of the land's soil, climate and landscape features.

This Act provides for a transparent and accountable process for the impact of proposed resource activities and regulated activities on areas of regional interest to be assessed and managed.

Under this Act a person must not carry out, or allow the carrying out of, a resource activity or regulated activity in an area of regional interest unless the person holds, or is acting under, **a regional interests development approval** for the activity.

27 When does a resource activity or regulated activity *impact* an area of regional interest

In this Act, **a resource activity or a regulated activity has an *impact* on an area of regional interest** if the impact—

(a)affects—

(i)a feature, quality, characteristic or other attribute of the area; or

(ii)the suitability of land in the area to be used for a particular purpose; and

(b)relates to a matter mentioned in the following—

(i)for a priority agricultural area—section 8(1)(a);

(ii)for a priority living area—section 9(b);

(iii)for the strategic cropping area—section 10(1);

(iv)for a strategic environmental area—section 11(1)(a).

In Queensland, the Chief Executive can impose an SCL mitigation condition as part of a Regional Interest Development Application (RIDA) for an activity in the Strategic Cropping Area (SCA). The mitigation measures proposed in the RIDA must address how to minimize the impacts of the activity on the SCL

To demonstrate that the activity will not have a permanent impact on the SCL, the land must be restored to its pre-activity condition. This means that the land must be returned to its pre-activity use and productive capacity. Productive capacity refers to the land's ability to store and supply water and nutrients for crops.

The Strategic Cropping Land Act 2011 (SCL Act) allows for certain resource activities that have a temporary impact on SCL or potential SCL to apply for a compliance certificate to operate under a standard conditions code. Under section 81 of the Strategic Cropping Land Act 2011, **this code cannot be used for a resource activity that will have a permanent impact in a protection area**.[36]

[36] https://www.planning.qld.gov.au/__data/assets/pdf_file/0030/76278/SCL-standard-conditions.pdf

Toxics from gold mining such as mercury and other heavy metals such as copper, do not break down and bioaccumulate. So they present a potential threat, especially long-term, to the health of this downstream regional interset area that should be modeled to determine the level of risk especially to any MNES in this region

The Proserpine River sub basin of the Burdekin River Basin is 250,002 ha in area, containing an enormous 2,495 species within the Proserpine River drainage area. And there are 15 bird, 5 mammal, 4 reptile, 4 plant and 1 shark EPBC-listed vulnerable or endangered species known to be within the 48.59 kilometres of waterways downstream of the Dittmer mine project to Repulse Bay, according to the EPBC Protected Matters linear search (20m buffer zone) done on the 14th November 2024 (Table 2).

The large number of shorebirds recorded by the Queensland Wader Studies Group attests to the rich food resources of Repulse Bay and neighbouring Goorganga flood plain wetlands,

Repulse Bay to Ince Bay and Cape Palmerston[37]

Shorebirds along the coastline from Repulse Bay to Ince Bay and Cape Palmerston have been surveyed from 1981, with greater coverage since1995. The surveys, centred around Mackay, include a mostly contiguous stretch of shorebird habitat, with numbers totalling around 20,000 shorebirds.

This section of coastline lies within the Central Queensland Coast Bioregion. The relatively high numbers of shorebirds in this area is possibly a reflection of the high productivity of neighbouring terrestrial ecosystems, together with expansive feeding flats.

Repulse Bay has broad sandflats and scattered mudflats with surrounding seagrass and mangroves, some saltmarsh and saline flats adjoin these intertidal feeding areas. There are rocky intertidal areas south of Repulse Bay around Midge Point down to St Helen's Bay. From St Helen's Bay south there are a series of estuaries and embayments all the way to Cape Palmerston that support shorebirds. There are very wide tidal flats varying from deep mud to coarse sand and well-developed stands of mangroves.

Species

that have a significant presence within the region as a whole include the ruddy turnstone, sooty oystercatcher, lesser sand plover, greater sand plover, sharp-tailed sandpiper, bar-tailed godwit, red-necked stint, grey plover, great knot, common greenshank, grey-tailed tattler, Pacific golden plover and eastern curlew

[37] https://wetlandinfo.des.qld.gov.au/wetlands/ecology/components/biota/fauna/fauna-taxon/birds/shore-bird/migratory-qld/repulse-shoalwater.html

Protection of migratory shorebird waders is the responsibility of the Commonwealth, rather than the states. The implications of the EPBC Act is that we will need in the future a much better knowledge of wader distribution and how they use key sites. The primary objective of the shorebirds 2020 program is to collect robust population data on shorebirds in a manner that can be utilised to aid their conservation and management.[38]

Note that Repulse Bay is a monitoring site for migratory shorebird wader surveys within the East Australasian Flyway.

The Repulse Bay Shorebird Area is approximately 86 kilometres north of the city of Mackay in north Queensland. The shorebird area is centred on the coastline of Repulse Bay and includes the estuaries of the Proserpine and O'Connell rivers, and of the Repulse and Thompson creeks.
The environments in the area are characterised by mangrove-lined estuaries of the rivers and creeks; the estuary entrances and the coastline in between is dominated by extensive intertidal mud and sand flats backed by sandy beaches or mangroves. Marine and estuarine tidal waters flood the bay and intertidal flats and channels, which during wet season events are diluted to brackish levels by freshwater discharge from the streams and the floodplain.

The Proserpine-Goorganga Plain wetland met the National Significance Criteria for thirteen species criteria, and species abundance but not species diversity from a few surveys at four sites (Table 2).

[38] https://awsg.org.au/?s=+survey+sites&Submit=SUBMIT

	Scientific Name	Common Name	Class	Simple Presence	Presence Text	Threatened Category	Migratory Status	Migratory Category	Marine Status	Cetacean Status	Website	Buffer Status
85267	*Sphyrna lewini*	Scalloped Hammerhead	Shark	Known	Species or species habitat known to occur within area	Conservation Dependent					Species Profile and Threat Database (SPRAT)	In buffer area only
856	*Calidris ferruginea*	Curlew Sandpiper	Bird	Known	Species or species habitat known to occur within area	Critically Endangered	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In feature area
847	*Numenius madagascariensis*	Eastern Curlew, Far Eastern Curlew	Bird	Known	Species or species habitat known to occur within area	Critically Endangered	Migratory	Migratory Wetlands Species	Listed		Species Profile and Threat Database (SPRAT)	In feature area
832	*Tringa nebularia*	Common Greenshank, Greenshank	Bird	Known	Species or species habitat known to occur within area	Endangered	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In feature area
64447	*Poephila cincta cincta*	Southern Black-throated Finch	Bird	May	Species or species habitat may occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
1763	*Caretta caretta*	Loggerhead Turtle	Reptile	Known	Species or species habitat known to occur within area	Endangered	Migratory	Migratory Marine Species	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
1767	*Lepidochelys olivacea*	Olive Ridley Turtle, Pacific Ridley Turtle	Reptile	Likely	Breeding likely to occur within area	Endangered	Migratory	Migratory Marine Species	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
1768	*Dermochelys coriacea*	Leatherback Turtle, Leathery Turtle, Luth	Reptile	Likely	Breeding likely to occur within area	Endangered	Migratory	Migratory Marine Species	Listed		Species Profile and Threat	In buffer area only

											Database (SPRAT)	
1060	*Macronectes giganteus*	Southern Giant-Petrel, Southern Giant Petrel	Bird	May	Species or species habitat may occur within area	Endangered	Migratory	Migratory Marine Birds	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
84819	*Solanum graniticum*	Granite Nightshade	Plant	Likely	Species or species habitat likely to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In buffer area only
942	*Erythrotriorchis radiatus*	Red Goshawk	Bird	Likely	Species or species habitat likely to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
331	*Dasyurus hallucatus*	Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu]	Mammal	Known	Species or species habitat known to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
879	*Charadrius mongolus*	Lesser Sand Plover, Mongolian Plover	Bird	Known	Roosting known to occur within area	Endangered	Migratory	Migratory Wetlands Species	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
254	*Petauroides volans*	Greater Glider (southern and central)	Mammal	Known	Species or species habitat known to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
5872	*Phaius australis*	Lesser Swamp-orchid	Plant	May	Species or species habitat may occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
86380	*Limosa lapponica baueri*	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	Bird	Known	Species or species habitat known to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area

36	*Balaenoptera musculus*	Blue Whale	Mammal	May	Species or species habitat may occur within area	Endangered	Migratory	Migratory Marine Species		Cetacean	Species Profile and Threat Database (SPRAT)	In buffer area only
26027	*Neochmia ruficauda ruficauda*	Star Finch (eastern), Star Finch (southern)	Bird	Likely	Species or species habitat likely to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
85104	*Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)*	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Mammal	Known	Species or species habitat known to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
845	*Limosa limosa*	Black-tailed Godwit	Bird	Known	Roosting known to occur within area	Endangered	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In buffer area only
1887	*Taudactylus eungellensis*	Eungella Day Frog	Frog	Likely	Species or species habitat likely to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In buffer area only
77037	*Rostratula australis*	Australian Painted Snipe	Bird	Known	Species or species habitat known to occur within area	Endangered			Listed - overfly marine area (as Rostratula benghalensis (sensu lato))		Species Profile and Threat Database (SPRAT)	In feature area
226	*Petrogale persephone*	Proserpine Rock-wallaby	Mammal	Known	Species or species habitat known to occur within area	Endangered					Species Profile and Threat Database (SPRAT)	In feature area
17533	*Medicosma obovata*	null	Plant	Known	Species or species habitat known to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only

682	*Hirundapus caudacutus*	White-throated Needletail	Bird	Known	Species or species habitat known to occur within area	Vulnerable	Migratory	Migratory Terrestrial Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In feature area
874	*Calidris acuminata*	Sharp-tailed Sandpiper	Bird	Known	Species or species habitat known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed		Species Profile and Threat Database (SPRAT)	In feature area
1766	*Eretmochelys imbricata*	Hawksbill Turtle	Reptile	Known	Foraging, feeding or related behaviour known to occur within area	Vulnerable	Migratory	Migratory Marine Species	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
1765	*Chelonia mydas*	Green Turtle	Reptile	Known	Breeding known to occur within area	Vulnerable	Migratory	Migratory Marine Species	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
64440	*Geophaps scripta scripta*	Squatter Pigeon (southern)	Bird	May	Species or species habitat may occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
59257	*Natator depressus*	Flatback Turtle	Reptile	Known	Breeding known to occur within area	Vulnerable	Migratory	Migratory Marine Species	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
929	*Falco hypoleucos*	Grey Falcon	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
64470	*Carcharodon carcharias*	White Shark, Great White Shark	Shark	Likely	Species or species habitat likely to occur within area	Vulnerable	Migratory	Migratory Marine Species			Species Profile and Threat Database (SPRAT)	In buffer area only

59300	*Xenus cinereus*	Terek Sandpiper	Bird	Known	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In buffer area only
8601	*Graptophyllum ilicifolium*	Holly-leaved Graptophyllum, Mt Blackwood Holly	Plant	Known	Species or species habitat known to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only
86555	*Phlegmariurus tetrastichoides*	Square Tassel Fern	Plant	May	Species or species habitat may occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
60756	*Pristis pristis*	Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish	Shark	May	Species or species habitat may occur within area	Vulnerable	Migratory	Migratory Marine Species			Species Profile and Threat Database (SPRAT)	In buffer area only
855	*Calidris canutus*	Red Knot, Knot	Bird	Known	Species or species habitat known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In buffer area only
29708	*Samadera bidwillii*	Quassia	Plant	May	Species or species habitat may occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only
64586	*Omphalea celata*	null	Plant	Likely	Species or species habitat likely to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
64450	*Pterodroma neglecta neglecta*	Kermadec Petrel (western)	Bird	May	Foraging, feeding or related behaviour may occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only

14159	*Dichanthium setosum*	bluegrass	Plant	Likely	Species or species habitat likely to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
64438	*Fregetta grallaria grallaria*	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only
66	*Xeromys myoides*	Water Mouse, False Water Rat, Yirrkoo	Mammal	Known	Species or species habitat known to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
174	*Macroderma gigas*	Ghost Bat	Mammal	Likely	Species or species habitat likely to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
1193	*Denisonia maculata*	Ornamental Snake	Reptile	May	Species or species habitat may occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
877	*Charadrius leschenaultii*	Greater Sand Plover, Large Sand Plover	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed		Species Profile and Threat Database (SPRAT)	In feature area
82772	*Polianthion minutiflorum*	null	Plant	May	Species or species habitat may occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only
1420	*Egernia rugosa*	Yakka Skink	Reptile	May	Species or species habitat may occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area

872	*Arenaria interpres*	Ruddy Turnstone	Bird	Known	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed		Species Profile and Threat Database (SPRAT)	In buffer area only
843	*Limnodromus semipalmatus*	Asian Dowitcher	Bird	May	Species or species habitat may occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In buffer area only
26048	*Tyto novaehollandiae kimberli*	Masked Owl (northern)	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area
865	*Pluvialis squatarola*	Grey Plover	Bird	Known	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In buffer area only
862	*Calidris tenuirostris*	Great Knot	Bird	Known	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In buffer area only
863	*Gallinago hardwickii*	Latham's Snipe, Japanese Snipe	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area		Species Profile and Threat Database (SPRAT)	In feature area
14319	*Neisosperma kilneri*	null	Plant	Known	Species or species habitat known to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only
16344	*Eucalyptus raveretiana*	Black Ironbox	Plant	Known	Species or species habitat known to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In feature area

66680	*Rhincodon typus*	Whale Shark	Shark	May	Species or species habitat may occur within area	Vulnerable	Migratory	Migratory Marine Species			Species Profile and Threat Database (SPRAT)	In buffer area only
68442	*Pristis zijsron*	Green Sawfish, Dindagubba, Narrowsnout Sawfish	Shark	Likely	Breeding likely to occur within area	Vulnerable	Migratory	Migratory Marine Species			Species Profile and Threat Database (SPRAT)	In buffer area only
186	*Pteropus poliocephalus*	Grey-headed Flying-fox	Mammal	Likely	Foraging, feeding or related behaviour likely to occur within area	Vulnerable					Species Profile and Threat Database (SPRAT)	In buffer area only

Table 2. EPBC Protected Matters linear search (20m buffer zone) from Dittmer Mine Proposal site to Repulse Bay done on the 14th November 2024.

Bird species are the highest number of species present in this Protected Matters Search that are in the known, likely, and may be present categories (Fig.21(a)).

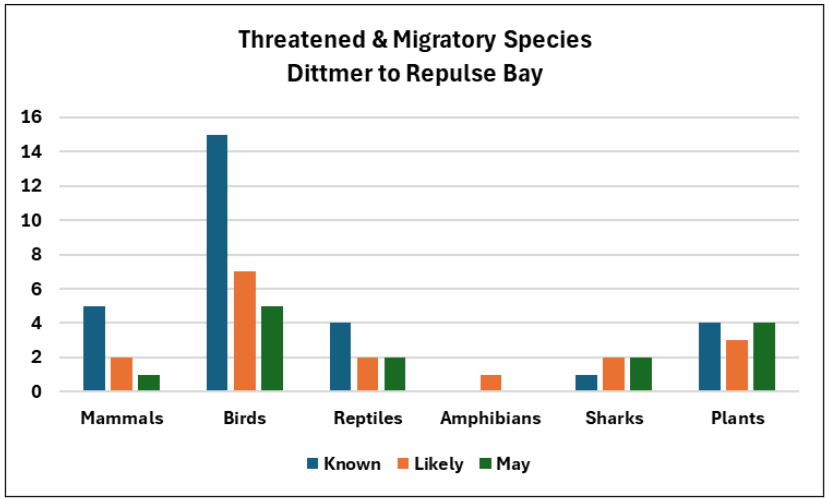


Fig. 21(a) EPBC Protected Matters Search 14th Nov 2024: Dittmer to Repulse Bay (20 m buffer zone)

The majority of known EPBC bird species on record in this Protected Matters search are migratory (Fig. 21(b)).

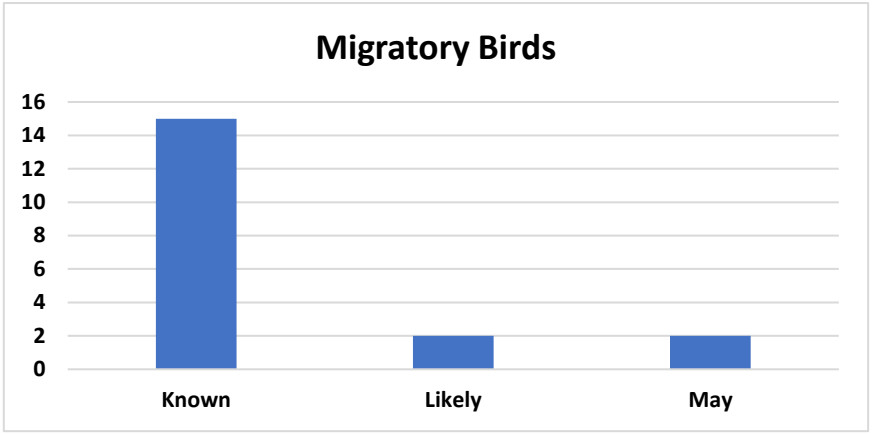


Fig. 21(b) Number of known migratory species dominates

Most of the known threatened wetland species in the PM search are Vulnerable (8), Endangered (3) or Critically Endangered (3).

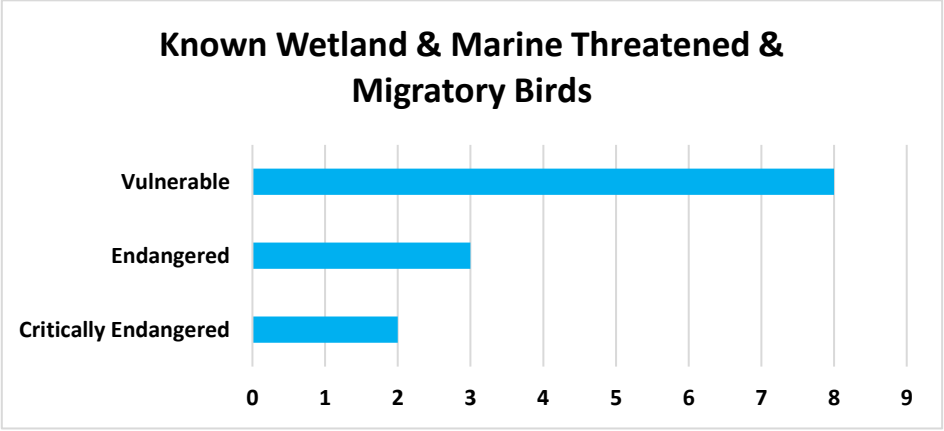


Fig.21(c) Threatened species status of known threatened wetland & marine species in the PM search.

The Proserpine-Goorganga Plain wetland met the National Significance Criteria for thirteen species criteria, and species abundance but not species diversity from up to five Queensland Wader Study Group surveys (Table 3).

National Significance Criteria:

Species Criteria:

Species	Threshold (0.1%)	Max count	Date of max count	Number of surveys meeting threshold	Data source
Great Knot	425	3,962	7/11/2010	5	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Greater Sand Plover	200	760	24/11/2007	2	QWSG, Shorebirds 2020,
Bar-tailed Godwit	325	620	29/01/2006	3	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Lesser Sand Plover	180	594	29/01/2006	3	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Red-necked Stint	475	523	24/11/2007	1	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020

Black-tailed Godwit	160	241	17/11/2012	1	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Whimbrel	65	206	17/11/2012	5	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Eastern Curlew	35	200	7/11/2010	4	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Red Knot	110	150	25/01/2012	1	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Grey Plover	80	143	25/01/2012	1	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Grey-tailed Tattler	70	114	24/11/2007	2	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Terek Sandpiper	50	62	7/11/2010	1	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020
Ruddy Turnstone	30	30	29/01/2006	1	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020

Species Abundance:

Threshold	Max count	Date of max count	Number of surveys meeting threshold	Data source
2,000	5,099	7/11/2010	5	QWSG, Shorebirds 2020, AWSG/Shorebirds 2020

Species Diversity: Not met

References:

Department of the Environment and Energy. 1995. Proserpine-Goorganga Plain, QLD050, *Directory of Important Wetlands in Australia – Information Sheet*, <http://www.environment.gov.au/cgi-bin/wetlands/report.pl>.

Table 3. Wader species present in Repulse Bay from Queensland Wader Study surveys

Altogether, these two tables conform the presence of fifteen migratory shorebirds in Table 2 and a further five in Table 3, so there are at least 20 migratory shorebirds known to utilise the Proserpine-Goorganga plain wetland and the neighbouring shore habitats of Repulse Bay.

There are at least 37 species of migratory shorebirds that use the East Asian-Australasian Flyway, so there are at least 54% of them that we know that visit the Goorganga/Repulse Bay area,

At the very least an EPBC Referral to identify impacts on MNES needs to be required for the Dittmer mine project to ensure the full extent of short and long-term impacts on EPBC-listed species is known and the appropriate monitoring and management plan can be required.

The following information contains a review of the MNES known to be in the site and downstream area. There are probably more as the area has not been comprehensively surveyed for flora and fauna.

There are very few existing gold mines close to the coast in Queensland, so it is very important that the most appropriate assessment of adverse impacts on the biodiversity values of such mining operations so close to the GBRWHA and its river catchments be required.

ENVIRONMENTAL AUTHORITY

All of the three MLs are subject to the Environmental Authority EPSL00460513 Amendment Application.

Environmental Authority Permit – EPSL00460513
Amendment application - A-EA-AMD-100486450
General Information EA Reference: EPSL00460513 EA
Effective Date: 19-Nov-2010
Application Action:
Amend Application Stage: Application
Application Status:Submitted
Submitted Date: 21-Aug-2023
Code of environmental compliance for Mining Lease Projects January 2001

Activities and Locations Details. 049576498576

Activities	Location	Comply with Eligibility Criteria	Comply with Std. Conditions	New or Existing
Non-Scheduled - Mining Activity - Mining Lease (ML)	ML100351	Yes	Yes	New
Non-Scheduled - Mining Activity - Mining Lease (ML)	ML10340	Yes	Yes	Unmodified
Non-Scheduled - Mining Activity - Mining Lease (ML)	ML10341	Yes	Yes	Unmodified

COMMENT: Some of Ballymore Resources replies to this permit application for an Environmental Authority do not appear to agree with the facts. See comments below.

The Applicant was required to complete a 'Standard application form'

Review of Ballymore Resources application for their EA Permit

Environmental Authority Permit – EPSL00460513
Amendment application - A-EA-AMD-100486450
General Information EA Reference: EPSL00460513 EA
Effective Date: 19-Nov-2010
Application Action:
Amend Application Stage: Application
Application Status:Submitted
Submitted Date: 21-Aug-2023
Code of environmental compliance for Mining Lease Projects January 2001

Activities and Locations Details. 049576498576

Activities	Location	Comply with Eligibility Criteria	Comply with Std. Conditions	New or Existing
Non-Scheduled - Mining Activity - Mining Lease (ML)	ML100351	Yes	Yes	New
Non-Scheduled - Mining Activity - Mining Lease (ML)	ML10340	Yes	Yes	Unmodified
Non-Scheduled - Mining Activity - Mining Lease (ML)	ML10341	Yes	Yes	Unmodified

In their Environmental Authority Permit - EPSL00460513 Amendment application - A-EA-AMD-100486450, Ballymore states that the Dittmer Mine expansion is not likely to have a significant impact on MNES within the Mining Leases. There are Proserpine rock wallaby and Northern quoll populations within these MLs. Yet there seem to be no surveys undertaken here to ascertain the number of colonies of the Proserpine rock wallaby or total population of northern quolls. So, there is no way to establish if these are significant populations and what adverse impacts there may be.

QGLOBE maps most of the area as MSES wildlife habitat for endangered or vulnerable species (Fig. 22).

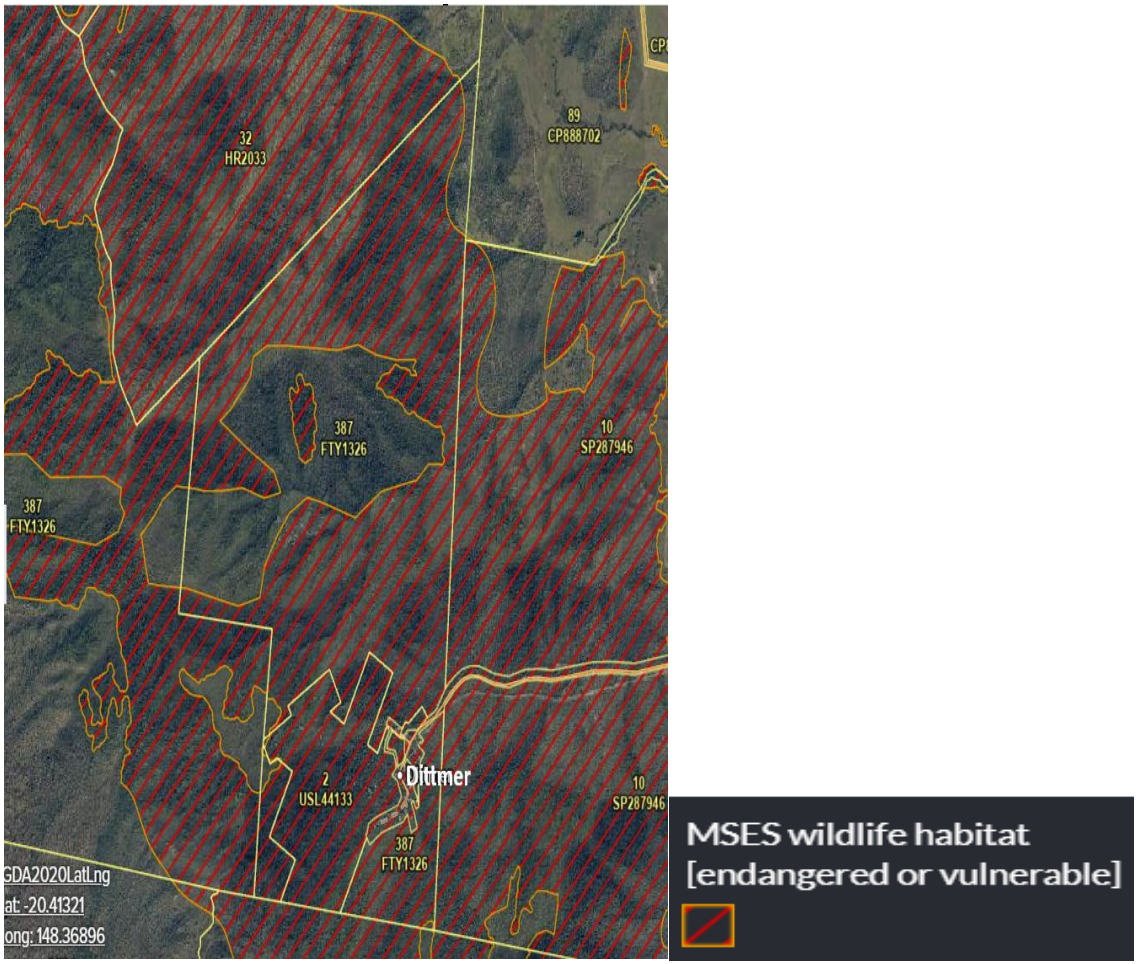


Fig. 22 MSES wildlife habitat for endangered or vulnerable species in and around the proposed Dittmer Mine Project

Ballymore Resources Ltd states in its application for an EA that the project is not likely to have a significant impact on MNES but does not explain why they reached that conclusion.

Matters of National Environmental Significance (MNES)

Carrying out of the proposed ERA (or ERA project):

Is not likely to have a significant impact on MNES.

Ballymore Resources also states that they are not likely to have a significant impact on a prescribed environmental matter above the level of local environmental significance so thus would not need to provide a biodiversity offset. Given the presence of at least two EPBC listed threatened mammal species do they have evidence to support that conclusion?

Environmental Offsets

Will the ERA(s) being applied for cause, or be likely to cause, a significant residual impact to a prescribed environmental matter (other than a matter of local environmental significance)?

No	

There are likely to be environmental offsets for MNES.

Environmental Values (EVs)

The environmental values are:

Uploaded as part of combined supporting document:

Identify the sections or pages where the relevant information is located:	See attachment.

Ballymore Resources attached documents on environmental values of the project area, but they are not posted for the public to review. But the area is mapped as part a larger area of High Ecological Value Water Areas, except for the original mining area in Lot 2USLSP225072 (Fig. 23).

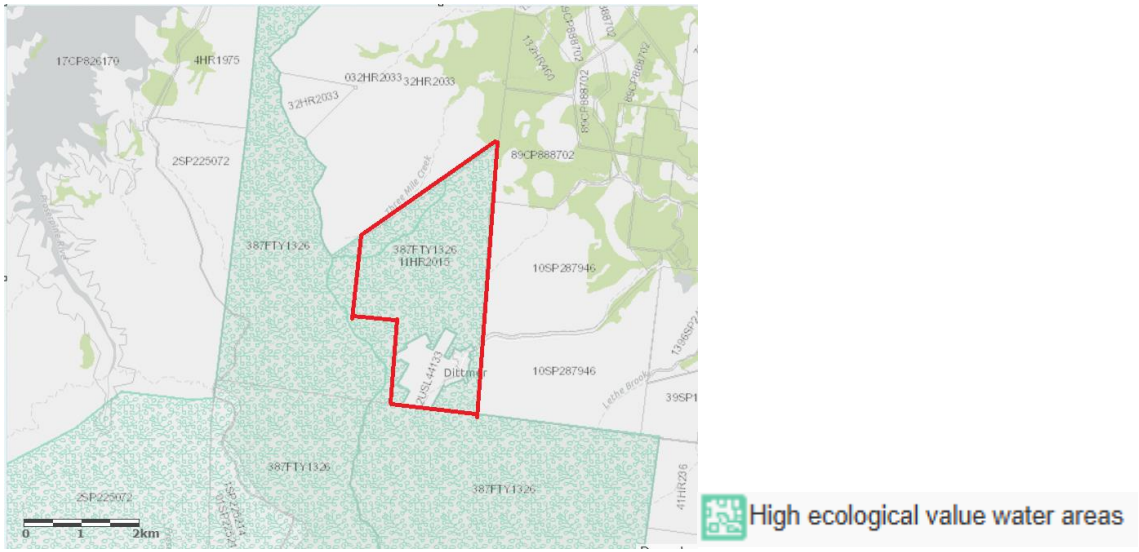


Fig. 23 The Dittmer Mine extended area is part of a large area of High ecological value water area.

The purpose of the **Environmental Protection (Water and Wetland Biodiversity) Policy 2019** (EPP Water and Wetland Biodiversity) is to achieve the object of the *Environmental Protection Act 1994* (EP Act) in relation to waters and wetlands. That is, protecting Queensland's water environment while allowing for development that is ecologically sustainable.[39]

The management intent for waters is stated in section 15 of the EPP Water and Wetland Biodiversity. For waters of high ecological value the water quality is to be maintained. Most of the Dittmer mine project area is classified as High Ecological Value (HEV). The downstream area is classified as Moderately disturbed and the Proserpine- Goorganga DIWA as Slightly disturbed (Fig. 24)

[39] https://environment.desi.qld.gov.au/management/water/policy

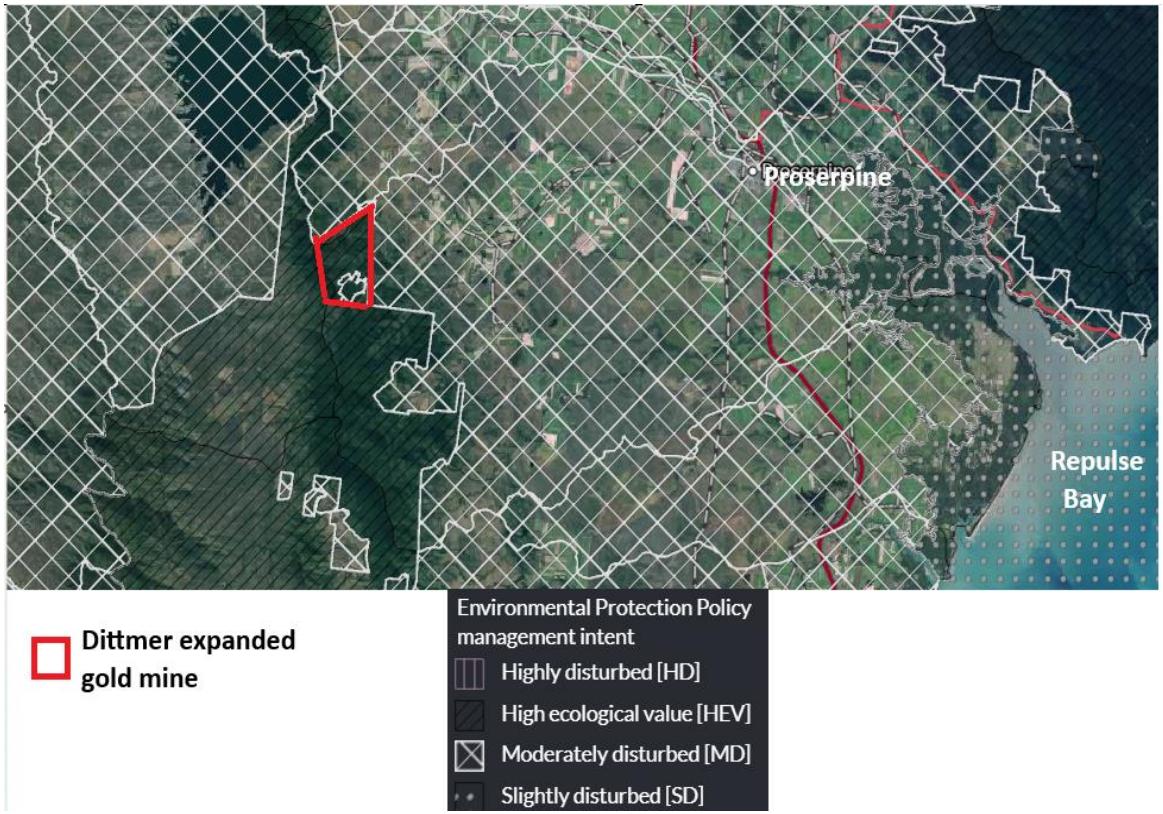


Fig. 24 EPP management intent for the Dittmer project area and the downstream areas.

Comment: How does Ballymore Resources plan to maintain high ecological value for that water area within their mining operations and maintain the EPP management intent on downstream MNES?

Underground Water Rights

Is the activity proposed to be undertaken on a Mineral Development Licence (MDL), Mining Lease (ML) or Petroleum Lease (PL)?

Yes	

Does the proposed amendment involve changes to the exercise of underground water rights?

No	

Underground Water Rights

Is the activity proposed to be undertaken on a Mineral Development Licence (MDL), Mining Lease (ML) or Petroleum Lease (PL)?

Yes	

Does the proposed amendment involve changes to the exercise of underground water rights?

No	

Comment: Why not. Dewatering will be needed.

Guidelines for requirements under the Environmental Protection Act 1994 for site-specific and amendment applications – underground water rights

The primary purpose of this guideline is to assist applicants in understanding the information requirements of sections 126A and 227AA of the ***Environmental Protection Act*** 1994 (EP Act) for site-specific and amendment applications

The level of detail required for each section will depend on the specific characteristics of the project activities and the potential impact to environmental values and groundwater quality. The amount of information provided must be commensurate with the risk of environmental harm and be based on an assessment of the potential impacts of the proposed activities on the environmental values of the project site.

For the purposes of the EP Act, underground water rights mean any of the following:

(a) Underground water rights provided to mineral development licence and mining lease holders in the ***Mineral Resources Act*** 1989;

Underground water rights provide the tenure holder with a statutory right to take or interfere with underground water in the area of the tenure if the taking or interference with that water is necessarily and unavoidably obtained in the process of extracting the resource. For example, mine dewatering to the extent necessary to achieve safe operating conditions. This is also known as associated water. With these underground water rights comes an obligation that tenure holders comply with underground water obligations provided for in Chapter 3 of the Water Act. Sections 126A and 227AA of the EP Act complement Chapter 3 of the Water Act, **by ensuring that an upfront assessment of the impacts to environmental values from the exercise of these underground water rights has been undertaken, and that potential impacts are appropriately managed.**

The amendments introduced by the ***Environmental Protection (Underground Water Management) and Other Legislation Amendment Act 2016*** have introduced new information requirements into the EP Act. Section 126A outlines a list of information requirements which must accompany a site-specific application where the resource activity or project involves the exercise of underground water rights. Section 227AA requires that this information also be included with an amendment application where the proposed amendment involves a change in the exercise of underground water rights.

Comment: Ballymore Resources likely will need to dewatering groundwater and that will likely impact downstream users and MNES and MSES. To what extent is unknown. Where is their Upfront Assessment?

1.1.5 Mandatory requirements

Where the applicant is proposing to exercise underground water rights, a site-specific or amendment application must include the mandatory information outlined in section 126A of the EP Act. Section 126A requires that the applicant must include the following:

- state any proposed exercise of underground water rights during the period in which resource activities will be carried out under the relevant tenure;
- describe the areas in which underground water rights are proposed to be exercised;
- for each aquifer affected, or likely to be affected by the exercise of underground water rights, include—
    - a description of the aquifer;
    - an analysis of the movement of underground water to and from the aquifer, including how the aquifer interacts with other aquifers and surface water;
    - a description of the area of the aquifer where the water level is predicted to decline because of the exercise of underground water rights; and

o the predicted quantities of water to be taken or interfered with because of the exercise of underground water rights during the period in which resource activities are carried out;

• detail the environmental values that will, or may, be affected by the exercise of underground water rights and the nature and extent of the impacts on the environmental values;

• detail any impacts on the quality of groundwater that will, or may, happen because of the exercise of underground water rights during or after the period in which resource activities are carried out; and

• detail strategies for avoiding, mitigating or managing the predicted impacts on the environmental values or predicted impacts on the quality of groundwater.

Comment: Where is the information that Ballymore provided on these mandatory requirements? Does it cover downstream impacts?

1.1.7.1 The requirements of section 126A of the EP Act are complementary with the information requirements for an **Underground Water Impacts Report (UWIR)**[40] under section 376 of the Water Act. It is anticipated that the **information supplied with the EA application** will be utilised and built upon for the applicant's submission of the UWIR. Equally, any relevant information contained in an approved UWIR may be utilised as part of the EA application. However, new information, data or understandings gained between the time of an approved UWIR and submission of the EA application should be reflected in the application material.

Comment: where is Ballymore Resources' UWIR?

[40] https://www.des.qld.gov.au/policies?a=272936:policy_registry/rs-gl-uwir-final-report.pdf

Application Requirement	*Environmental Protection Act 1994*	*Water Act 2000*
A description of the aquifer/s affected or likely to be affected	Section 126A(2)(c)(i)	Section 376(b)(i)
An analysis of the movement of underground water to and from the affected or potentially affected aquifer/s	Section 126A(2)(c)(ii)	Section 376(b)(ii)
A description of the area of the aquifer where the water level is predicted to decline because of the exercise of underground water rights	Section 126A(2)(c)(iii)	Similar to section 376(b)(iv)-(v)

The predicted quantities of water to be taken or interfered with because of the exercise of underground water rights	Section 126A(2)(c)(iv), noting that EP Act requires take for life of the project is required.	Similar to section 376(a)(ii), noting that Water Act only requires 3-year period starting on the consultation day for the report.
Information on predicted impacts to the quality of groundwater that will, or may, happen because of the exercise of underground water rights	Section 126A(2)(e)	Not explicitly required, but will form part of the reporting on impacts to environmental values under section 376(da)-(db)
Information on the environmental values that will, or may, be affected by the exercise of underground water rights	Section 126A(2)(d)	Sections 376(da)-(db)
Information on strategies for avoiding, mitigating or managing the predicted impacts on the environmental values or predicted impacts on the quality of groundwater	Section 126A(2)(f)	Not explicitly required, however note that requirements submitted under section 376(f)-(g), and make good obligations may be utilised as some of the proposed strategies to meet the requirements of section 126A(2)(f) of the EP Act.

Comment: Was this information provided, especially for downstream aquifers? If so, is it available?

An EA may be amended in response to the contents of an UWIR. UWIRs are reviewed annually and are updated on a three-yearly basis. This framework ensures that there is sufficient monitoring, collection and review of information for ongoing adaptive management of groundwater impacts due to the resource sector's statutory right to take underground water.

When site-specific applications are submitted for resource projects and activities that involve the exercise of underground water rights, the application must contain the information that has been outlined in each of the following parts of this guideline: • Part A—A statement that the applicant proposes to exercise underground water rights • Part B—A description of the area/s in which underground water rights are proposed to be exercised • Part C—A description of the aquifer/s affected or likely to be affected • Part D—An analysis of the movement of underground water to and from the aquifer • Part E—A description of the area of the aquifer where the water level is predicted to decline because of the exercise of underground water rights • Part F—The predicted quantities of water to be taken or interfered with because of the exercise of underground water rights • Part G—Information on predicted impacts to the quality of groundwater that will, or may, happen because of the exercise of underground water rights • Part H—Information on the environmental values that will, or may, be affected by the exercise of underground water rights • Part I—Information on strategies for avoiding, mitigating or managing the predicted impacts on the environmental values or predicted impacts on the quality of groundwater.

Applicants should be aware that under Chapter 3 of the Water Act, an UWIR must be submitted prior to the exercise of underground water rights for mining activities.

2.2 Part B—A description of the area/s in which underground water rights are proposed to be exercised Section 126A(2)(b) of the EP Act requires that the applicant must provide a description of the areas in which underground water rights are proposed to be exercised. Maps and tables showing the area where underground water rights are proposed to be exercised should be provided including, where possible, details of project staging. The exact locations (i.e. spatial coordinates) of where resource activities will be undertaken within the relevant tenure is not required, where this information is not known at the time of application. However, a general description of the area should be provided in the absence of exact locations.

2.3 Part C—A description of the aquifer/s affected or likely to be affected Section 126A(2)(c)(i) of the EP Act requires that the applicant must identify and describe the aquifer or aquifers that are going to be affected or likely to be affected by the exercise of underground water rights.

Section 376(b)(i) of the Water Act also requires this information to be provided by an applicant when preparing an UWIR. The department anticipates that applicants will use this information for both purposes.

All aquifers that occur within or outside of the tenure and are going to be affected or likely to be affected, must be described. These descriptions should be based on accepted aquifer nomenclature.

Descriptions of aquifers should include:

- aquifer type (confined, unconfined, fractured etc.)
- geology/stratigraphy (such as alluvium, volcanic, metamorphic) for each aquifer • depth to and thickness of the aquifers
- a description of the physical integrity of the aquifer, fluvial processes and morphology of groundwater resources

- depth to water level and seasonal changes in levels

To assist in describing the aquifers, hydrogeological cross sections should also be included to show:

- affected or potentially affected aquifers;
- the elevations and relative positions of each of these aquifers;
- the location of water bores screened within these aquifers (if known);
- **the location of any significant faults that intersect each potentially affected aquifer**; and
- available data on current underground water levels.

Multiple cross sections should be included if the above points above are unable to be included in a single cross section due to scale or complexity. Maps should also be provided to show the physical extent of each of the affected or potentially affected aquifers. This should be accompanied by a description of the methodology used to determine aquifer extent, for example, the data used and the interpolation methods used. Ultimately, the assessment of whether aquifers are likely to be affected should be based on predicted drawdown (that is, from underground water modelling) which is discussed in Part E.

2.4 Part D—An analysis of the movement of underground water to and from the affected or potentially affected aquifer/s

Section 126A(2)(c)(ii) of the EP Act requires that the applicant must include for each aquifer predicted to be affected or likely to be affected, an analysis of the movement of underground water to and from the aquifer, including how the aquifer interacts with other aquifers and surface water. This requirement is largely similar to section 376(b)(ii) of the Water Act. The department anticipates that applicants will use this information for both purposes. The scope of this information should include at least the following:

2.4.1 Inputs Inputs (e.g. recharge from rainfall or other aquifers) to and outputs (e.g. discharge to springs, baseflow to watercourses and extraction from water bores) from potentially affected aquifers should then be described and estimated based on available data. Information on the location of water bores can be acquired by requesting a search of the Groundwater Database - Queensland. For further details refer to the Queensland Government Open Data Portal at www.data.qld.gov.au.

2.4.2 Underground water elevations To analyse the movement of underground water in aquifers, contours of underground water elevations should first be produced to determine general underground water flow directions.

2.4.3 Connectivity To assess the connectivity between aquifers, information is needed about the aquifer/s (and aquitard) hydraulic properties. In addition to any available pumping test data and drill stem test data, stratigraphic information can be combined with a literature review to estimate hydraulic properties

for the aquifers of interest (Hackbarth, 1978). Where no pumping test data or drill stem test data is available, pumping tests should be conducted to determine aquifer hydraulic properties. In addition to hydraulic property information, other approaches are available for assessing interactions between aquifers. By comparing pressure heads, underground water hydrographs and/or underground water chemical composition (e.g. electrical conductivity, major ion chemistry and environmental tracers) between the aquifers of interest, assessments can be made about the connectivity between these aquifers. These approaches should be considered before conclusions are drawn about connectivity between aquifers.

2.4.4 Preferential flow paths Consideration should also be given to natural and anthropogenic preferential flow paths such as **faults** and abandoned water bores, petroleum wells and coal exploration bores. An assessment of the connectivity between the aquifers affected or potentially affected with surface water is also required. To analyse aquifer interaction with surface water systems, an important consideration is any potential connectivity between the aquifer(s) and any overlying spring or surface water system. Several methods are available to make assessments about "source aquifers" i.e. determinations of the aquifers that are hydraulically connected to springs (EHA, 2009). These methods include assessments of hydrogeology, hydrology and hydrochemistry. Multiple methods should be employed as the application of a single method is unlikely to result in an unequivocal attribution of spring discharge to a source aquifer (EHA, 2009).

2.4.5 Springs Hydrogeological assessments aim to gather information about possible source aquifers. Spring locations should be compared with geological and hydrogeological maps (noting the occurrence of springs within outcrop areas of specific formations). Information about subsurface geometry of aquifers should also be provided to identify physical pathways by which water can travel through aquifer(s) to a spring. Hydrological assessments involve investigations of spring discharge. The temporal pattern of underground water discharge from springs should be examined in relation to temporal changes in underground water levels (and extraction) in underlying aquifers. Comparisons should also be made between spring discharge surface elevations and potentiometric surface values for underlying aquifers. A spring can only discharge at a site where the potentiometric surface of its source aquifer is at or above the ground surface (EHA, 2009).

…

2.8 Part H—Information on the environmental values that will, or may, be affected by the exercise of underground water rights Section 126A(2)(d) of the EP Act requires that the applicant must provide information on the environmental values that will, or may, be affected by the exercise of underground water rights as well as including detail of the nature and extent of those predicted impacts to environmental values. When identifying and describing environmental values, any gaps in knowledge should be clearly stated. Applicants should also note that the department expects that this information will be built upon and reported against through the UWIR prepared under the Water Act. Section 376(1A)(da)-(db) will require that a tenure holder preparing an UWIR, include a description of the impacts on environmental values that have occurred, or are likely to occur, because of any previous exercise of underground water rights as well as to predict impacts into the future both in the short-term and life of the project.

Groundwater dependent ecosystems (GDEs) are ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services.

Ecosystem dependency on groundwater may vary temporally (over time) and spatially (depending on its location in the landscape). GDEs include aquifers, caves, lakes, palustrine wetlands, lacustrine wetlands, rivers and vegetation. Additional information on GDEs including details of the Queensland GDE mapping method, conceptual models and mapping products are available on the WetlandInfo website at http://wetlandinfo.des.qld.gov.au/wetlands/.

The section 7 of the Water EPP sets the environmental values of wetlands as: • the health of the wetland's ecosystems • the wetland's natural state and biological integrity • the presence of distinct or unique features, plants or animals and their habitats, including threatened wildlife and near threatened wildlife under the Nature Conservation Act 1992 • the wetland's natural hydrological cycle • the natural interaction of the wetland with other ecosystems, including other wetlands. For further guidance on the identification and description of GDEs, it is recommended that the applicant refer to the EIS information guideline—Groundwater dependent ecosystems (Department of Environment and Science, 2016). Further guidance for aquatic ecological values is also provided in the EIS information guideline—Aquatic ecology (Department of Environment and Science, 2016).

To describe each environmental value further, it is recommended that, where impacts are predicted, the following is described in the context of potential impacts from groundwater level changes: • source aquifer (noting that this will link to the description of affected aquifers in Parts C and D); • likely relationship between the value and source aquifer (including hydrogeological and ecological conceptualisations); • an estimation of the water requirements (e.g. supply for users or ecological water requirements for GDEs); • availability of the water, including both quality and quantity to meet water requirements of the environmental value; • sensitivity of the environmental value to a change in water quality and quantity resulting from decline in groundwater levels; and; • any knowledge gaps or uncertainties and any assumptions used to address these.

2.8.2 Nature and extent of the impacts on the environmental values Once the values have been identified and described, the application must also include a description of the nature and extent of the impacts on the environmental values due to the exercise of underground water rights.

The applicant is only required to undertake this analysis for environmental values that have been identified as being, or potentially being, impacted due to the exercise of underground water rights.

The modelling used to predict water level decline, should be utilised to inform the analysis of impacts to the identified environmental values. It is also recommended that the information on changes to groundwater quality (Part G above) would also be included in assessing impacts to environmental values.

Correct and comprehensive identification of the potential impacts on environmental values is crucial for an efficient assessment of the application.

Information requests are most frequently issued on applications where this has not been done correctly and may result in delays in the assessment of the application.

The potential impact on environmental values may extend beyond the project area to surrounding areas and include potential regional and cumulative impacts.

Assessment of the adverse impacts on environmental values, should for each value, include an assessment of the following aspects:

• the magnitude, relative size or actual extent of any impact in relation to the environmental value being affected by groundwater level changes, particularly a decline in water level (i.e. the information described in Part E and F);

• the vulnerability or resilience of the environmental value to the predicted impacts considering:

o the severity of any adverse effect ; and

o the duration of the effect, for example the impact may be seasonal, or it may end with the activity or extend beyond the cessation of the activity;

• an indication of the level of uncertainty of impacts and any assumptions used to address the uncertainty in any of the data or proposed commitments to protect the environmental values.

It is anticipated that to assess the nature and extent of predicted impacts on environmental values **a risk assessment will be required**. This will incorporate predictions of impact from the groundwater model, the estimated water requirements of all relevant environmental values, and the sensitivity of these environmental values to a change in water level. This will provide a focus for the monitoring strategy and areas of future research.

Comment: Was a risk assessment done. If so, does the public have access to it?

In determining the potential impact of the activities, research, investigations, surveys, modelling and monitoring may be required. The raw data associated with this work is commonly required as part of the assessment process and should be submitted as part of the EA application. For GDEs, the impact of changes in groundwater quantity and quality is determined by the degree and nature of their groundwater dependency. Applicants should refer to the **EIS guideline—Groundwater dependent ecosystems (Department of Environment and Science, 2016)** for more information.

Comment: No EIS was required for this project. It was classified by DESI as low risk. This again demonstrates that the original EA is not applicable to the much larger Dittmer mine project.

The definition of waters includes the bed and banks of waters, so assessments also need to consider the nature and extent of impacts on aquatic flora and fauna, including benthos and riparian vegetation.

2.9 Part I—Information on strategies for avoiding, mitigating or managing the predicted impacts on the environmental values or predicted impacts on the quality of groundwater

Section 126A(2)(f) of the EP Act requires that the applicant must provide information on strategies for avoiding, mitigating and managing the predicted impacts on both environmental values and predicted changes in groundwater quality **The applicant will be required to develop and implement a water monitoring strategy and a spring impact management strategy, as part of an UWIR prepared under the Water Act.**

Comment: was this required and provided?

The department recommends that the applicant consult the Underground water impact report and final reports guideline (ESR/2016/20003) to ensure that the strategies included in the application (i.e. to meet the requirement of section 126A(2)(f) of the EP Act) complement these requirements of the UWIR.

The administering authority must be satisfied that all reasonable steps and strategies are in place to minimise the predicted impact to environmental values and groundwater quality.

In determining whether the strategies are reasonable, the administering authority will consider the following factors: • the nature of the harm or potential environmental harm to environmental values • the sensitivity of the receiving environment • the current state of technical knowledge for the activity • the current state of technical knowledge of the environmental values • the likelihood of successful application of strategies to minimise the adverse effects.

The strategies should be based on practical options and be derived from site specific environmental assessments, environmental best practice and proven research and/or justification in science, legislation, guidelines, etc.

Where **knowledge gap**s are identified or there is a level of uncertainty in any of the data, the knowledge gaps, uncertainty and any assumptions used to address these should be clearly stated to allow the administering authority to consider the adequacy of the assessment in the context of existing knowledge. Considerable assessment effort is often required to assess applications that include unsubstantiated environmental protection commitments, which can result in significant delays in finalising the assessment of applications. In proposing measures to protect groundwater, the **Guidelines for Groundwater Quality Protection in Australia (Australian Government, 2013**) should be referenced. Indigenous heritage values should be managed according to the requirements of the Queensland Heritage Act 1992, Aboriginal Cultural Heritage Act 2003 or Torres Strait Islander Cultural Heritage Act 2003 and do not need to be detailed in the application documents.

Strategies for avoiding, mitigating and managing the predicted impacts on both environmental values and predicted changes in groundwater quality should include: • objectives which define the outcomes that are intended to be achieved (i.e. avoiding, mitigating and managing the predicted impacts) and a description of unavoidable impacts to environmental values • measures (specific methods/procedures/tools) to be implemented to demonstrate how the objectives will be achieved • indicators relevant to protection of the environmental values (i.e. indicators are the values that are to be measured to gauge whether the objectives are being achieved and are used to are to be used in auditing the performance of measures) • a program for monitoring the indicators • a reporting program which includes triggers for the review of the strategies, and identifies additional data, assessment, analysis and reporting requirements.

Appropriate indicators, standards and control strategies can be determined from existing legislation, regulations, federal, state and local government policy, EPPs, model conditions, results of environmental impact assessment, results from research, investigations, surveys, monitoring, modelling, community consultation, technical guidelines and any other guidelines including those from international agencies.

Harm to environmental values generally implies some adverse change in environmental condition. In relation to underground water, the degree of change accepted before harm is considered to have occurred is generally governed by changes to the water quality objectives. These may include physical, chemical, radiological and biological objectives as well as narrative statements on environmental condition.

The degree of change acceptable in environmental condition for human use environmental values such as drinking, stock water, aquaculture and irrigation is limited to that which does not affect suitability for those uses.

It is noted that the applicant will likely be able to use the obligations under Chapter 3 of the Water Act, including the statutory requirement to 'make good' impacts to water bores, as a management strategy for the predicted impacts on human use values.

For ecological environmental values, a specified acceptable degree of departure from a reference condition is generally used for ecological stressors and biological indicators, and in respect of toxic substances, guidance based on relevant aquatic toxicity studies.

The degree of departure from natural condition and level of ecosystem protection afforded from **toxic substances** is based on the level of ecosystem protection prescribed for the relevant waters.

Under the **Water EPP**, there are four levels of ecosystem protection, namely high ecological value, slightly disturbed, moderately disturbed and highly disturbed.

Guidance on how water quality objectives are applied in each case is described in **the Queensland Water Quality Guidelines 2009 (Department of Environment and Science, 2013).** These guidelines provide water quality objectives for various water types for Queensland regions/sub regions.

Where waters are listed under Schedule 1 of the Water EPP, the Water EPP scheduling documents provide environmental values and water quality objectives. The Australian Water Quality Guidelines (ANZECC and ARMCANZ, 2000), the Australian Drinking Water Guidelines (National Health and Medical Research Council, 2011) and the Guidelines for Managing Risks in Recreational Water (National Health and Medical Research Council, 2008) are also relevant and should be consulted

The monitoring program should:

• track changes against pre development conditions by collecting sufficient data to assess background/baseline conditions, seasonal variations and recharge/discharge behaviours;

• to an appropriate extent, extend monitoring beyond the predicted impact areas to confirm that impacts are not occurring beyond these areas;

• supplement existing monitoring programs to fill any critical gaps in data;

o include a rationale that includes (but is not restricted to):

o a methodology for the number, location and placement of monitoring sites for each indicator and standard to be monitored;

o an explanation about how it will improve the understanding about the impacts of underground water extraction on identified environmental values and water quality; and

o maps to demonstrate the purpose and location of monitoring points including coordinates details;

• include monitoring bores constructed in accordance with the minimum construction requirements; • include drilling logs and construction details of all monitoring bores and where vibrating wire piezometers are installed, depths and construction details of each piezometer should be provided;

• Methods of groundwater sampling should comply with the latest edition of the **Queensland Monitoring and Sampling Manual (Department of Environment and Science, 2010), AS/NZS 5667:11** 1998 Water Sampling Guidelines—Part 11: Guidance on sampling groundwater (Technical Committee EV/8, 1998), and

the Australian Government's Groundwater Sampling and Analysis—A Field Guide (Sundaram, et al., 2009) as relevant and as may change from time to time;

• manage water quality monitoring in accordance with the relevant National Water Quality Management Strategy (NWQMS) guideline: Australian Guidelines for Water Quality Monitoring and Reporting (AWQG) (ANZECC and ARMCANZ, 2000);

• **manage stygofauna sampling** in accordance with the Department of Science, Information Technology and Innovation's guideline for the Environmental Assessment of Subterranean Aquatic Fauna (Department of Science, Information Technology and Innovation, 2015); and

• provide a description and supporting rationale of any alternative or additional monitoring methodologies.[41]

Comment: the above section shows the intent of DESTI is to require sufficient information to try to ensure sustainable development. But much of this may not have been required of Ballymore resources because the full extent of the possible adverse long term impacts on MNES was not understood.

[41] https://www.desi.qld.gov.au/policies?a=272936:policy_registry/rs-gl-requirements-underground-water-rights.pdf
Guideline Environmental Protection Act 1994 Requirements for site-specific and amendment applications— underground water rights

DESTI appears to be relying on Ballymore Resources to self-assess and report problems because they approved the Standard Assessment approach for an assumed low impact project in a vulnerable location.

In addition, of the ten major terrestrial and marine ecosystems in Australia most vulnerable to climate change tipping points, in which modest environmental changes can cause disproportionally large changes in ecosystem properties, the Dittmer project and downstream areas potentially could contain six.[42]

1. **Elevation restricted mountain ecosystems**
2. **Coastal floodplains and wetlands**
3. **Coral reefs,**
4. **Drier rainforests**
5. **Offshore islands**
6. **Salt marshes and mangroves**

Dittmer Mine History and Exploration

The Dittmer Mine was once one of Australia's highest-grade gold mines, but the original mine workings stopped in the 1950s

Ballymore completed a series of drilling programs at the Dittmer Gold Project, including a 19-hole Stage 3 drill program that covered over 3,000 meters. The drilling confirmed the extension of the historic Duffer Lode, with assay results showing significant gold mineralization. The company also identified high-grade mineral within 20 meters of existing underground access.

Exploration activities conducted on ML 10340, ML 10341 and MLA 100351 to date have defined a resource expected to contain approximately **300,000 tonnes of gold, copper, and silver bearing ore.**

The locations of copper and gold resources in the Dittmer mine project are in (Fig. 25).

[42] Karen J. Vella et al. 2013.The ten Australian ecosystems most vulnerable to tipping points" [Biol. Conserv. 144 (2011) 1472–1480]

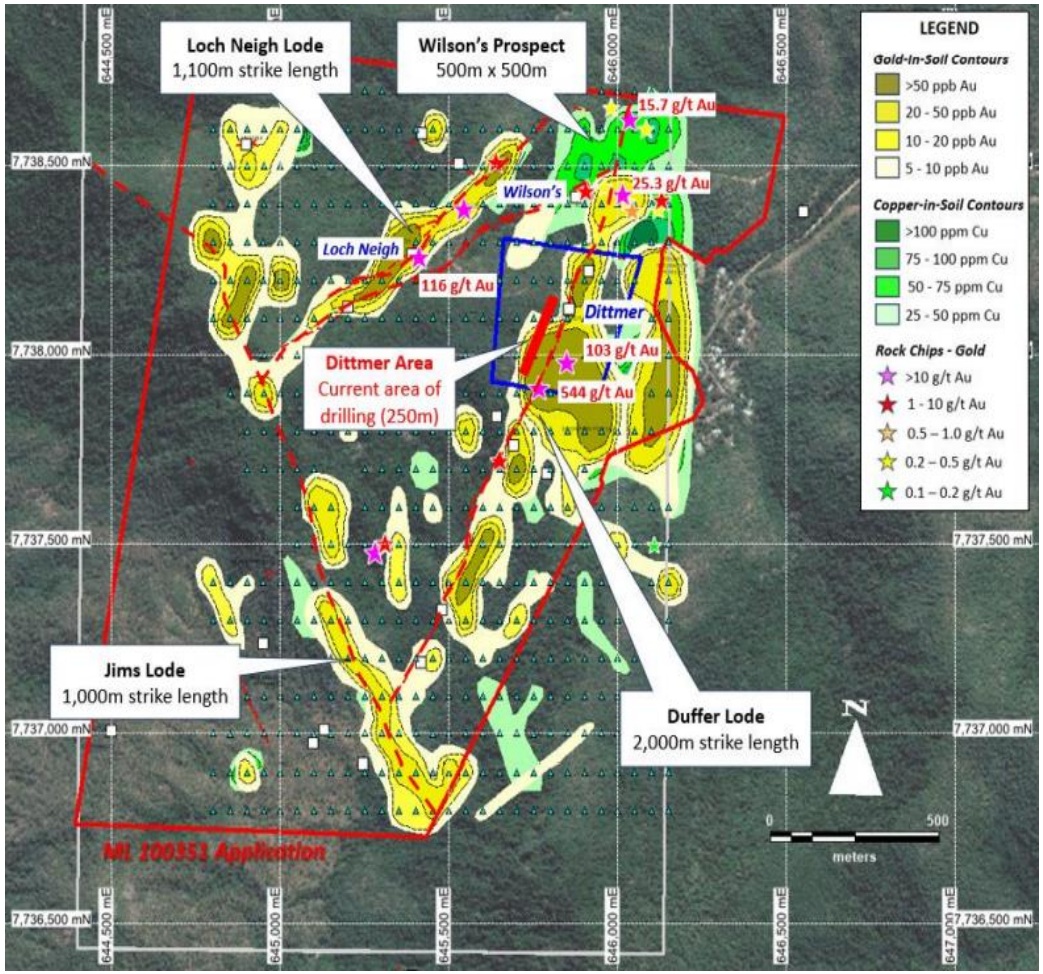


Fig. 25. Locations of copper and gold resources in the Dittmer mine project

Since September 2021, 18 out of 18 holes to date have encountered gold mineralisation, indicating the prospective lode extension runs over 260m along strike and 200m down-dip. It remains open along strike and down-dip and is broadening at depth.

Ballymore Resources Ltd., the EA holder, stated it will comply with current conditions of EPSL00460513 and the ML Code. But these requirements do not appear to address the impacts of the planned deep underground mining tunnels on groundwater flows from the site to the Great Barrier Reef.

Faulting and Groundwater

Surface faults and shear zones are common in the Ditmer, Kelsey Creek, Lethe Brook Creek, Goorganga and Repulse Bay areas (Fig. 26).

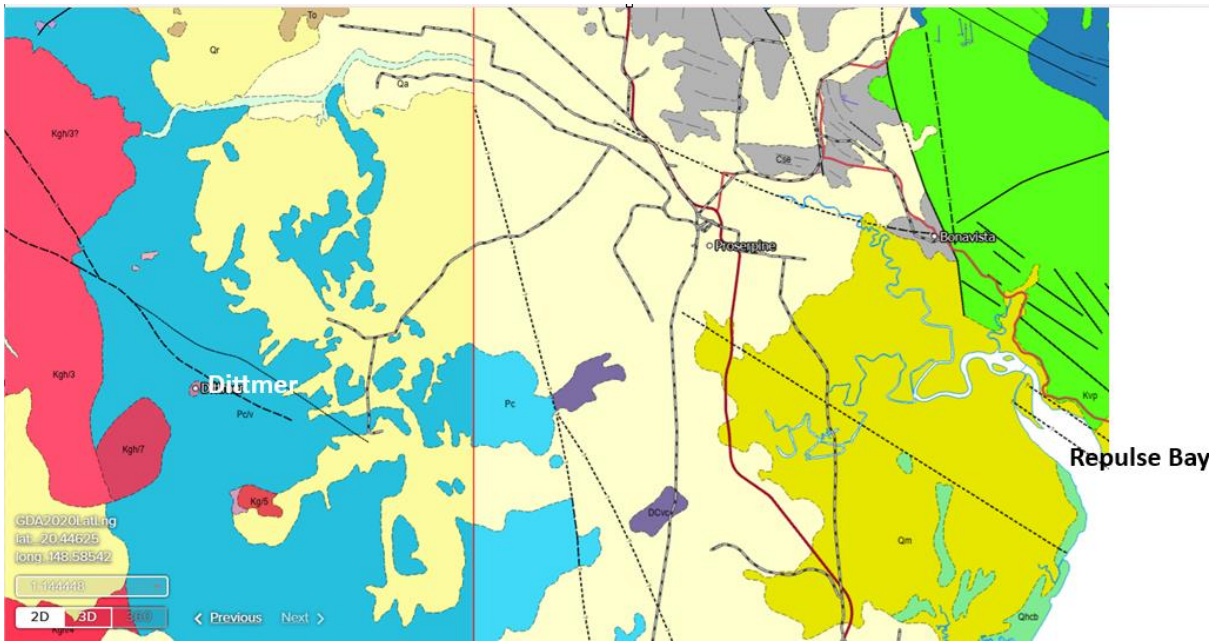


Fig. 26. Faults and shear zones near Dittmer and downstream to Repulse Bay. (QGLOBE)

The presence of deep faulting facilitates rainfall recharge to any near surface and paleochannel alluvial groundwater flows and may affect upwelling of groundwater from paleochannels farther downstream.

The Ballymore Resources map shows the gold resources split by a shear fault, the Dittmer Shear (Figs. 27(a) & (b)).

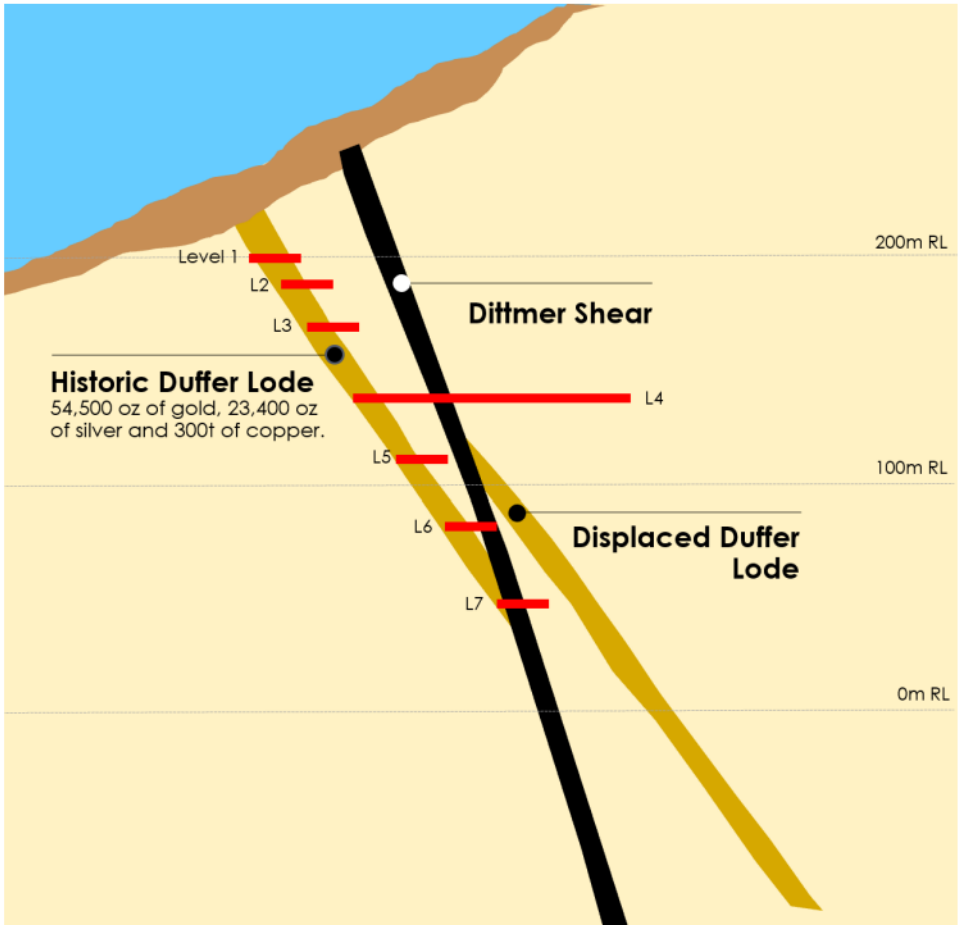


Fig. 27(a) Cross section of displaced Duffer Lode with underground workings and modelled lode extension confirmed by Ballymore drilling.[43]

[43] https://www.ballymoreresources.com/site/pdf/462db1ae-9ce5-48c5-96f3-f51fd5e541d0/Drilling-visible-gold-confirm-Dittmer-Gold-Mine-Extension.pdf

All major gold deposits are controlled by faults, but small fault systems are more likely to than larger ones.[44]

The presence of faults within the proposed Dittmer gold mine expansion 300m below the surface indicates that it is likely that some rainfall would percolate along fault lines via preferential flow to form groundwater. That groundwater would flow east travelling potentially some ~48.6km east to the coast through near surface aquifers and possibly through paleochannels formed in the last ice age.

There are a lot of paleochannels in the southern parts of the Goorganga wetlands.[45]

Groundwater appears to flow below Kelsey Creek and Lethe Brook Creek to the Proserpine River and through the Proserpine-Goorganga plain, a nationally important wetland site listed in the Australian Directory of Important Wetlands Area (DIWA), then into Repulse Bay and the Great Barrier Reef World Heritage Area.

The key geological feature of Proserpine catchment is a fault line, running through the catchment, from Bowen through the centre of Goorganga wetlands.[46]

[44] https://www.csiro.au/en/news/All/Articles/2013/June/fault-lines-lead-to-gold 14th June 2013.
[45] https://wetlandinfo.des.qld.gov.au/wetlands/ecology/processes-systems/water/catchment-stories/transcript-proserpine.html

[46] https://wetlandinfo.des.qld.gov.au/wetlands/ecology/processes-systems/water/catchment-stories/transcript-proserpine.html

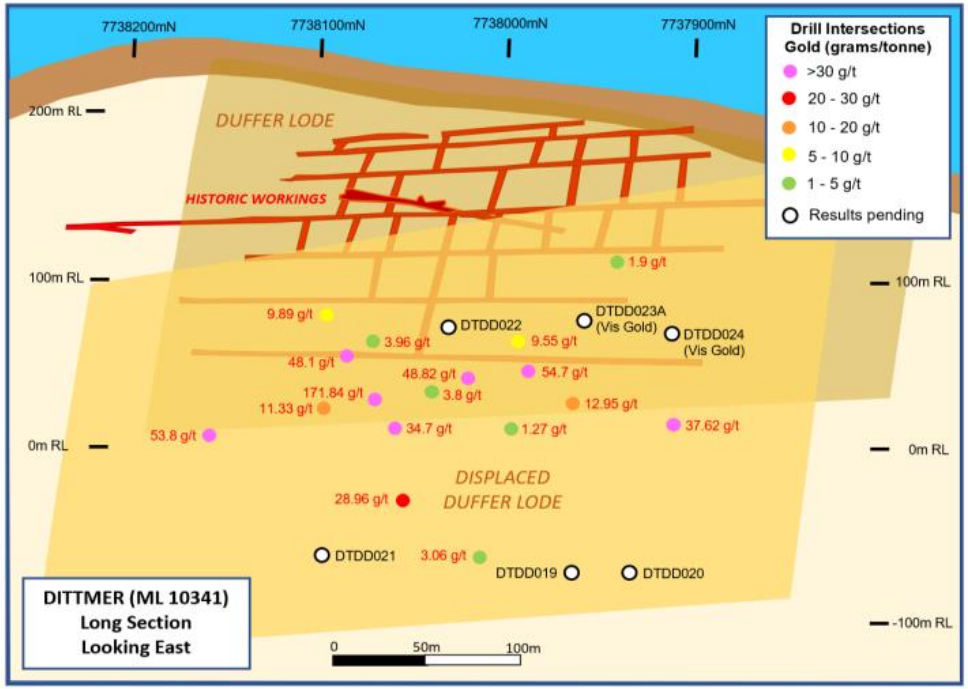


Fig. 27(b) Long section looking east at the Dittmer Mine area, showing the extent of historic workings on the Duffer Lode as well as the location of the fault-displaced Duffer Lode and high grade gold drill intersections to date.

Wonky Holes

This flow would explain observed areas of upwelling fresh water within Repulse Bay offshore from the Proserpine estuary (Fig. 28). These occur along the Queensland coast near large river mouths and are called “wonky holes”. Images that explain their formation are posted in Appendix II. They are copied from an online U-Tube video. Such flow is attributed to groundwater flow via alluvial paleo channels from the coastal mountains to the sea.

The implications of this for the Dittmer Mine project and any future expansions within their Mining Leases is that any toxics released in mining operations could flow in groundwater to the coast and GBRWHA relatively quickly through alluvia sediments associated with current and paleo riverine environments.

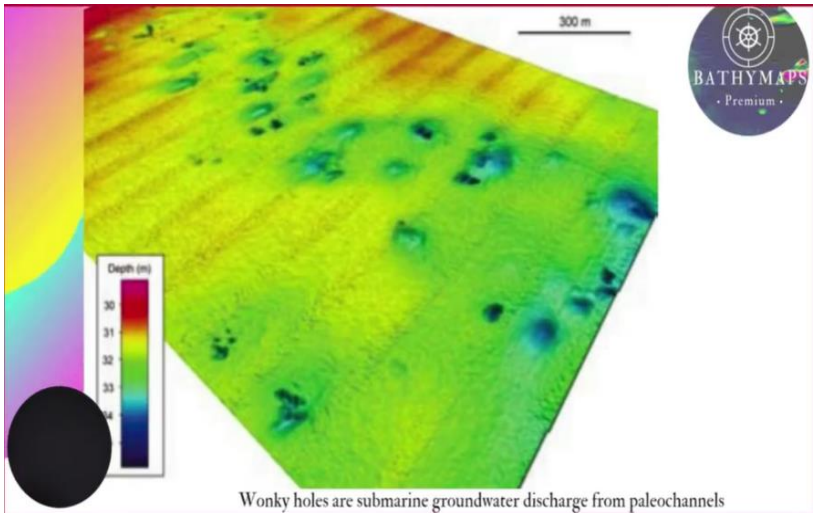


Fig. 28 Wonky holes depicted as dark blue circles in an offshore environment. See explanation of the formation of fresh water wonky holes offshore in Appendix II

Hydraulic Connectivity of the Dittmer mine to the coast and GBRWHA

Hydraulic Connectivity for the pre-clearing landscape downstream from the Dittmer mine location for surface streams is rated as infrequently connected from Kelsey Creek to Lethe Brook then intermittently connected through the upper Goorganga wetlands (Fig. 29).

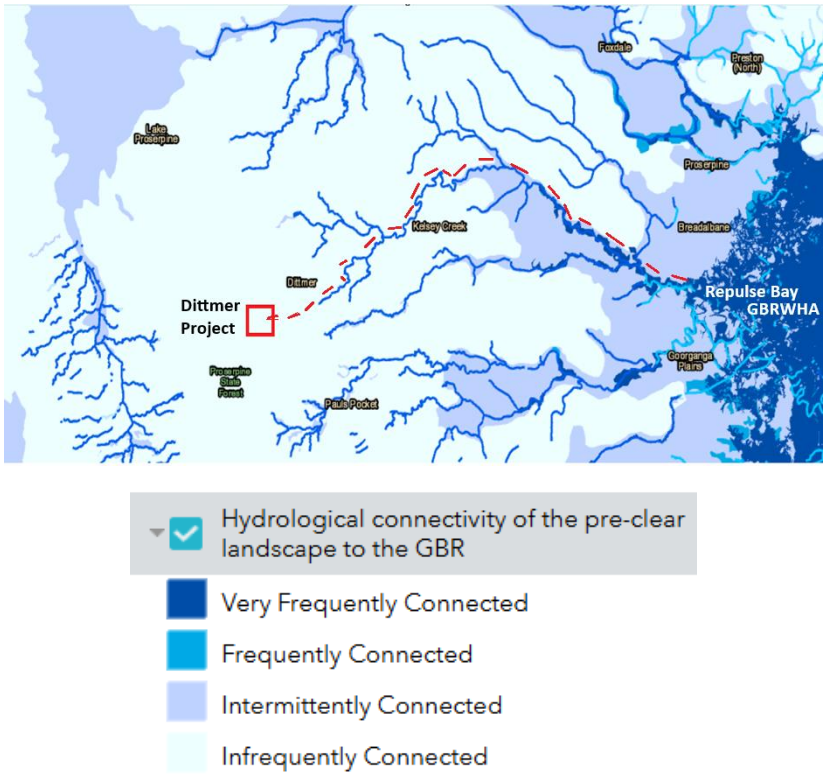


Fig. 29 Hydraulic connectivity from the Dittmer Mine Project to the mouth of the Proserpine River, Repulse Bay and the GBRWHA: the potential travel path for toxics from the mine site via surface water and groundwater flow pathways.

The maximum elevation at the Dittmer mine site is 400m. from there streamflow for Kelsey is east then northeast and then southeast to the GBR (Fig. 30).

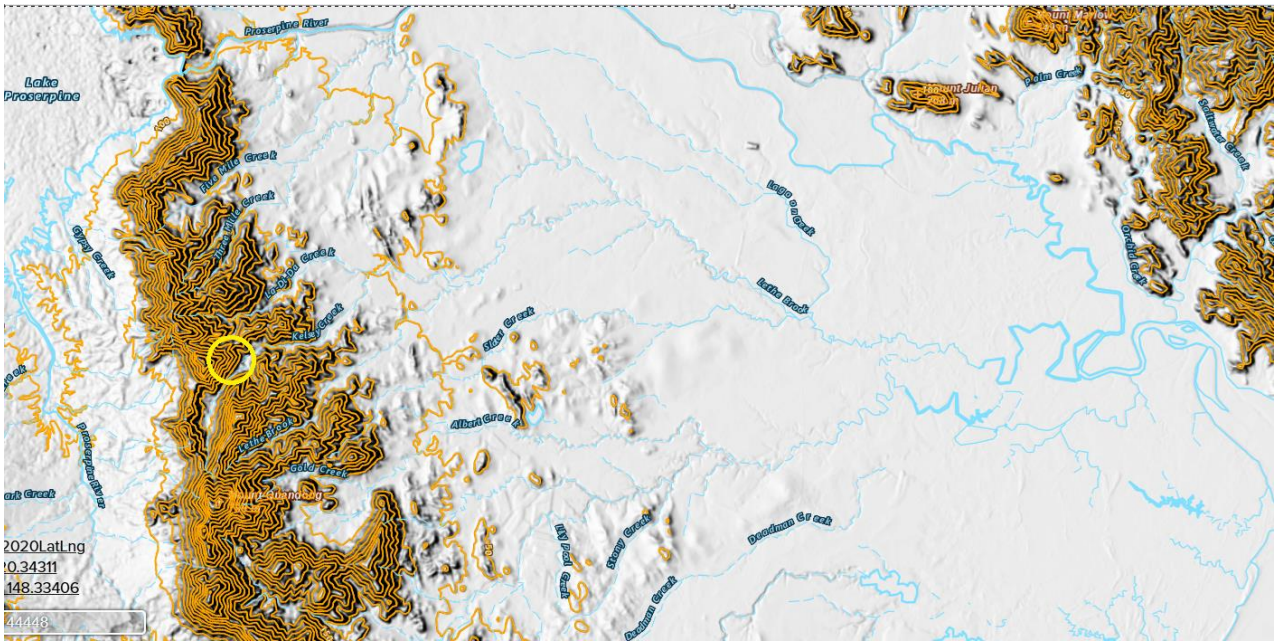


Fig. 30 Topography determines water flow pathway from the Dittmer mine site (yellow circle) at 400m to Repulse Bay at sea level.

Average annual rainfall isohyets

The Dittmer Mine project is in the highest average annual isohyet range with 1801mm at the site (Fig. 31).

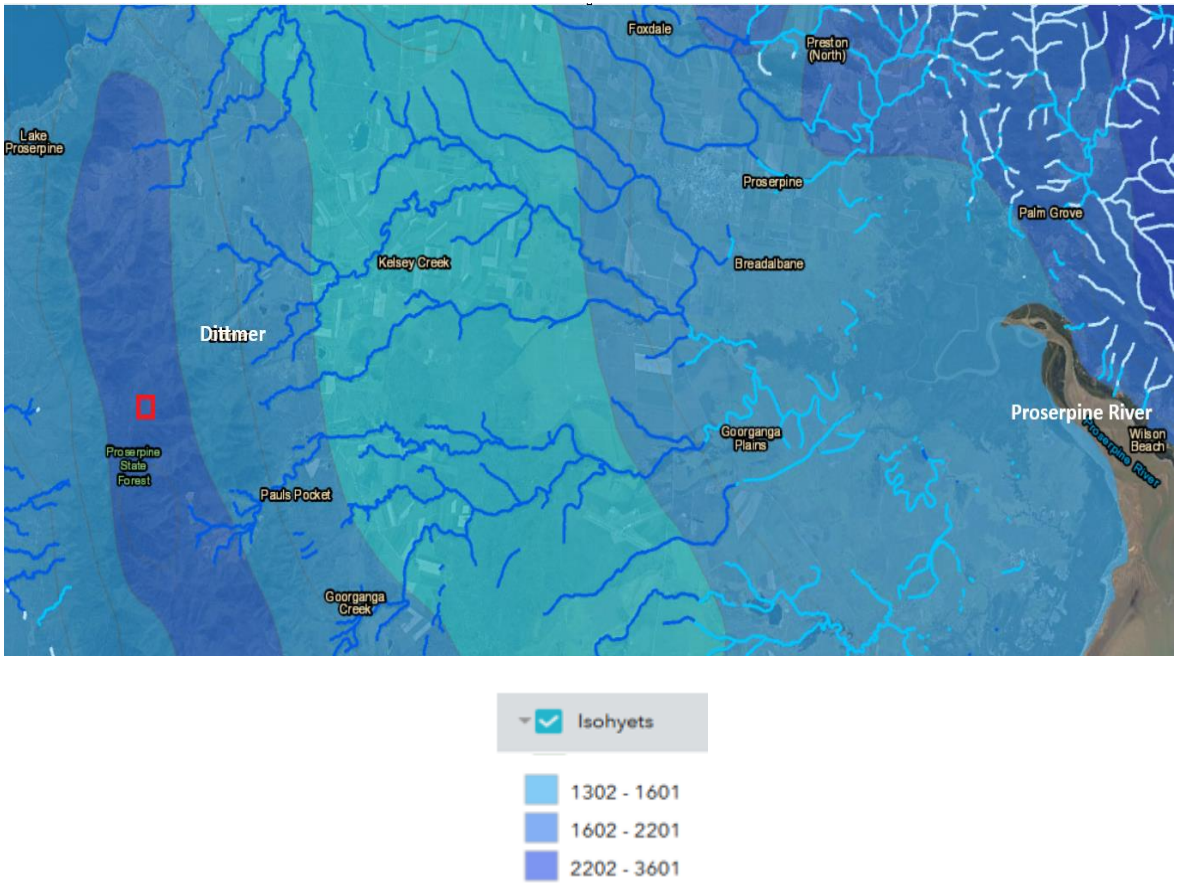
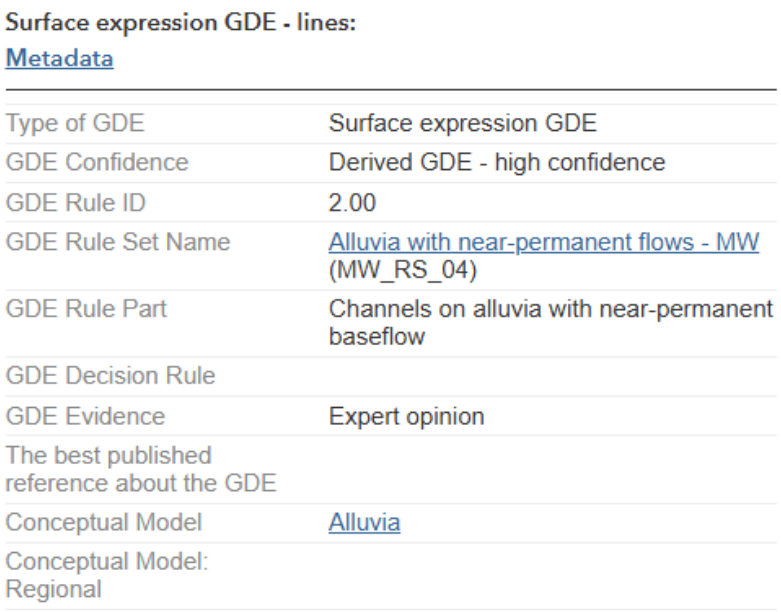


Fig. 31 Average annual isohyet ranges (mm) and surface waterways within and downstream of the Dittmer mine project (red).

Downstream Groundwater Dependent Ecosystems (GDEs)

Most of the waterways between Dittmer and Goorganga are mapped with High Confidence as the Surface expression of Groundwater Dependent ecosystems (Fig. 32)



Surface expression GDE - lines:

Metadata

Type of GDE	Surface expression GDE
GDE Confidence	Derived GDE - high confidence
GDE Rule ID	2.00
GDE Rule Set Name	Alluvia with near-permanent flows - MW (MW_RS_04)
GDE Rule Part	Channels on alluvia with near-permanent baseflow
GDE Decision Rule	
GDE Evidence	Expert opinion
The best published reference about the GDE	
Conceptual Model	Alluvia
Conceptual Model: Regional	

Fig. 32 Surface expression GDE lines to Goorganga – High confidence

These flows support the existence of Terrestrial Groundwater Dependent Ecosystems (Fig. 33)

Fig. 33 Terrestrial Groundwater Dependent Ecosystems (green)

Biodiversity and Riparian Corridors

The GDEs form an important biodiversity connectivity state significant corridor from the Clarke Range and Dittmer to the Goorganga Plain for fauna and flora species (Fig. 34).

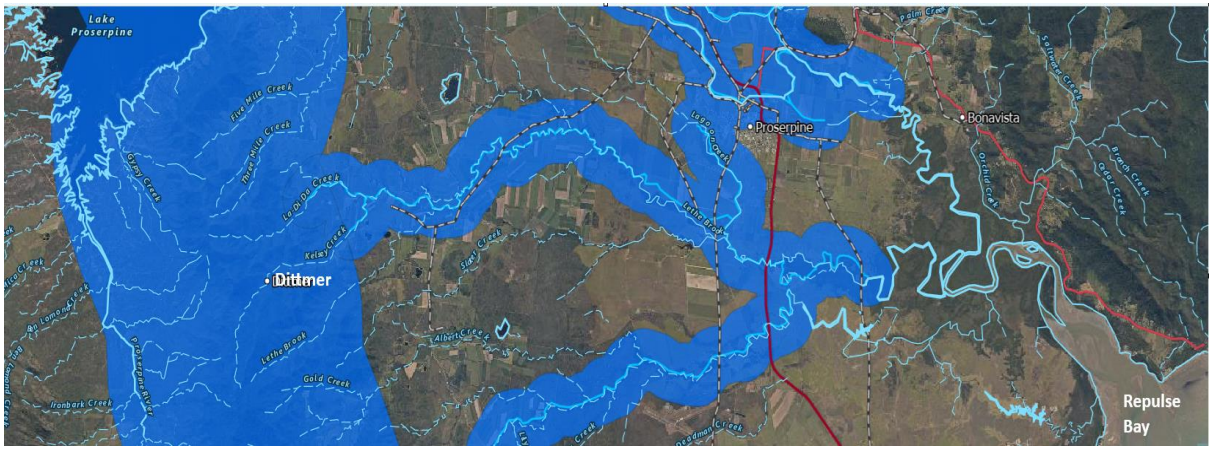


Fig. 34 State Significant Biodiversity Corridor from Dittmer along Kelsey and Lethe Brook Creeks GDEs to the Proserpine-Goorganga DIWA.

The Lethe Brook Creek riparian corridor is part of this biodiversity corridor and connects with the Lower Proserpine River (Fig. 35).

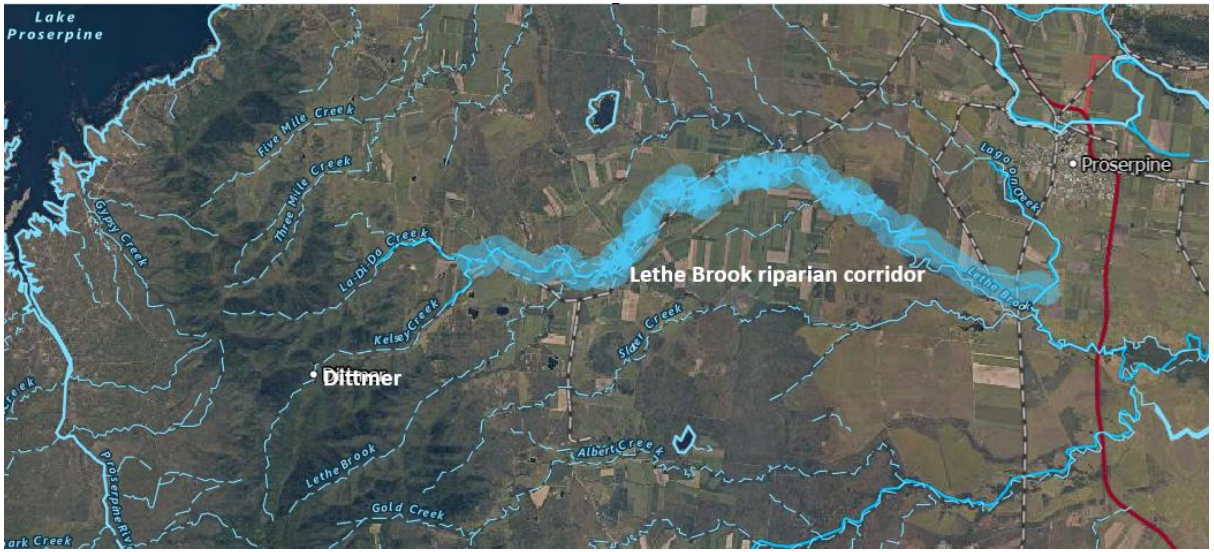


Fig. 35 The Lethe Brook Creek riparian corridor connects with the Lower Proserpine River

EPBC Protected Matters Search of the biodiversity and riparian corridors from Dittmer to Repulse Bay

EPBC-listed threatened species within this State level biodiversity corridor in a Wildnet search are the Australian painted snipe and the northern quoll (Table 1).

Kingdom	Class	Family	Scientific name	Common name	NCA	EPBC
animals	birds	Rostratulidae	Rostratula australis	Australian painted snipe	E	E
animals	mammals	Dasyuridae	Dasyurus hallucatus	northern quoll	C	E

Table 4 The Australian Painted snipe and northern quoll are threatened EPBC-listed species recorded with the state significant biodiversity corridor.

An EPBC Protected Matters Search on Nov 18th, 2024, of this waterway from Dittmer to the mouth of the Proserpine River (Fig. 36)and Table 5 shows the known number of threatened, and migratory marine EPBC-listed species by this GDE system and the coastal wetlands of the Goorganga plain. (Table 2). There are 15 bird, 2 mammal, 4 reptile and 4 plant species. Potentially there could be more and they could be indirectly impacted by any toxics flowing downstream from the Dittmer mine project, either during or long after mine closure.

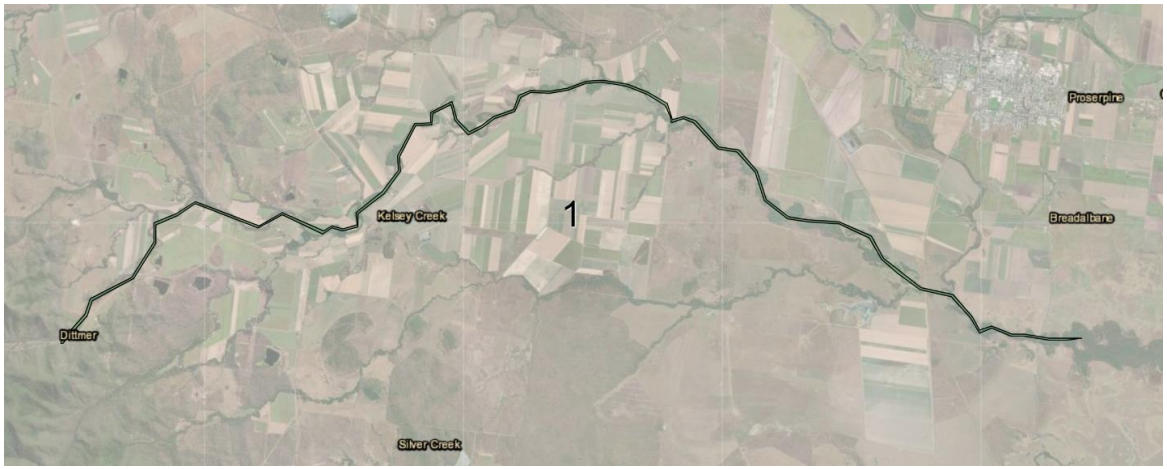


Fig. 36 Location of the Protected Matters Search (20m buffer zone) of the waterways downstream of the Dittmer mine project to the coast for threatened EPBC-listed species known to occur 18/11/2024.

Scientific Name	Common Name	Class	Presence Text	Threatened Category	Migratory Status	Migratory Category	Marine Status
Calidris ferruginea	Curlew Sandpiper	Bird	Species or species habitat known to occur within area	Critically Endangered	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Bird	Species or species habitat known to occur within area	Critically Endangered	Migratory	Migratory Wetlands Species	Listed
Tringa nebularia	Common Greenshank, Greenshank	Bird	Species or species habitat known to occur within area	Endangered	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Charadrius mongolus	Lesser Sand Plover, Mongolian Plover	Bird	Roosting known to occur within area	Endangered	Migratory	Migratory Wetlands Species	Listed
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	Bird	Species or species habitat known to occur within area	Endangered			
Limosa limosa	Black-tailed Godwit	Bird	Roosting known to occur within area	Endangered	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Rostratula australis	Australian Painted Snipe	Bird	Species or species habitat known to occur within area	Endangered			Listed - overfly marine area (as Rostratula benghalensis (sensu lato))

Hirundapus caudacutus	White-throated Needletail	Bird	Species or species habitat known to occur within area	Vulnerable	Migratory	Migratory Terrestrial Species	Listed - overfly marine area
Calidris acuminata	Sharp-tailed Sandpiper	Bird	Species or species habitat known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed
Xenus cinereus	Terek Sandpiper	Bird	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Calidris canutus	Red Knot, Knot	Bird	Species or species habitat known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Arenaria interpres	Ruddy Turnstone	Bird	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed
Pluvialis squatarola	Grey Plover	Bird	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Calidris tenuirostris	Great Knot	Bird	Roosting known to occur within area	Vulnerable	Migratory	Migratory Wetlands Species	Listed - overfly marine area

Petrogale persephone	Proserpine Rock-wallaby	Mammal	Species or species habitat known to occur within area	Endangered			
Xeromys myoides	Water Mouse, False Water Rat, Yirrkoo	Mammal	Species or species habitat known to occur within area	Vulnerable			
Caretta caretta	Loggerhead Turtle	Reptile	Species or species habitat known to occur within area	Endangered	Migratory	Migratory Marine Species	Listed
Eretmochelys imbricata	Hawksbill Turtle	Reptile	Foraging, feeding or related behaviour known to occur within area	Vulnerable	Migratory	Migratory Marine Species	Listed
Chelonia mydas	Green Turtle	Reptile	Breeding known to occur within area	Vulnerable	Migratory	Migratory Marine Species	Listed
Natator depressus	Flatback Turtle	Reptile	Breeding known to occur within area	Vulnerable	Migratory	Migratory Marine Species	Listed

Medicosma obovata	null	Plant	Species or species habitat known to occur within area	Vulnerable			
Graptophyllum ilicifolium	Holly-leaved Graptophyllum, Mt Blackwood Holly	Plant	Species or species habitat known to occur within area	Vulnerable			
Neisosperma kilneri	null	Plant	Species or species habitat known to occur within area	Vulnerable			
Eucalyptus raveretiana	Black Ironbox	Plant	Species or species habitat known to occur within area	Vulnerable			

Table 5. EPBC-listed threatened and wetland migratory species known to occur in the Protected Matters Search (20m buffer zone) of the waterways downstream of the Dittmer mine project to the coast.

EPBC-listed Migratory Species downstream including offshore species and excluding EPBC threatened species (Table 6). This includes 9 bird, 4 mammal and one shark species

Scientific Name	Common Name	Class	Text	Migratory Category
Actitis hypoleucos	Common Sandpiper	Bird	Species or species habitat known to occur within area	Migratory Wetlands Species
Fregata minor	Great Frigatebird,	Bird	Species or species habitat known to occur within area	Migratory Marine Birds
Actitis hypoleucos	Common Sandpiper	Bird	Species or species habitat known to occur within area	Migratory Wetlands Species
Pandion haliaetus	Osprey	Bird	Breeding known to occur within area	Migratory Wetlands Species
Pluvialis fulva	Pacific Golden Plover	Bird	Roosting known to occur within area	Migratory Wetlands Species
Tringa brevipes	Grey-tailed Tattler	Bird	Roosting known to occur within area	Migratory Wetlands Species
Numenius phaeopus	Whimbrel	Bird	Roosting known to occur within area	Migratory Wetlands Species
Calidris ruficollis	Red-necked Stint	Bird	Roosting known to occur within area	Migratory Wetlands Species
Limosa lapponica	Bar-tailed Godwit	Bird	Species or species habitat known to occur within area	Migratory Wetlands Species
Orcaella heinsohni	Australian Snubfin	Mammal	Species or species habitat known to occur within area	Migratory Marine Species
Sousa sahulensis	Australian Humpback	Mammal	Breeding known to occur within area	Migratory Marine Species
Dugong dugon	Dugong	Mammal	Species or species habitat known to occur within area	Migratory Marine Species
Megaptera novaeangliae	Humpback Whale	Mammal	Species or species habitat known to occur within area	Migratory Marine Species
Anoxypristis cuspidata	Narrow Sawfish,	Shark	Species or species habitat known to occur within area	Migratory Marine Species

Table 6. EPBC-listed Migratory Species downstream excluding EPBC threatened species

In addition, the EPBC-listed Endangered Red goshawk is associated with the endangered regional ecosystem RE 8.3.5 which is present downstream (Fig. 36).

The impacts of groundwater withdrawal for the Dittmer gold mine operations on this riparian vegetation and the EPBC-listed species e.g. the endangered red goshawk, that use small patches that remain of endangered Regional Ecosystem 8.3.5 that is present there should also be addressed as part of an EPBC Referral.

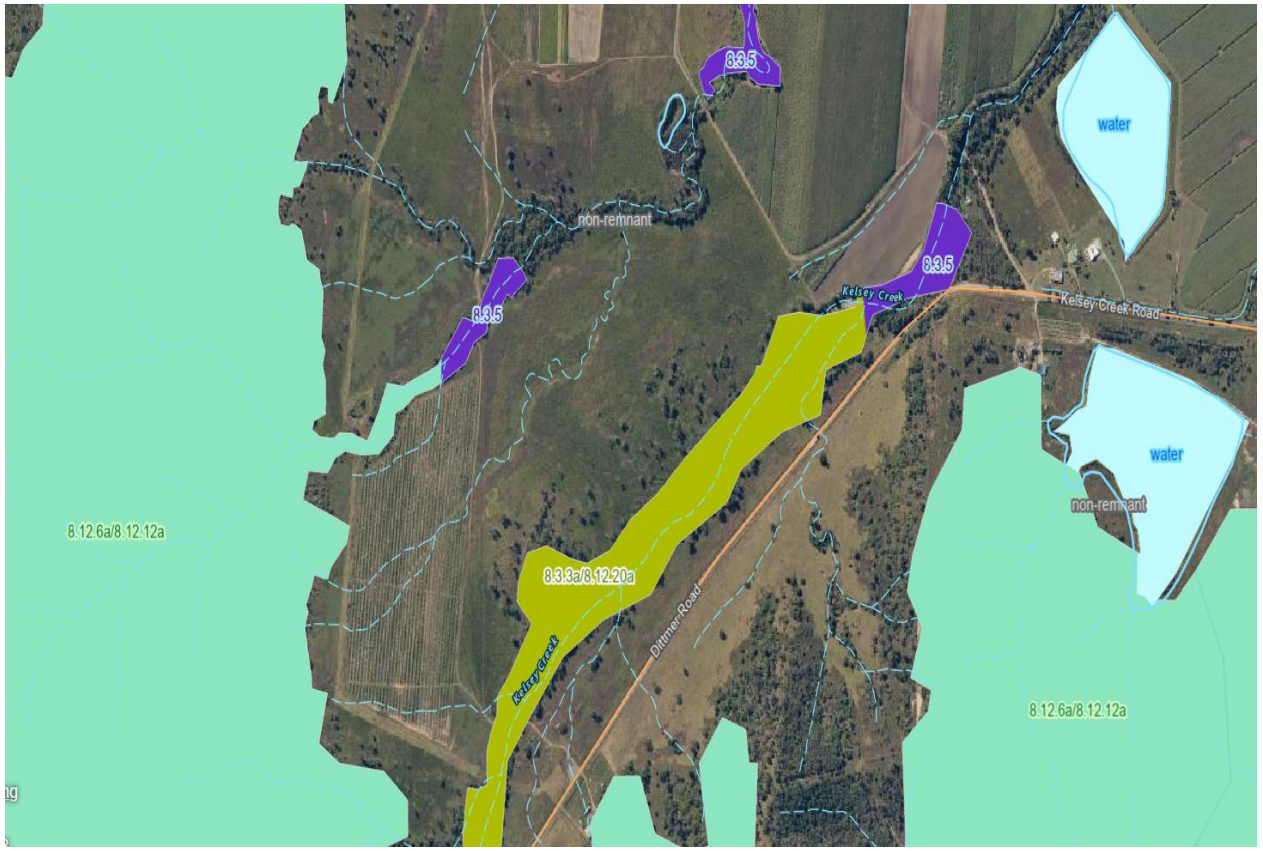


Fig.37 Patches (purple) of endangered RE8.3.5 along Kelsey and La De Da Creeks. Habitat for the Red Goshawk (EPBC endangered). Enlarged view.

MNES in the Proserpine- Goorganga nationally important wetlands (DIWA) (Fig. 38)

Fig. 38 Location of the Proserpine-Goorganga nationally important wetland

Elevation:	Less than 20 m ASL, most less than 10 m ASL.
Other listed wetlands in same aggregation:	None.
Wetland type:	A1, A5, A6, A7, A8, A9, B14, A11, B1, B4, B6, B10, A10
Criteria for inclusion:	1, 2, 3, 5,

The Ramsar Convention on Wetlands defines wise use of wetlands as “the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development”. Wise use can thus be seen as the conservation and sustainable use of wetlands and all the services they provide, for the benefit of people and nature.[47]

It includes **protection** of the natural resources and function of floodplains.

There are potentially 17 EPBC threatened species in the Proserpine-Goorganga DIWA (Table 4).

There are 5 bird, 4 mammals, 2 reptile and 1 plant species listed. Two are Migratory Wetland and one is Migratory Terrestrial species.

Nine of these 17 species are described as Likely to be there.

[47] https://www.ramsar.org/about/our-mission/wise-use-wetlands

Listed Threatened Species [Resource Information]

Species ID	Scientific Name	Common Name	Class	Simple Presence	Presence Text	Threatened Category	Migratory Status	Migratory Category	Marine
226	*Petrogale persephone*	Proserpine Rock-	Mammal	Likely	Species or species	Endangered			
942	*Erythrotriorchis*	Red Goshawk	Bird	Likely	Species or species	Endangered			
331	*Dasyurus hallucatus*	Northern Quoll, Digul	Mammal	Known	Species or species	Endangered			
254	*Petauroides volans*	Greater Glider	Mammal	Likely	Species or species	Endangered			
874	*Calidris acuminata*	Sharp-tailed Sandpiper	Bird	May	Species or species	Vulnerable	Migratory	Migratory Wetlands	Listed
1420	*Egernia rugosa*	Yakka Skink	Reptile	May	Species or species	Vulnerable			
682	*Hirundapus*	White-throated	Bird	May	Species or species	Vulnerable	Migratory	Migratory Terrestrial	Listed -
64440	*Geophaps scripta*	Squatter Pigeon	Bird	May	Species or species	Vulnerable			
1193	*Denisonia maculata*	Ornamental Snake	Reptile	May	Species or species	Vulnerable			
16344	*Eucalyptus raveretiana*	Black Ironbox	Plant	May	Species or species	Vulnerable			
863	*Gallinago hardwickii*	Latham's Snipe,	Bird	Likely	Species or species	Vulnerable	Migratory	Migratory Wetlands	Listed -
86555	*Phlegmariurus*	Square Tassel Fern	Plant	May	Species or species	Vulnerable			
14159	*Dichanthium setosum*	bluegrass	Plant	May	Species or species	Vulnerable			
929	*Falco hypoleucos*	Grey Falcon	Bird	Likely	Species or species	Vulnerable			
26048	*Tyto novaehollandiae*	Masked Owl (northern)	Bird	Likely	Species or species	Vulnerable			
174	*Macroderma gigas*	Ghost Bat	Mammal	Likely	Species or species	Vulnerable			
64586	*Omphalea celata*	null	Plant	Likely	Species or species	Vulnerable			

Table 7. Proserpine-Goorganga DIWA wetland EPBC Protected Matters Search November 2024.

BAMM Assessment of the biodiversity values within the Dittmer mine project area

All the Dittmer ML is assessed as of State Significance for Biodiversity (Fig. 39) and BAMM criteria ratings (Tables 8 & 9).

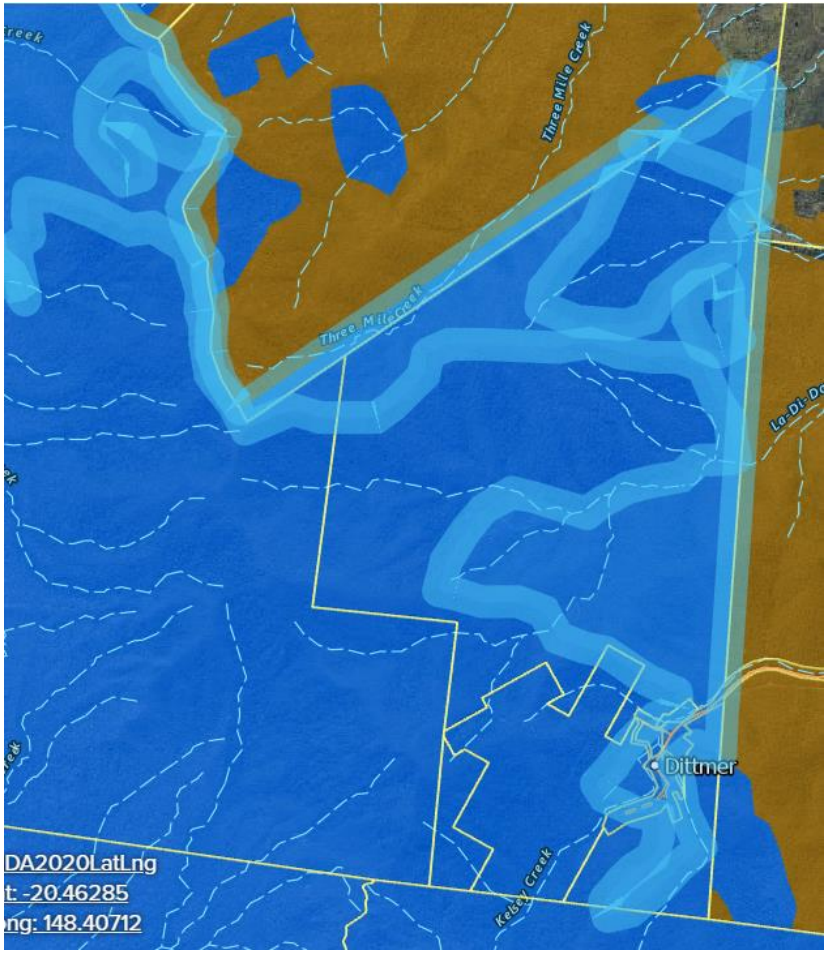


Fig. 39 All of the Dittmer ML is classified as of State Significance for biodiversity.

BAMM ratings

Eastern section of the ML

Criterion D2 : relative ecosystem size (subregion)	HIGH
Criterion E : condition	VERY HIGH
Criterion F : ecosystem diversity	HIGH
Criterion G : context and connection	MEDIUM

And rate it as qualifying for Wildlife Refugia.

Table 8 BAMM Criteria ratings for the eastern section of the ML

The southern section is also rated well i.e.

Criterion D1 : relative ecosystem size (bioregion)	VERY HIGH
Criterion D2 : relative ecosystem size (subregion)	VERY HIGH
Criterion E : condition	VERY HIGH
Criterion F : ecosystem diversity	HIGH
Criterion G : context and connection	MEDIUM
Criterion I : special biodiversity values (overall rating for all sub-criteria)	Y
Criterion Ib : wildlife refugia	Wildlife refugia
Criterion Ic : concentration of disjunct populations	Disjunct populations
Criterion Id : concentration of taxa at the limits of their geographic ranges	Taxa at limit of geographic range

Table 9. BAMM Criteria ratings for the southern section of the ML

Whitsunday Water Plan

The Whitsunday Water Plan (WWP) limits the taking of any overland flow. Ballymore has stated that it will collect overland flow and use it for onsite purposes. How does that fit with the WWP and water supply for the Kelsey Creek and Lethebrook areas which contain MNES, and the Whitsunday Groundwater Area Plan?

Downstream impacts

Section 17 of the ***Environmental Protection Act 1994*** defines serious environmental harm as

1) serious environmental harm (other than environmental nuisance)

(a) that is irreversible, of a high impact or widespread; or

(b) caused to –

(i) an area of high conservation value;

(ii) an area of special significance, such as the Great Barrier Reef World Heritage Area;

(c) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount; or

(d) that results in costs of more than the threshold amount being incurred in taking appropriate action to—

(i) prevent or minimise the harm; and

(ii) rehabilitate or restore the environment to its condition before the harm.

2) In this section - "Threshold amount" means $50 000 or, if a greater amount is prescribed by regulation, the greater amount.

Mining affects biodiversity and natural heritage at scales ranging from the area of mineral extraction to processes operating at landscape to regional scales and beyond. Habitat loss and degradation are the most immediate and direct impacts, with flow-on impacts that change species distributions and ecosystem condition. Mining activities – such as mineral exploration, resource excavation, and groundwater drawdown and reinjection – can threaten the viability of certain species, such as subterranean fauna.[48]

[48] State of the Environment 2021. https://soe.dcceew.gov.au/overview/pressures/industry#:~:text=Impacts%20on%20air%20quality%20from,Gorge%20(see%20Indigenous%20heritage).

Gold mining has been identified as a significant source of environmental degradation. Gold mining can have devastating effects on nearby water resources, contaminating them with toxic mine waste that contains dangerous and persistent chemicals such as arsenic, lead, mercury, and cyanide.

Australia ranks second worldwide in gold production.

Once pollutants enter water bodies, they can harm aquatic ecosystems, wildlife, and human health. This could include stygofauna in groundwater systems.

The legacy impacts of gold mines or the long-term effects of mining on MNES cannot be ignored.

The Proserpine catchment shows how natural and modified features within the landscape impact on how water flows. These issues need to be managed to ensure that the significant natural (and social) values of the catchment are protected, and to minimise impacts on the multitude of values within the catchment and downstream in the GBR, while providing for residential, water supply, farming and other important land uses of the catchment.[49]

Surface water flows

The Water Quality Plan for the Whitsundays focuses on pollutants from sugar cane farming and not inorganic pollutants from gold mining such as arsenic, lead, mercury and cyanide. Therefore, a water monitoring and management plan for such pollutants would appear to be necessary for the Dittmer Mine expansion, not only on site but also downstream from Kelsey River to Repulse Bay.

Commonwealth legislation does require water quality monitoring, but only for larger scale mining operations.

Yet given the Dittmer Mine could adversely impact MSES downstream. Surely monitoring of surface and groundwater quality for such toxics should be required. Yet the EA for this project, EA EPSL00460513, sets no water monitoring requirements and standards for acceptable levels of these toxics in surface and groundwater downstream of the project.

The Dittmer mine (red outline) has only been infrequently connected via upper Kelsey Creek and to Lethe Brook. Then it is intermittently connected through the Proserpine River. After that it is very frequently connected via the Lower Proserpine River to Repulse Bay and the Great Barrier Reef.

[49] https://wetlandinfo.des.qld.gov.au/wetlands/ecology/processes-systems/water/catchment-stories/transcript-proserpine.html

Groundwater

Generally, the Water Quality Guidelines should apply to the quality of both surface water and of groundwater, since the community values which they protect relate to above-ground uses (e.g. irrigation, drinking water, farm animal or fish production and maintenance of aquatic ecosystems).

Hence, groundwater should be managed in such a way that when it comes to the surface, whether from natural seepages or from bores, it will not cause the established water quality objectives for these waters to be exceeded, nor compromise their designated community values.

In addition to this, underground aquatic ecosystems and any novel fauna also need to be protected. Relatively little is still known of the lifecycles and environmental requirements of groundwater communities. Where potentially high conservation values are identified, the groundwater upon which the communities depend should be afforded the highest level of protection, at least until further knowledge is gained.

Basing groundwater quality objectives on data from groundwater reference condition locations is recommended to achieve this protection. It is important to note that different biological, physical and chemical conditions and processes operate in groundwater compared with surface waters, and these can affect the fate and transport of many chemicals. This may have implications for the application of guideline values and overall management of groundwater quality.[50]

The Water Act 2000 aims to maintain or improve the quality of naturally occurring water. The Act regulates allocation and sustainable management of groundwater resources. The Act is administered by the Department of Natural Resources and Mines. The Sustainable Planning Act 2009 requires planning to coincide with the Environmental Protection Act 1994 and overall environmental protection. Land use is a core matter to the planning scheme, along with valuable features (such as quality of water). The Act is administered by the Department of State Development, Infrastructure and Planning. The Environmental Protection Act 1994 aims to protect Queensland's environment. The Act permits the Department of Environment and Heritage Protection to prepare environmental protection policies, which can protect environmental values such as water quality.[51]

[50] https://www.waterquality.gov.au/anz-guidelines/resources/guidance/groundwater

[51] https://www.waterquality.gov.au/sites/default/files/documents/guidelines-groundwater-quality-protection.pdf

A groundwater management plan can be developed to protect the environmental value category of groundwater, which recognises community and stakeholder values of the resource and sets out measures to reduce the risk of degrading an assigned environmental value, an approach to monitoring and a review and improvement approach.[52]

Groundwater vulnerability mapping has proven to be a technique in assisting the development of groundwater protection strategies as outlined in the *1995 Guidelines for Groundwater Protection in Australia* (ARMCANZ and ANZECC). These guidelines are *part of the National Water Quality Management Strategy.*

Groundwater vulnerability mapping is used as a guide in determining which areas are more susceptible to groundwater contamination within the mapped area.

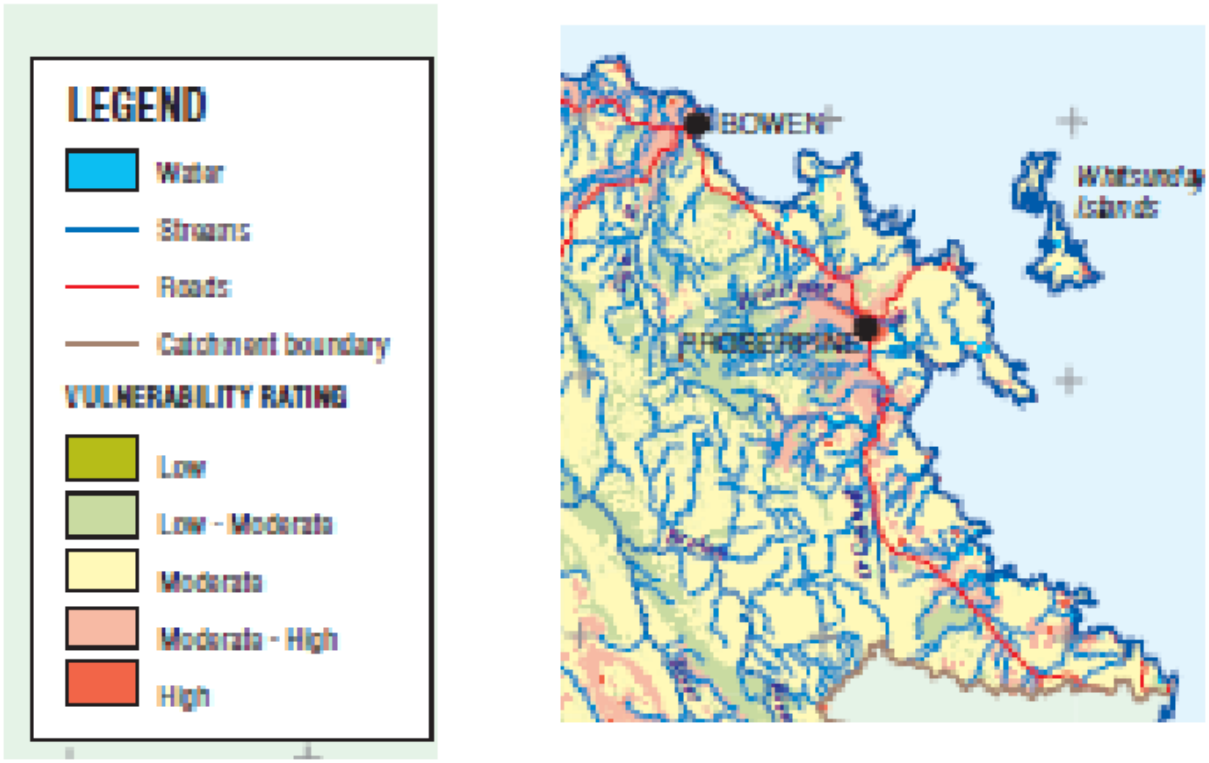
It should be noted that groundwater vulnerability maps are accurate to the scale at which they are produced. The (former) Department of Land and Water Conservation (DLWC) does not endorse the expansion of this scale.

The preparation of groundwater vulnerability maps involves the simplification of complex geologic and hydrogeologic situations. It is therefore important to take into account local site conditions when assessing a particular development. Vulnerability maps are designed only as a guide and are not intended to replace an environmental impact assessment.

Groundwater quality issues are receiving widespread attention, and hydrogeologic information is essential for the effective protection and management of groundwater quality. Effective protection should be primarily aimed at the prevention of problems and requires a sound information base to determine, on a continuous basis, the groundwater quality problems that exist and those that may develop in the future. Groundwater vulnerability maps are used as a guide for the location of future developments in an area, in order to minimise the impact the projected development will have on the surrounding water resources.

Groundwater downstream of the Dittmer mine project as been assessed as to its vulnerability (Fig. 40).

[52] https://www.waterquality.gov.au/sites/default/files/documents/guidelines-groundwater-quality-protection.pdf



Source: Groundwater vulnerability mapping of Queensland. Stenson, Matthew (2002)

Fig. 40 Groundwater vulnerability in the Whitsundays

MODERATELY HIGH Moderately high vulnerability ranked groundwater resources are found in similar terrains as the High vulnerability class where high recharge potential, depth to water table, geology and unsaturated Vadose Zone play a very important role.

Kelsey Creek rates as Low-Moderate to Moderate-High for Lethe Brook and through the Goorganga wetlands then Moderate to the coast.

It is important then to understand how and groundwater pollution from the Dittmer mine project may affect groundwater and the health of the GDEs and their flora and fauna including MNES.

Matters of National Environmental Significance (MNES) that could be Adversely Impacted by the Dittmer mine project.

A search of the EPBC Act Public Portal for all Referrals for MNES showed that Ballymore Resources Ltd has not made any EPBC Referrals for its proposed Dittmer Gold Mine extension project, despite the presence there of at least two EPBC-listed threatened species: the Proserpine rock wallaby and the northern quoll. The project is within the headwaters of Kelsey Creek which is within the Proserpine River basin in the Whitsundays Regional Council area of Queensland. Downstream, of this project is a national listed wetland the Proserpine-Goorganga plain, a Dugong and Turtle nesting area in Repulse Bay and a nearshore section of the Great Barrier Reef. These waterways to the GBRWHA contain many MNES.

Given the potential for on-site and downstream surface water and groundwater pollution and the existence of a high number of MNES why hasn't there been an EPBC Referral to date or even an Environmental Impact Assessment (EIS)? The pollutants associated with gold mining are persistent inorganic toxics and their potential to impact this high biodiversity region well into the future should and must be assessed thoroughly.

MNES within the Dittmer mine project

An EPBC Protected Matters Search within the Preliminary Mine Plan for the Dittmer Project MLA (with a 1km buffer zone) listed two endangered mammal species, the northern quoll and the Proserpine rock wallaby and their habitats, that could be adversely impacted by mining. All of the land plant species were listed as common (NCA) with no EPBC Threatened species listed (Table 10).

Kingdom	Class	Family	Scientific Name	Common Name	EPBC
animals	mammals	Dasyuridae	Dasyurus hallucatus	Northern quoll	Endangered
animals	mammals	Macropodidae	Petrogale persephone	Proserpine rock-wallaby	Endangered

Table 10 Threatened mammal Species Protected Matters Search Dittmer mine project area.

Proserpine Rock Wallaby

In their Environmental Authority Permit - EPSL00460513 Amendment application - A-EA-AMD-100486450, Ballymore states that the Dittmer Mine expansion is not likely to have a significant impact on MNES, i.e. the Proserpine rock wallaby and Northern quoll populations within the ML.

Have there been fauna surveys undertaken to determine if the existing populations are significant or not in the mine's impact area? If so where is that information? There also appears to be no EIS for the project.

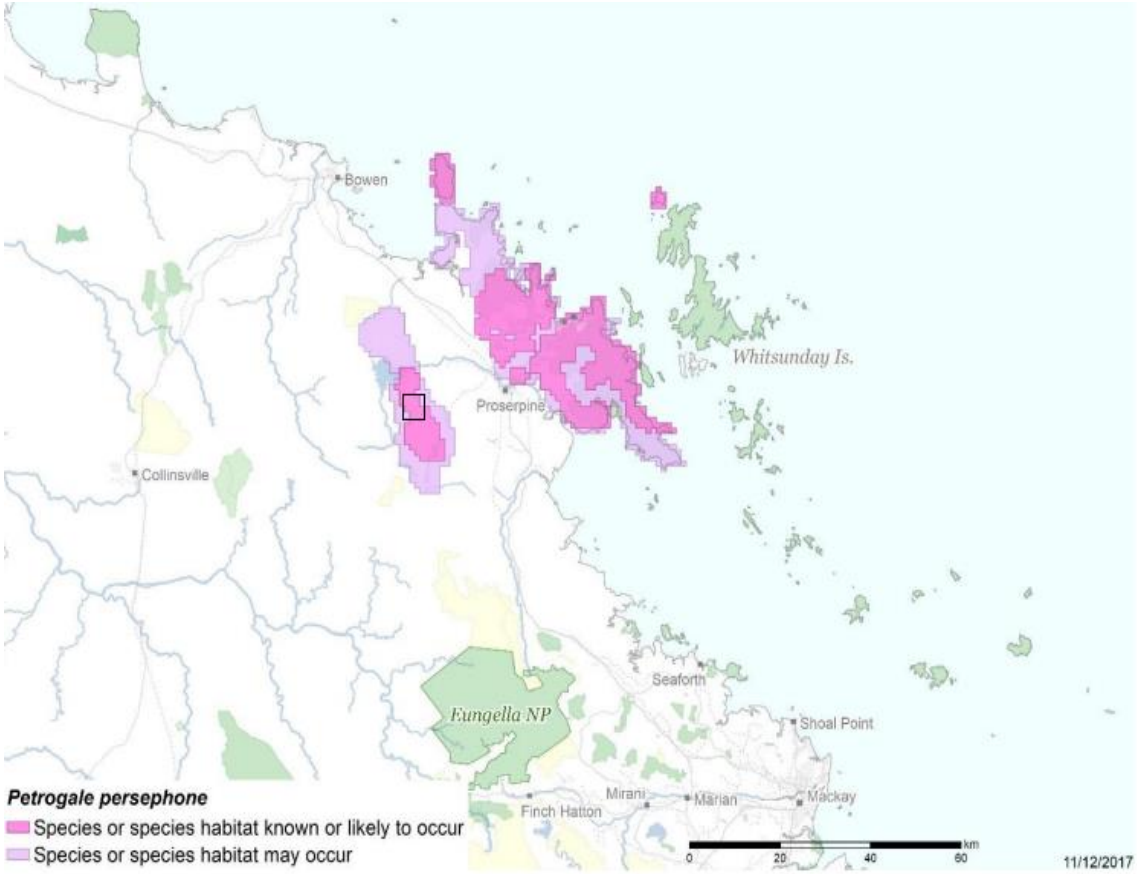
SPRAT Conservation advice for this species (Fig.) maps the area where the Dittmer min project ML would be as species habitat known or likely to occur

QGLOBE maps most of the area as essential MSES wildlife habitat for endangered or vulnerable species.

The Proserpine rock wallaby (Petrogale persephone) is an endangered species of wallaby that is native to Queensland, Australia endemic to the Whitsundays. It's a unique species that's not found anywhere else in the world . Habitat loss and fragmentation is the main threat.

DESI has the following listing of the conservation status of this species at the state, Commonwealth, and international scales.

Nature Conservation Act 1992 **(NCA) status:** Endangered
Environment Protection and Biodiversity Conservation Act 1999 **(EPBC) status** Endangered
IUCN Endangered
Conservation significant: Yes



The black outline indicates the approximate area where the Dittmer mine project would be located.
Where species habitat is known or likely to occur.

Fig. 41 Proserpine wallaby habitat locations

The Proserpine rock-wallaby requires rocky outcrops, rock piles, and cliffs within a sloping microphyll/notophyll semi-deciduous dry vine forest in order to survive as these locations provide the best access to food and the ability to evade predators. Large rock piles act as a refuge site not only for protection from

predators, but also aid in reducing the effects of high temperatures and humidity during summer months. During dry periods, colonies will move to the edges of the vine forest to feed on grasses.[53]

The Dittmer mine project site fits all these habitat descriptions. RE 8.12.2 Evergreen notophyll to complex notophyll vine forest of uplands, highlands and foothills on Mesozoic to Proterozoic igneous rock. It covers most of the Dittmer mine project site (Fig. 32).

The black outline indicates the approximate area where the Dittmer mine project would be located.
Where species habitat is known or likely to occur.

Fig. 30 Proserpine wallaby habitat locations

The Proserpine rock-wallaby requires rocky outcrops, rock piles, and cliffs within a sloping microphyll/notophyll semi-deciduous dry vine forest in order to survive as these locations provide the best access to food and the ability to evade predators. Large rock piles act as a refuge site not only for protection from predators, but also aid in reducing the effects of high temperatures and humidity during summer months. During dry periods, colonies will move to the edges of the vine forest to feed on grasses.[54]

The Dittmer mine project site fits all these habitat descriptions. RE 8.12.2 Evergreen notophyll to complex notophyll vine forest of uplands, highlands and foothills on Mesozoic to Proterozoic igneous rock. It covers most of the Dittmer mine project site (Fig. 42).

[53] Department of Agriculture, Water and the Environment 2021, Conservation advice for Petrogale persephone (Proserpine Rock-wallaby), Canberra

[54] Department of Agriculture, Water and the Environment 2021, Conservation advice for Petrogale persephone (Proserpine Rock-wallaby), Canberra

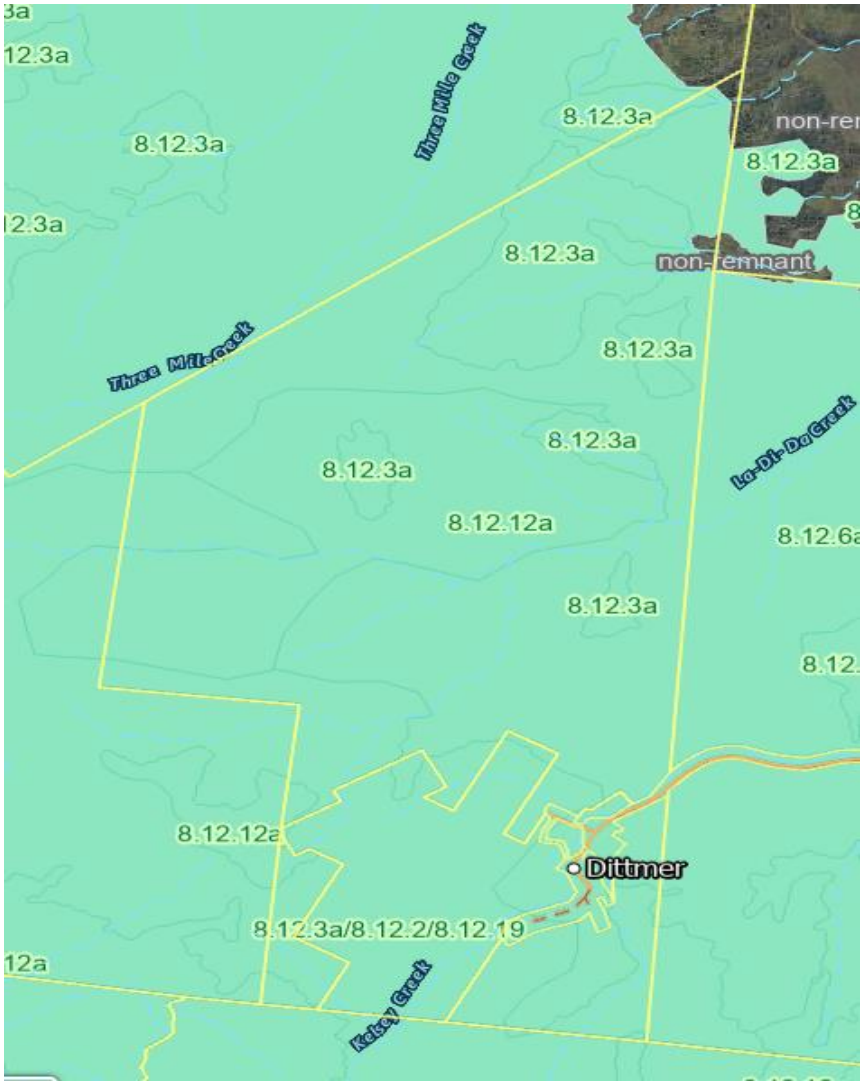


Fig. 42 Regional ecosystems in the Dittmer mine project area include suitable Proserpine wallaby habitat RE 8.12.2

8.12.3(a) Evergreen to semi-evergreen, notophyll to microphyll, vine forest to vine thicket of foothills and uplands on Mesozoic to Proterozoic igneous rocks.

8.12.19 Semi-deciduous complex notophyll feather palm vine forest of sheltered gullies and slopes of foothills and uplands on Mesozoic to Proterozoic igneous rocks.

Habitat fragmentation either in or between the species habitat needs to be avoided or minimized as there is currently no protection over areas that join two Proserpine habitats leading them to be cut off from one another.[55]

The Dittmer mine project is in steep, hilly and rocky terrain (Fig. 43).

[55] https://en.wikipedia.org/wiki/Proserpine_rockwallaby#:~:text=The%20Proserpine%20rock%2Dwallaby%20(Petrogale,B1ab(iii%2Cv)
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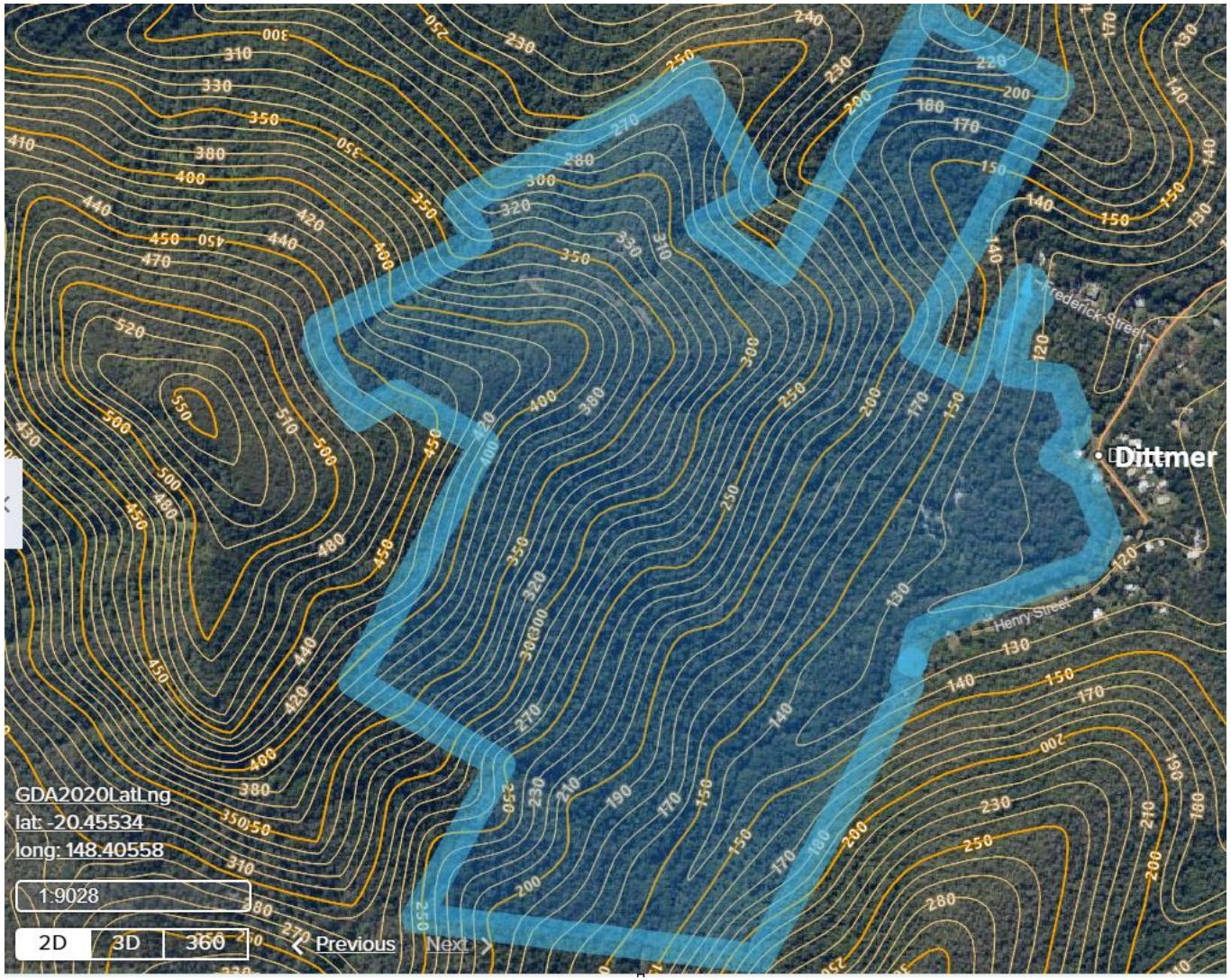


Fig. 43 Maximum elevation for the steep rocky slope of the Dittmer mine project is 450 m

The Matters of State Significance map from QGLOBE shows the locations within this ML area for habitat for endangered or vulnerable species (Fig. 44). That would be for the Proserpine rock wallaby as the Northern quoll is still listed as Least Concern by the Queensland Herbarium.

The QGLOBE map for essential Habitat for threatened species combines with elevation and the location of the lot and plan for the Dittmer mine project (black circle) shows the steep area that would be suitable for the Proserpine rock wallaby as well as the extent of suitable surrounding and downstream habitat beyond that mine site for threatened species (Fig. 45).

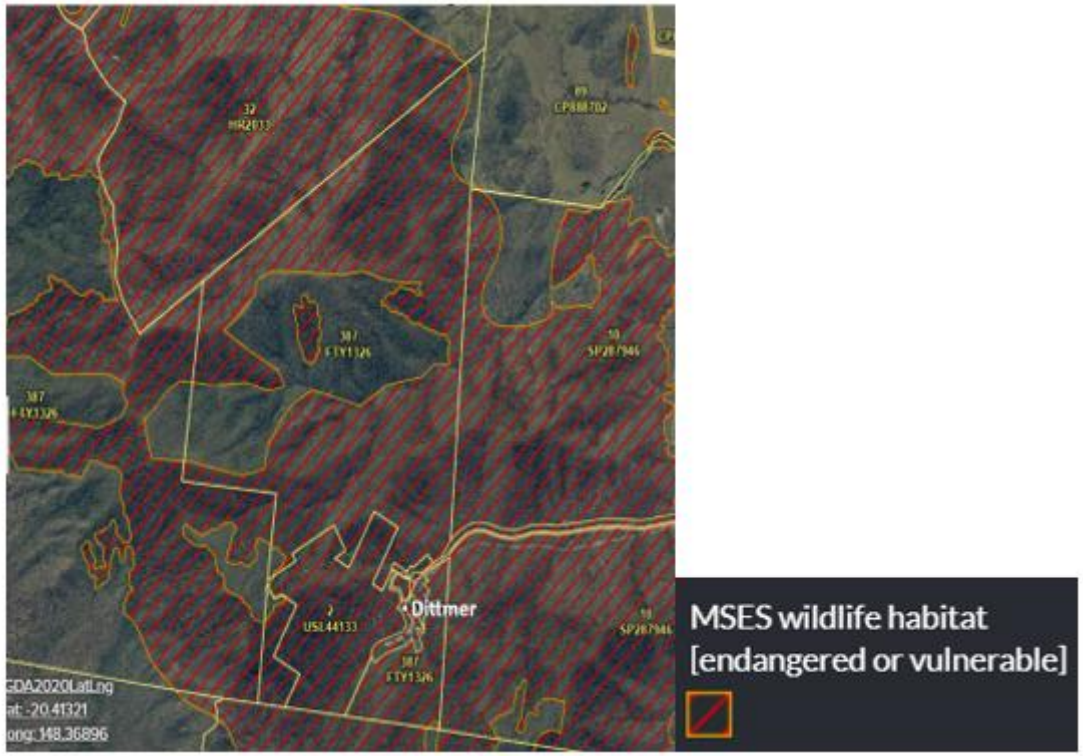


Fig. 44. Habitat for the Proserpine rock wallaby within the proposed Dittmer mine ML. (Source QGLOBE)

Fig. 45 Essential habitat for threatened species (yellow), elevation contours showing steeper terrain and the lot and plan for the Dittmer mine project (black circle).

The Recovery Plan for the Proserpine rock wallaby (PRW) maps essential habitat for this species in the northern section of Lot2 USL44133 where ML10341 and EPM 14225 are located (circled in black) (Fig.46) Recovery Plan and EPBC's SPRAT (Fig. 47(a) and (b)).

The Proserpine Rock Wallaby (PRW) uses large rock piles as refuge sites for protection against predators and to reduce the effects of high temperatures and humidity during the summer months. Colonies of between 15 and 30 PRWs inhabit the larger rock piles and when these areas are connected by continuous habitat, wallabies move between colonies (Johnson pers. comm. 2008).

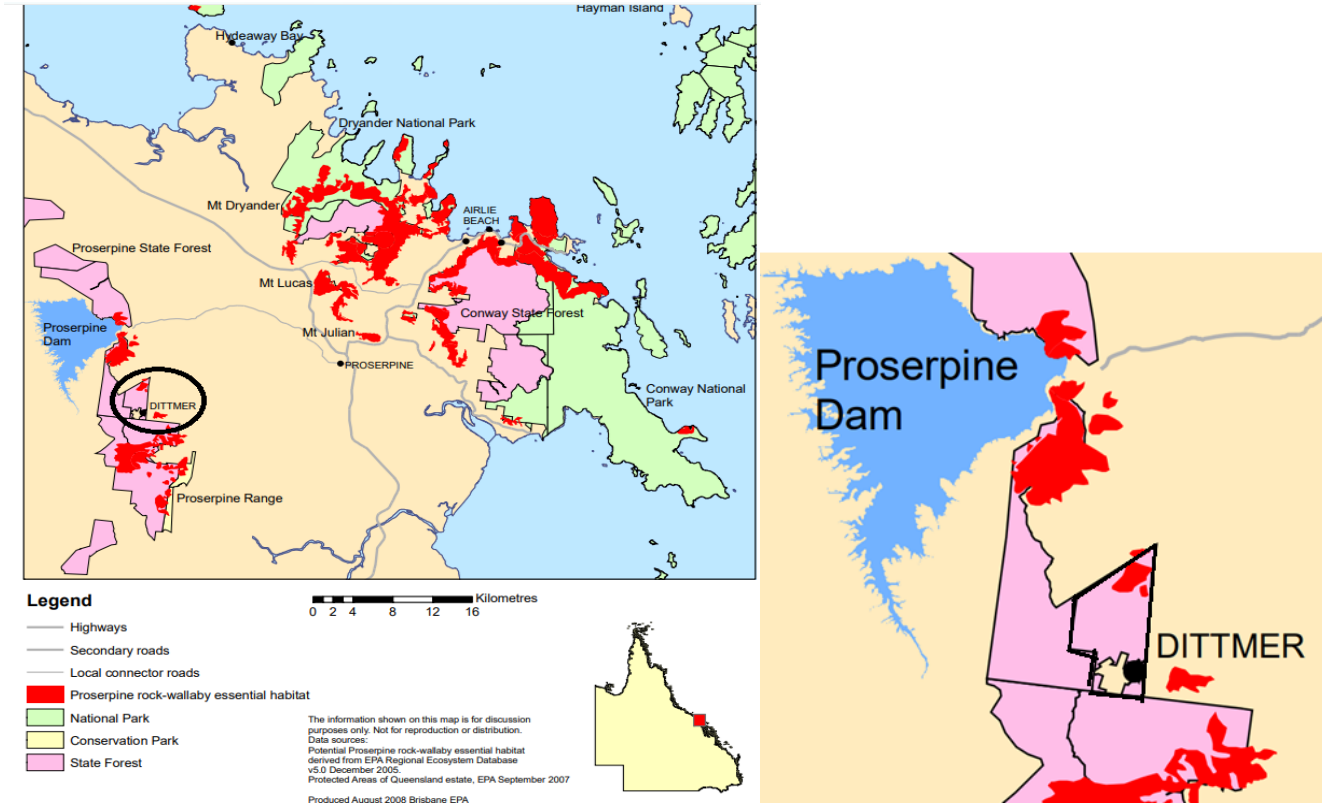


Fig. 46 Essential habitat for the Proserpine rock wallaby is within the Dittmer mine ML area (black outlined area). (Source: Proserpine rock wallaby Recovery Plan)

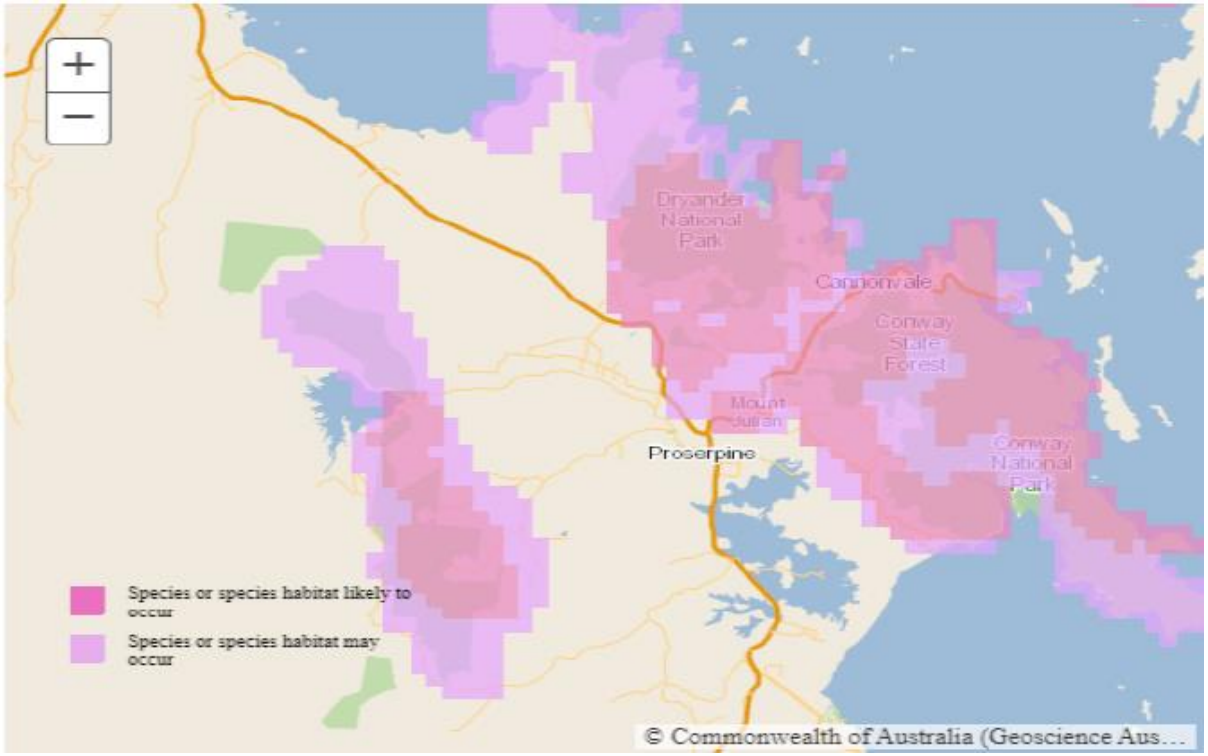


Fig. 47(a) PRW habitat likely or may occur (SPRAT DCCEEW)

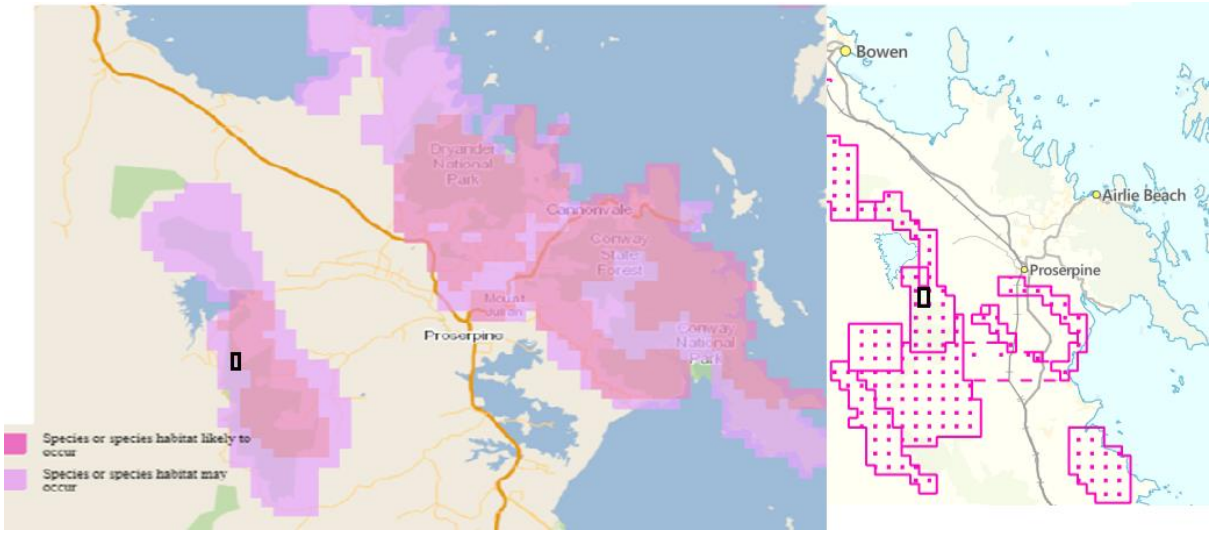


Fig. 47(b) Location of EPM 14225 (black rectangle) where PRW habitat is likley to occur in the Dittmer Mine Project (SPRAT DCCEEW) & (GEORESGLOBE)

The GEORESGLOBE maps (Figs. 46(c) and (d)) when enlraged show that EPM14225 is highly likely
to contain habitat for the Proserpine Rick wallaby which could be adverely impacted by the proposed Dittmer Mine Project.

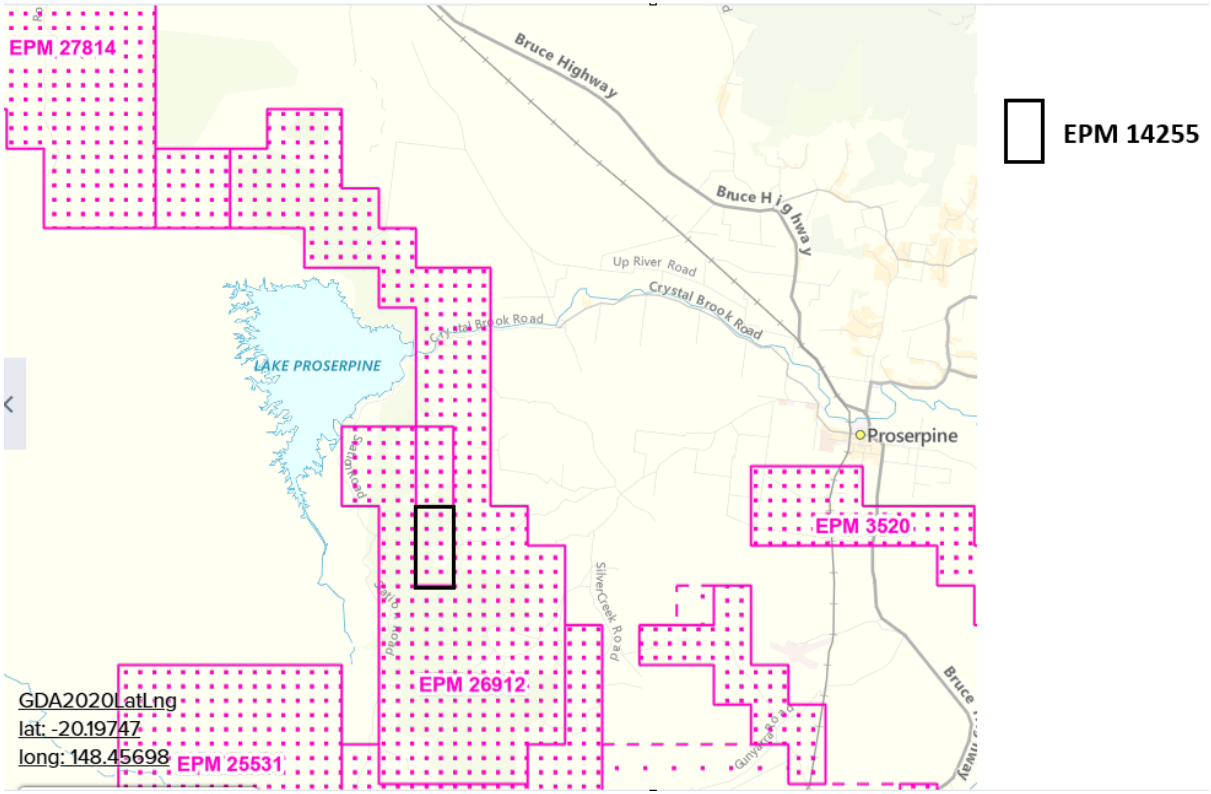


Fig. 47(c) EPM 14266 location (GEORESGLOBE)

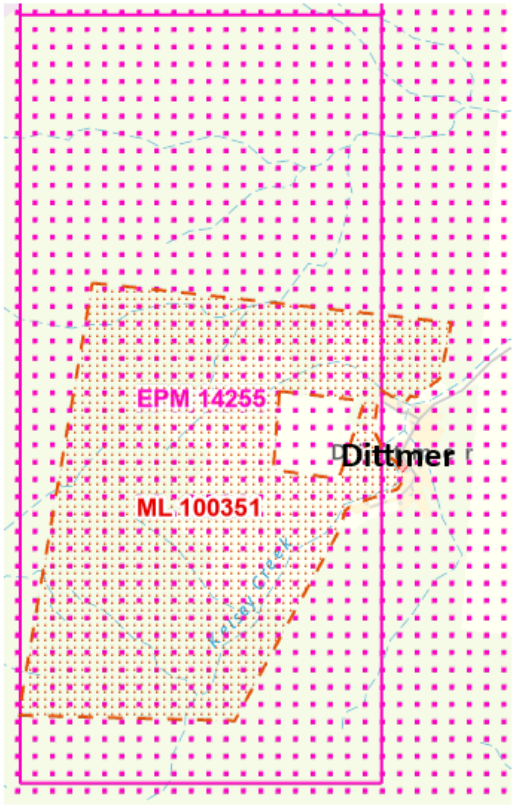


Fig. 47(d) ML 100351 Mineral Production within EPM 14255 Exploration Permit for Minerals (GEOREDGLOBE)

Rocky water courses also form a critical role both as a feeding area particularly during dry periods, and as a means of moving safely to and from feeding areas adjoining habitat.[56]

[56] The Recovery Plan for the Proserpine rock wallaby (PRW)

Such water courses also contain rock pools which can provide wildlife with a water supply through the dry months and support Proserpine Rock Wallabies and other fauna species throughout most years.[57] The impacts of underground mining on these water courses and their rock pools would need to be assessed.

There is a dense network of ephemeral creeks within **Lot2 USL44133** and the area has steep rocky slopes so concentrated field surveys in the Clarke Ranges in this area should reveal more disjunct Proserpine rock wallaby populations that could be affected by mining operations (Fig. 48(a) to 48(b)).

What impacts will the Ballimore Resources mining have on the planned mining of most of this ML? The tunnels will be underground, but there likely will be impacts on surface hydrology and habitats if subsidence or additional faulting occurs. How will groundwater be affected either from dewatering, and/or additional faulting affecting rainfall recharge and flows from the site into Kelsey Creek?

That should be addressed in an EPBC Referral on impacts on MNES as well as potential impacts from any noise, dust and water pollution.

[57] The Airlie Creek Track in Conway National Park is a trail that leads to natural rock pools and is home to the Proserpine rock wallaby. https://www.tourismwhitsundays.com.au/experience/the-airlie-creek-track/#:~:text=About%20The%20Airlie%20Creek%20Track,From%20Waterson%20Way%2C%20Airlie%20Beach.&text=To%20navigate%20the%20map%20with,navigate%2C%20press%20the%20arrow%20keys.

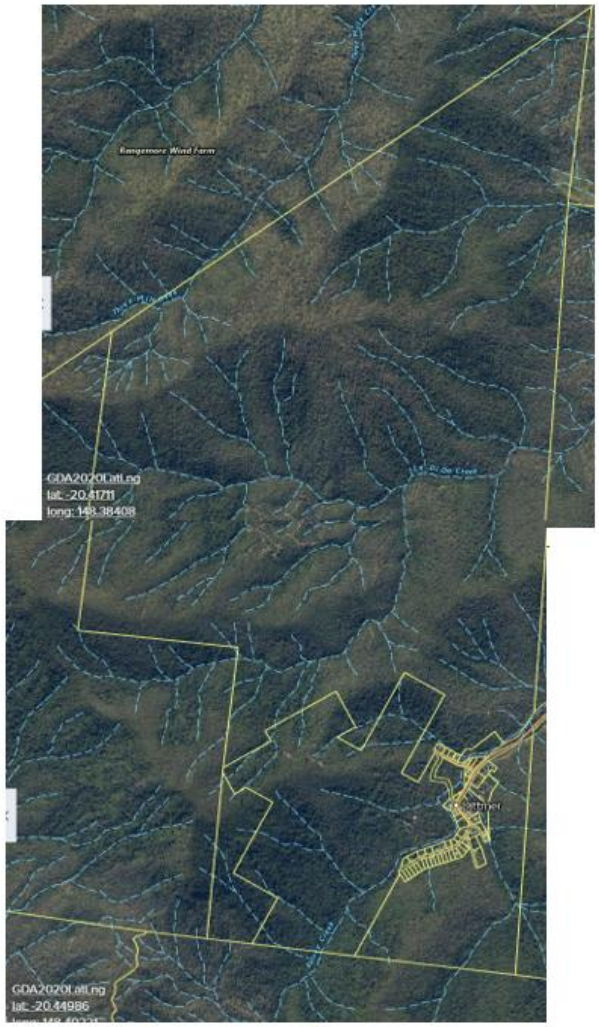


Fig. 48(a) dense network of ephemeral creeks within Lot2 USL44133 and part of 387 FTY1326 (Proserpine State Forest) where the Dittmer gold and copper mine MLA 100351 would be located

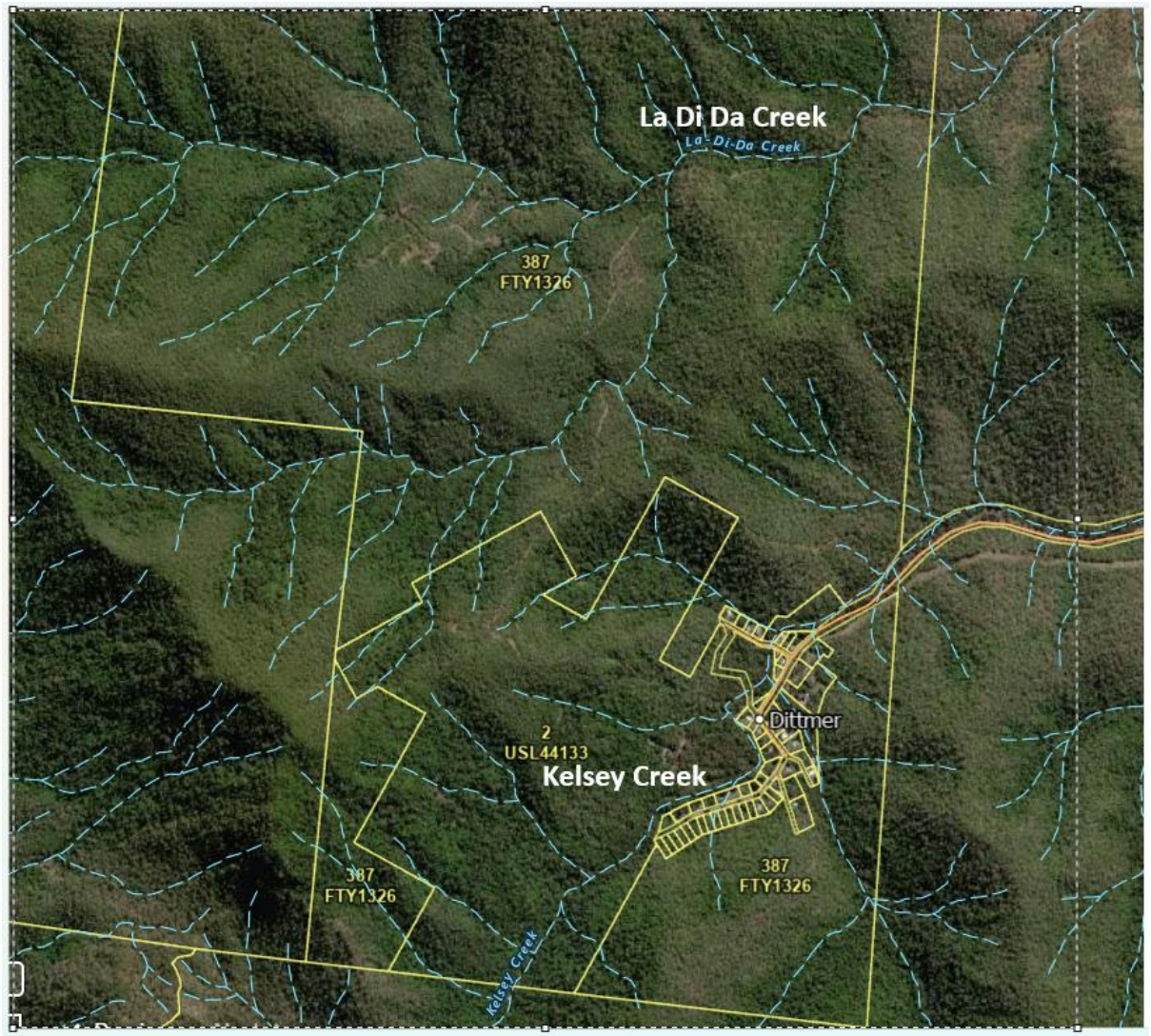


Fig. 48(b) Dense network of ephemeral creeks running off hills in MLA 100351 and rock pools would provide a water supply for the Proserpine rock wallaby and northern quoll and other fauna.

EPBC-listed Vulnerable koalas and what maybe the EPBC-listed Vulnerable Sharman's rock wallaby *Petrogale sharmani* are other threatened fauna that locals report are here. Genetic tests would be needed formally identify this wallaby species as it is outside its more northerly range.

The total population size of Sharman's rock wallaby is estimated at fewer than 800 mature individuals (Eldridge 2012). Surveying and monitoring is recommended in the conservation plan.

The koala (*Phascolarctos cinereus)* is now listed as Endangered under the EPBC Act.

The Greater glider (*Petauroides Volans*) (Vulnerable – EPBC)also moves through this area. The greater glider (southern and central) occurs in eastern Australia, where it has a broad distribution from around Proserpine in Qld, south through NSW and the ACT, to Wombat State Forest in central Victoria. The absence of records of greater gliders crossing highways or railways, despite glide poles being installed and monitored in multiple projects, suggest that they may be reluctant to cross near traffic

Locals also report that Kelsey creek is essential water supply for all these MNES.

The Northern Quoll (*Dasyurus hallucatus*)

Photo – Craig Ward

Fig. 49 The northern quoll

The Queensland Herbarium and EPBC Recovery Plan show that the Whitsunday area including the proposed mining area is a place where the northern quoll has been able to persist (Figs. 50(a) & (b)). This indicates that the higher elevation areas of the Whitsundays are refugia for this species and should be protected. This includes the proposed Ballymore Resources Dittmer ML.

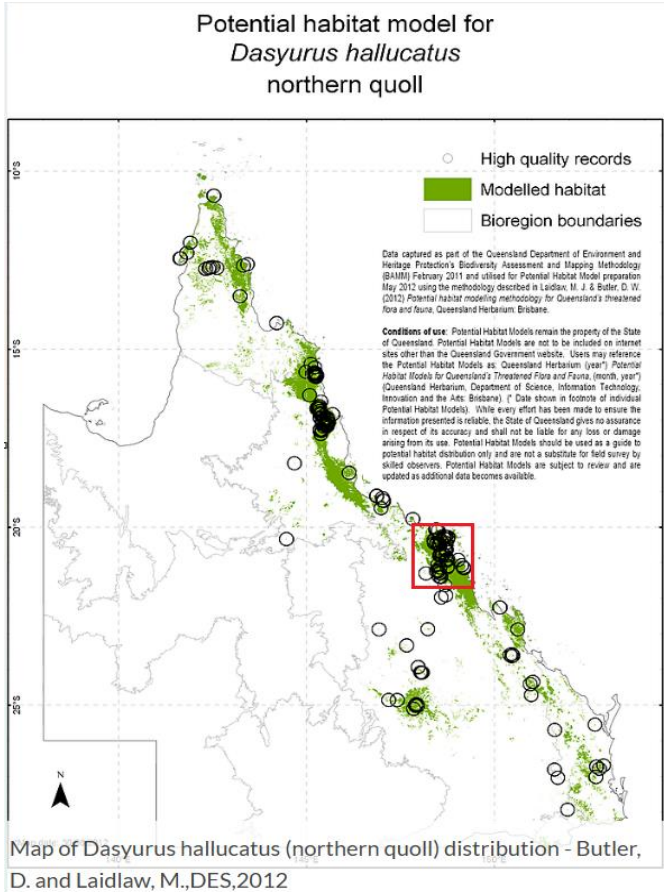


Fig. 50(a) High density modelled habitat for the Northern quoll (DES, 2012)

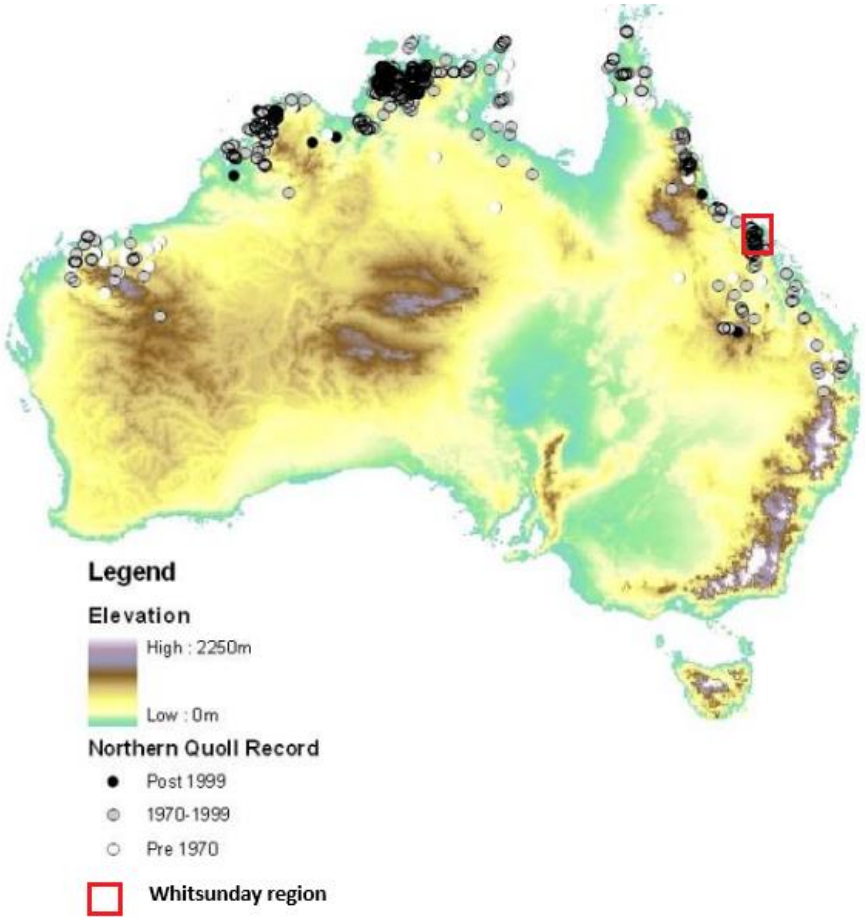


Fig. 50(b) Places where the northern quoll has been able to persist (EPBC Recovery Plan)

Rocky areas provide prime habitat for northern quolls (Begg 1981, Braithwaite and Griffiths 1994, DEWHA in prep.) and many other declining animal species (Freeland et al. 1988, Burbidge and McKenzie 1989). Recent modelling of island populations in the Northern Territory established that occurrence of northern quolls was related to ruggedness or topographic complexity (Woinarski et al. 2007). Analyses by Woinarski et al. (2008) show that northern quoll declines in Queensland have mainly been in lowland and flatter (less rugged) areas and a recent survey found the most abundant remnant populations on the Queensland coast were at sites with large boulders (Foster and Oakwood pers. comm. 2008). Rocky areas retain water and have a diversity of

microhabitats, so support higher floristic diversity and productivity and thus greater prey density and/or diversity compared to nonrocky adjacent country (Burnett 1997). In addition, cats forage less effectively in rocky areas. Their topographic complexity may also serve to ameliorate fire impacts, and they are typically not used for livestock production. Whilst rocky habitats support denser populations of quolls, the diverse and dispersed nature of rocky areas makes them very difficult to define or map on a national scale.[58]

The Recovery Plan states that populations that may be exposed to threats in the future but have the potential to persist (based on habitat, etc.) should be defined as part of the recovery process and need to be monitored and protected (page 5).

Inappropriate fire regimes, clearing, and habitat degradation are identified as threats to the northern quoll in its EPBC recovery plan.[59]

Fire may be the most likely threat to the northern quoll at the Dittmer mine expansion ML area as all the remnant reginal ecosystems are in place and there is extensive forest cover. In RE 8.12.3 which is present in all the ML.

> RE 8.12.3 Evergreen to semi-evergreen, notophyll to microphyll, vine forest to vine thicket of foothills and uplands on Mesozoic to Proterozoic igneous rocks

The detrimental impact of fire on quolls is likely to be through consequential changes in habitat structure and floristics (McKenzie et al. 2007). Too-frequent burning may reduce the abundance of food if there is insufficient time to allow prey species, predominantly invertebrates, to complete their life cycles. Mining activities present a risk of accidental fires.

Development for mining, housing, agriculture, etc., in areas of native vegetation within the distribution of the northern quoll is likely to result in clearing and loss of quoll habitat, particularly in rocky areas. While the mine is proposed to be underground ther will still need to be some clearing and certainly ongoing noise from mining operations will disturb this species.

[58] https://www.dcceew.gov.au/sites/default/files/documents/northern-quoll.pdf

[59] https://www.dcceew.gov.au/environment/biodiversity/threatened/recovery-plans/national-recovery-plan-northern-quoll-dasyurus-hallucatus-2010

Mining alters northern quoll habitat structure and likely influences northern quoll movement. Determining the impacts of mining on northern quoll movement has been listed as a priority for the species.[60] Summary of Cowan's findings on the impacts of mining in the Pilbara on this species:

> Northern quoll habitat use shifts seasonally: during the breeding season when quolls use more energy, they avoided mining habitats, but in the non-breeding season when quolls use less energy, they used mining habitats similarly to rocky and riparian habitats. Moving through mining habitats increased energy expenditure, likely driving avoidance during the energy-costly breeding season, and potentially affecting breeding dispersal.
>
> Mining landscapes significantly altered movement corridors and had reduced rocky habitat connectivity compared to the landscape without mining, driven by reduced availability of and longer distances between rocky habitat patches.
>
> Findings highlight the complex impacts of mining on wildlife and the need to consider community-level effects when undertaking management in mining landscapes.
>
> Mining has negative impacts on northern quoll fine-scale movement and energy expenditure, and is likely to have broader impacts on population-level dispersal and breeding success. The retention and conservation of rocky habitats and existing movement corridors will be important to allow northern quolls to persist efficiently in mining landscapes. Further findings support the incorporation of animal movement and landscape connectivity into future development planning
>
> Appendix G (Cowan):
>
> > Priorities related to all northern quoll populations, not restricted to the Pilbara and including Queensland research. These were:
> >
> > (i) resolving taxonomy,
> > (ii) clarifying the status of the Queensland northern quolls;
> > (iii) understanding mechanisms allowing the persistence and resistance of northern quoll populations during cane toad invasions;
> > (iv) quantifying the impacts of mining;

[60] Cowan, M. (2024). *Wildlife in mining landscapes: a case study of the endangered northern quoll (Dasyurus hallucatus)*. [Doctoral Thesis, Charles Sturt University]. Charles Sturt University.
https://researchoutput.csu.edu.au/en/publications/wildlife-in-mining-landscapes-a-case-study-of-the-endangered-nort
https://researchoutput.csu.edu.au/ws/portalfiles/portal/550138793/PhD_Thesis_Mitchell_Cowan_2024_Final.pdf

(v) investigating the threat of population isolation and the feasibility of genetic rescue;
(vi) unwinding interacting threats;
(vii) predicting the impact of climate change;
(viii) further incorporating Indigenous knowledge;
(ix) harnessing the heritability of toad avoidance behaviour; and

The EPBC Recovery Plan aims to minimise the rate of decline of the northern quoll in Australia and ensure that viable populations remain in each of the major regions of distribution into the future.

Will the proposed mining operations impact the habitats of this species within this ML?

Is this and area where quolls might be most likely to persist in the long term and if so can they be protected from mining impacts?

What management plan will be necessary for their protection from mining impacts?

Should the mine proceed?

Greater Glider Petauroides volans (Endangered) EPBC and NCA

Conservation status Petauroides volans (greater glider) is listed in the Vulnerable category of the threatened species list under the Environment Protection and Biodiversity Conservation Act 1999 (Cwth) (EPBC Act) effective from 5 May 2016.[61] Image Fig. 51.

The greater glider (southern and central) occurs in eastern Australia, where it has a broad distribution from around Proserpine in Qld, south through NSW and the ACT, to Wombat State Forest in central Vic (McGregor et al. 2020; B Arbogast & KN Armstrong et al. unpublished data; OZCAM records: Atlas of Living Australia 2021). It occurs across an elevational range of 0–1200 m above sea level (a.s.l) (Kavanagh 2004) (Fig. 52).

The greater glider (southern and central) is an arboreal nocturnal marsupial, predominantly solitary and largely restricted to eucalypt forests and woodlands of eastern Australia. It is typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows. It can occur in occurs in drier habitats in Qld.

[61] https://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-05072022.pdf

Petauroides volans © Copyright, Tyrie Starrs (from Tallaganda NSW)

Fig. 51 Greater glider

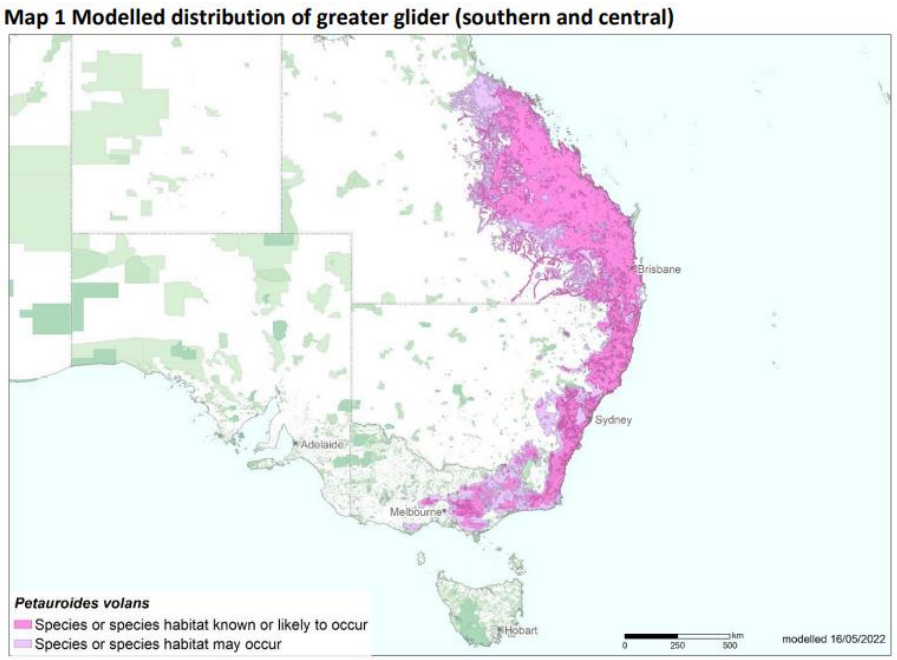


Fig. 52 Modelled distribution of the greater glider (SPRAT)

The probability of occurrence of the species is positively correlated with the availability of tree hollows (Andrews et al. 1994; Smith et al. 1994a,b; Lindenmayer et al. 2020), which is a key limiting resource.

The greater glider is particularly sensitive to forest clearance (Tyndale-Biscoe & Smith 1969a) and fragmentation.

They do not readily recolonise isolated sites from which they have been lost (Pope et al. 2004).

Dr. Patrick Norman did a study which mapped the distribution of major and lesser import glider corridors, and the following maps are derived from hi research.

The Dittmer mine project location is nest to and partly within Proserpine State Forest (Fig. 53(a).

It has a presence within woodlands in and around Proserpine State Forest and the Dittmer mine project area (Fig, 53(b)).

There is a Greater glider corridor of high importance (blue line) to the west of the Dittmer Mine Project. Corridors of moderate importance (yellow) are to the south and no corridor is present for most of the downstream riparian area. But the southern moderate corridor does trend northeast to the lower Proserpine River estuary. So, if toxics were to affect this species it would be close to the mine site or in the Goorganga wetlands or Proserpine estuary. They are following the higher topography and avoiding agricultural areas.

Fig, 53(a) Dittmer mine project ML location in Proserpine State forest

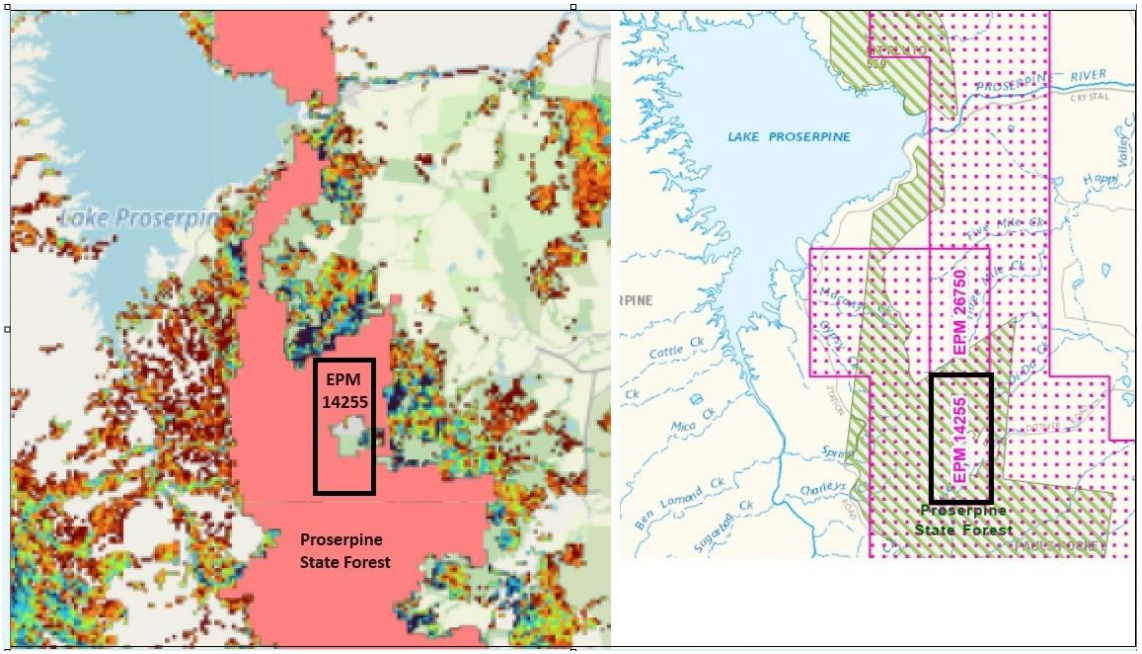


Fig. 53(b) Greater glider presence within woodlands in and around Proserpine State Forest and the Dittmer mine project area

There is a Greater glider corridor of high importance (blue line) to the west of the Dittmer Mine Project (Fig. 54). Corridors of moderate importance (yellow) are to the south and no corridor is present for most of the downstream riparian area. But the southern moderate corridor does trend northeast to the lower Proserpine River estuary. So, if toxics were to affect this species it would be close to the mine site or in the Goorganga wetlands or Proserpine estuary. They are following the higher topography and avoiding agricultural areas.

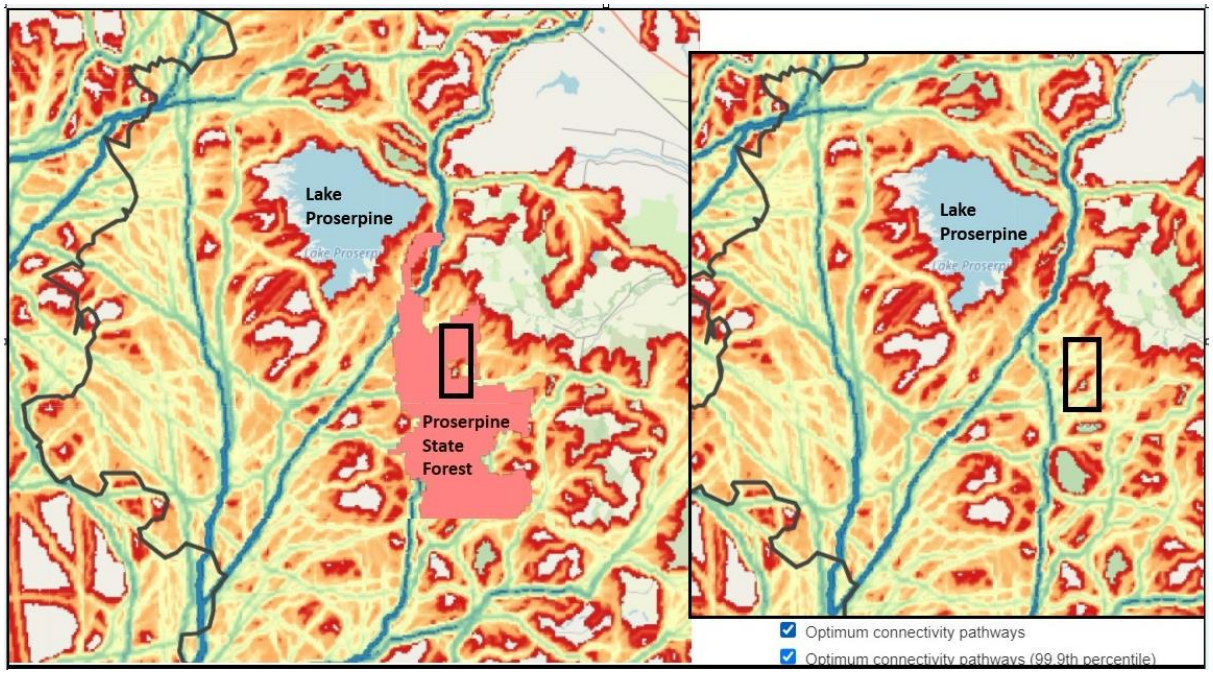


Fig. 54 Presence of an important greater glider corridor west of the ML and lesser corridors in the ML.

Downstream of the Dittmer ML there are lesser corridors to Mt Conway but they are not following the Kelsey and Lette Brook creek line vegetation and are farther south. (Fig. 55)). The connectivity corridor is a little further south.

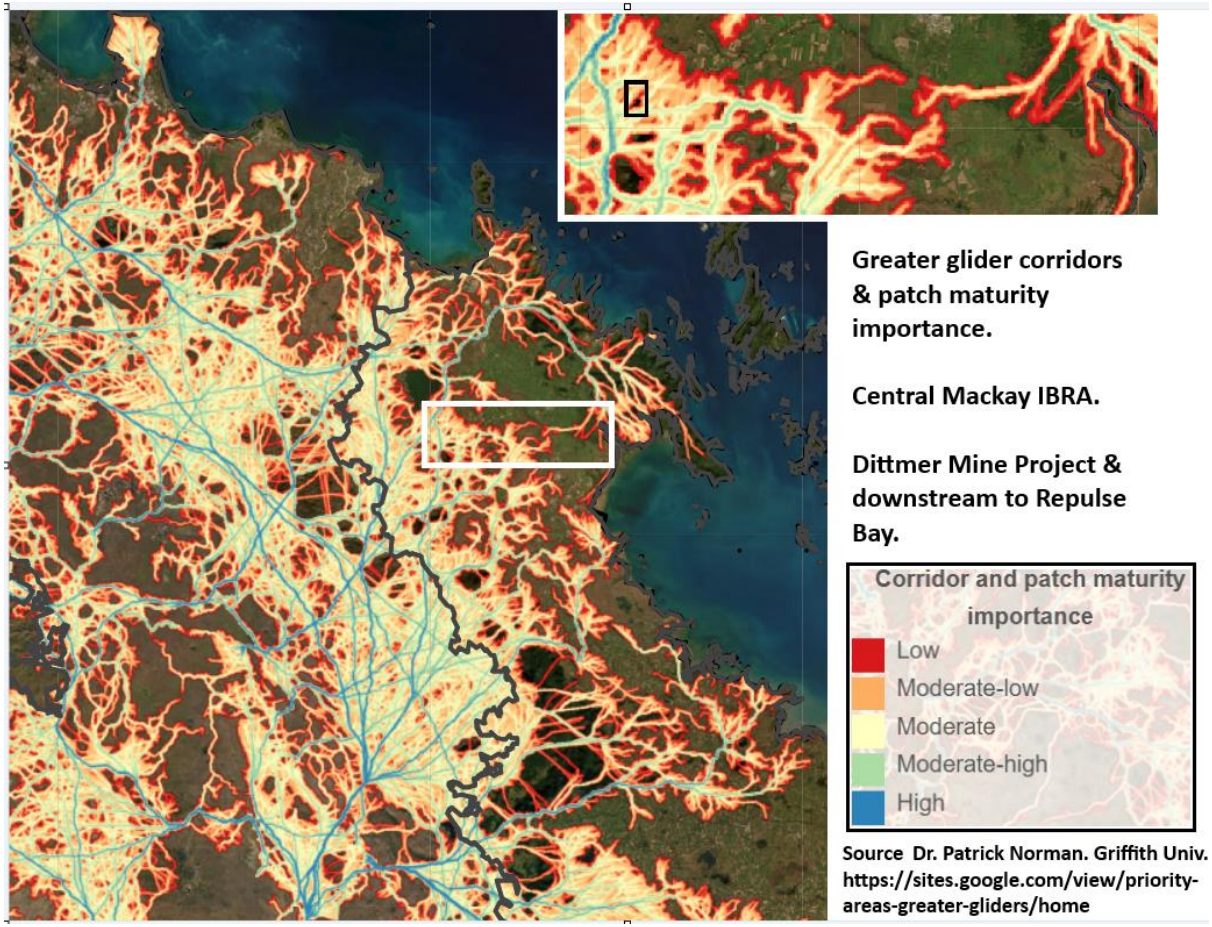


Fig.55 Greater glider corridors near the Dittmer mine project and within the downstream Goorganga wetlands near Mt. Conway.

The connection of the medium and lower connectivity corridors through Goorganga to Conway National Park to join a major corridor is shown in Fig, 56.

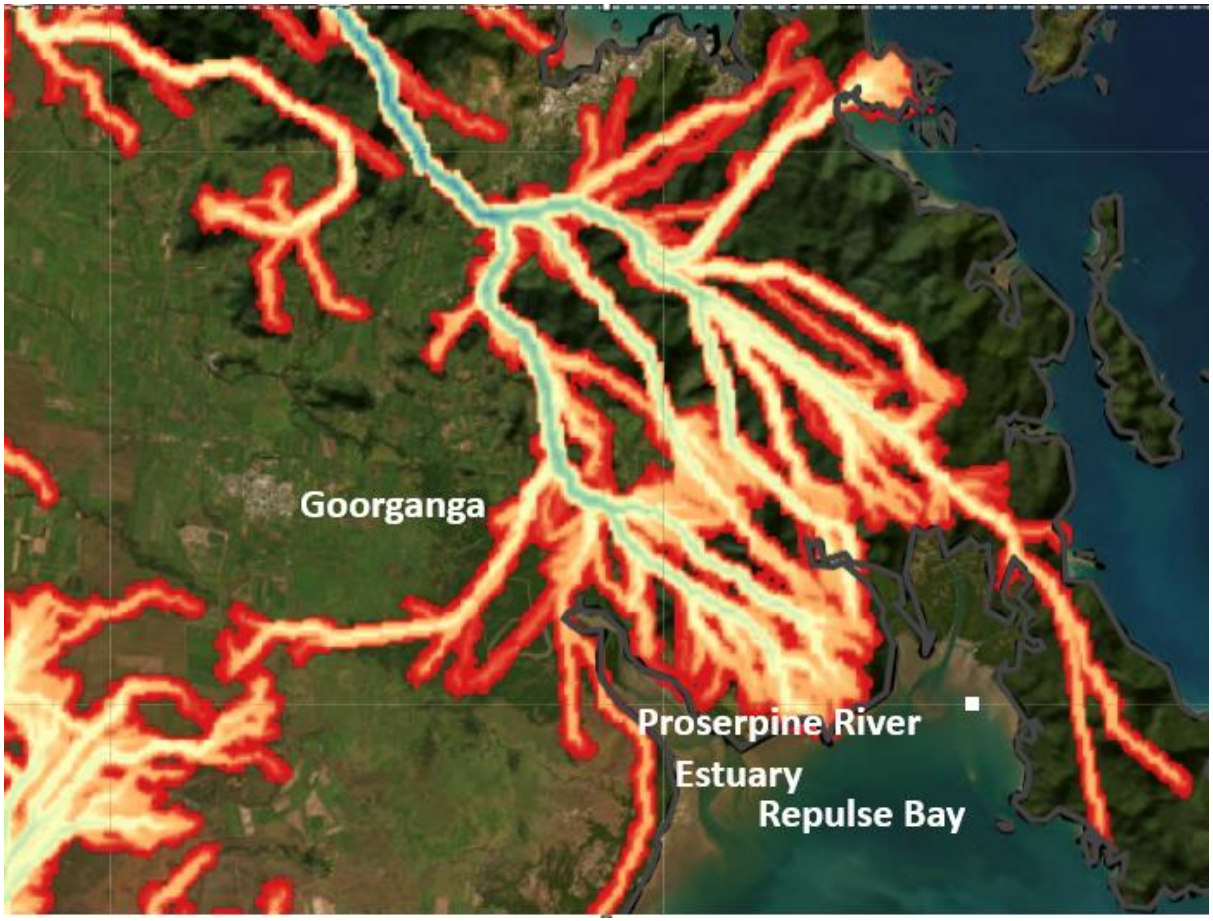


Fig. 56 Greater glider corridors (medium and low) within the downstream Goorganga wetlands to Conway National Park.

Proserpine-Goorganga nationally important Australian wetland (DIWA)

Fig. 57 Proserpine - Goorganga Plain DIWA nationally important wetland[62]

Elevation:	Less than 20 m ASL, most less than 10 m ASL.
Other listed wetlands in same aggregation:	None.
Wetland type:	A1, A5, A6, A7, A8, A9, B14, A11, B1, B4, B6, B10, A10
Criteria for inclusion:	1, 2, 3, 5,

The Proserpine Goorganga Plain Wetlands is listed in the Register of the National Estate as an Indicative Property.[63]

[62] https://www.environment.gov.au/cgi-bin/wetlands/report.pl?smode=DOIW&doiw_refcodelist=QLD050

[63] https://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=place_name%3DGoorganga%3Bstate%3DQLD%3Bkeyword_PD%3Don%3Bkeyword_SS%3Don%3Bkeyword_PH%3Don%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart;place_id=100442

Indicative means “Data provided to or obtained by the Heritage Branch has been entered into the database. However, a formal nomination has not been made and the Department has not prepared all the data necessary for a nomination.”

Under the Precautionary Principle given the possible significant impacts on this National Heritage place, even though its status is non-statutory, plus the many MNES present in these wetlands, including migratory bird species, impacts from the proposed upstream Dittmer gold and copper mine, should it decide to proceed, would need to be the subject of an EPBC Referral.[64]

Proserpine Goorganga Plain Wetlands, Bruce Hwy, Proserpine, QLD, Australia

Photographs	
List	Register of the National Estate (Non-statutory archive)
Class	Natural
Legal Status	Indicative place before RNE closed. Record for reference only, no statutory basis
Place ID	100442
Place File No	4/04/234/0013

Nominator's Statement of Significance
This area contains a very diverse mosaic of wetland types in good condition (Australian National Coastal Authority 1993). It supports the largest area of mangroves in the central Mackay coast region, some seventeen species having been recorded from the Proserpine River mouth alone (Estuaries inventory). The area is considered to be of national wetland importance (ANCA 1993) on the basis of a migratory bird habitat, its role in the natural functioning of habitats in the region and the rarity of this wetland type. It is therefore subject to international treaties regarding shorebirds and wetlands (Queensland Department of Environment and Heritage, Mackay, pers comm 1994). The area also provides known habitat for the vulnerable false water rat (XEROMYS MYOIDES).
Official Values Not Available
Description
NEW EDIT - The Proserpine-Goorganga Plain is the largest floodplain in the Central Queensland Coast Bioregion. The place occupies a significant part of a coastal

[64] https://www.dcceew.gov.au/environment/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance

floodplain and exhibits a continuity of very diverse array of high quality wetland habitats, including: shallow marine waters and tidal flats; beaches and minor swales; mangrove communities; supratidal flats; brackish water swamps; freshwater swamps, lakes and inundated grassland; seasonally flooded swamp forests; and riverine wetlands.

Two land systems of the Proserpine-Sarina Lowlands are represented within the nominated area, as identified by Thurgate and Maloney (1996). The first of these land systems is comprised of a large, flat to undulating coastal plain of alluvial and colluvial deposits, predominantly of a Quaternary age (<10,000 years ago), over older igneous basement rocks. This predominantly alluvial coastal plain merges with the Quaternary littoral deposits of coastal muds, silts and minor evaporites (salt deposits) along the coast. This system is characterised by flat to undulating littoral plains merging with coastal mud flats. Low linear ridges of up to 1.5 metres are also found in this land system and these features represent stranded beach ridges or old strandlines. The ridges landward from New Beach (northeast of the O'Connell River estuary) support a vegetation of melaleuca/eucalypt open-forest and coastal floodplain herblands. Modern coastal dunes and the beaches are also present.

As the Proserpine-Goorganga Plain wetlands(Fig. 54) are nationally important, any projects which may affect them must be subject to “wise use” assessment under the Ramsar Convention treaty.[65]

The three key elements of the definition of wise use are:

- **ecological character**, which is the combination of the ecosystem components, processes and benefits/services that characterise the wetland at a given point in time;
- **ecosystem approaches**, which consider the complex relationships between every element of an ecosystem, and promote the integrated management of land, water and living resources (including humans); and
- **sustainable development**, which is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for generations to come.

The Goorganga Plain wetlands complex extends south from Proserpine in central coastal Queensland. It is a vast area, consisting of approximately 16 850 hectares of seasonal wetlands, and recognised in the Directory of important wetlands in Australia. It is particularly significant because it consists of a diverse range of wetland ecosystems graduating from marine to freshwater environments. This wetlands complex has important ecological functions including floodwater detention, nutrient assimilation and sediment trapping. It provides habitats for rare and endangered plant and animal species, as well as valuable nursery habitats for many fish species.

[65] https://www.dcceew.gov.au/water/wetlands/publications/wise-use-wetlands-australia-fact-sheet#:~:text=Convention%20guidelines%20emphasise%20that%20'human,'&text=The%20three%20key%20elements%20of,also%20for%20generations%20to%20come.

It also hosts migratory bird species and large numbers of resident waterbirds. The area is both environmentally and economically valuable to the local community. The wetlands and surrounding areas support beef cattle, sugarcane and forestry as well as nearby residential land use.[66]

The Goorganga Plain is the largest floodplain in the Central Queensland Coast bioregion. It is notable for the extensive areas of seasonally inundated grassland. The overall site is particularly significant for the continuity and quality of habitats from marine to freshwater environments and the diversity of the biota.

The Goorganga wetlands are complex and date to the Quaternary and younger Holocene.. There are 87 regional ecosystems, 8 dominant regional ecosystems and 5 Wetland classes (Table 11)[67]

[66] https://wetlandinfo.des.qld.gov.au/resources/static/pdf/resources/tools/wetland-management-case-studies/epa09_026_web_case_studies_goorganga_v7.pdf

[67] Scott Hardy. Whitsunday regional Council. A PEDOGEOMORPHOLOGICAL ANALYSIS OF GOORGANGA WETLANDS TO ASSSIST WITH MANAGING THE AREAS ECOSYSTEMS. ISCO 2004 - 13th International Soil Conservation Organisation Conference – Brisbane, July 2004 Conserving Soil and Water for Society: Sharing Solutions.

Table 1. The results of the pedo-geomorphological unit – regional ecosystem data set intersection

Pedogeomor-phological class	US classification (Soil Survey Staff, 1992)	Geology	Total area (ha)	Area cleared (ha)	Number of Regional Ecosystems	Dominant Regional ecosystem	Wetland class
An	psamments	Qr	584	15	7	8.2.6a	A7
An3	psamments	Qr	52	10	6	8.3.13a	A7
Bh	Haplusterts	Qa	2256	1845	8	8.3.12	B4
Bv	Natraqualfs	Qa	216	213	0	8.3.5	
Cm	Aquic ustifluvents	Qa	506	483	2	8.3.12	B4
Cp	Hemists	Qm	148	83	3	8.3.12	
Dn	Aeric humaquepts	Qm	858	339	8	8.3.12	A8
Gi	Histic humaquepts	Qm	316	182	8	8.3.12	B4
Go	Hydraquentic sulfaquepts	Qm	4035	813	12	8.3.4 / 8.3.12	B4
Hs	Histic humaquepts	Qm	2483	456	10	8.3.12 / 8.3.4	B4
Mg	Histosols	Qm	4349	36	11	8.1.1	A9
Mu	Aquic ustifluvents	Qa	47	47	0	8.3.5	B4
My	Aeric humaquepts	Qa	316	214	4	8.3.12	B4
Po	Typic ustifluvents	Qa	479	77	2	8.3.1a	B4
Sa	Natraqualfs	Qa	279	57	3	8.3.12	B4
Sf	Hemists	Qm	736	54	7	8.1.3	A7
St	Oxyaquic ustifluvents	Qa	243	243	0	0	B4
Sw	Fibrists	Qm	1541	294	8	8.3.4	B10
Vc	Haplusterts	Qa	121	98	1	8.3.4	B4
Total		3	19460	6139	97	8	5

Table 11 Regional ecosystems, and wetland classes of the Goorganga wetlands (Scott Hardy Whitsunday Regional Council).

There are at least 23 EPBC Threatened Listed Species[68] (Table 12)

[68] https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wildlife/?AreaID=diwa-wetland-proserpine-goorganga-plain

Mammals

Family	Scientific Name	Common Name		NCA	EPBC	End.	Wetland
Muridae	Xeromys myoides	water mouse		V	V	QAI	I
Macropodidae	Petrogale persephone	Proserpine rock-wallaby		E	E	Q	
Pseudocheiridae	Petauroides volans volans	southern greater glider		E	E	QA	
Phascolarctidae	Phascolarctos cinereus	koala		E	E	QA	
Dasyuridae	Dasyurus hallucatus	northern quoll		C	E	QA	

Reptiles

Family	Scientific Name	Common Name	Superseded	NCA	EPBC	End.	Wetland Status
Cheloniidae	Chelonia mydas	green turtle		V	V	QAI	

The saltwater crocodile (*Crocodylus porosus*) is listed as Marine; Migratory (EPBC Act, Bonn)

Birds

Family	Scentific Name	Common Name		NCA	EPBC	End.	Wetland
Scolopacidae	Arenaria interpres	ruddy turnstone		SL	V	QAI	I
Scolopacidae	Calidris acuminata	sharp-tailed sandpiper		SL	V	QAI	I
Scolopacidae	Calidris canutus	red knot		E	V	QAI	I
Scolopacidae	Calidris ferruginea	curlew sandpiper		CR	CE	QAI	I
Scolopacidae	Calidris tenuirostris	great knot		CR	V	QAI	I
Scolopacidae	Gallinago hardwickii	Latham's snipe		SL	V	QAI	I
Scolopacidae	Limosa lapponica baueri	Western Alaskan bar-tailed godwit		V	E	QAI	I
Scolopacidae	Limosa limosa	black-tailed godwit		SL	E	QAI	I
Scolopacidae	Numenius madagascariensis	eastern curlew		E	CE	QAI	I
Scolopacidae	Tringa nebularia	common greenshank		SL	E	QAI	I
Scolopacidae	Xenus cinereus	terek sandpiper		SL	V	QAI	I
Rostratulidae	Rostratula australis	Australian painted-snipe		E	E	QA	I
Charadriidae	Charadrius leschenaultii	greater sand plover		V	V	QAI	I
Charadriidae	Charadrius mongolus	lesser sand plover		E	E	QAI	I
Charadriidae	Pluvialis squatarola	grey plover		SL	V	QAI	I
Apodidae	Hirundapus caudacutus	white-throated needletail		V	V	QAI	
Columbidae	Geophaps scripta scripta	squatter pigeon (southern subspecies)		V	V	QA	

EPBC - Status under the Environment Protection and Biodiversity Conservation Act 1999

EX : Extinct
XW : Extinct in the wild
CE : Critically endangered
E : Endangered
V : Vulnerable
CD : Conservation dependent

Table 12. Twenty-three EPBC Threatened Listed Species in the Proserpine-Goorganga DIWA.

The Goorganga Wetlands are downstream of Dittmer via Kelsey, and Lethe Brook Creeks and the lower Proserpine River, then Repulse Bay (Fig. 58). Any adverse impacts of the proposed Dittmer Mine Project could extend to these wetlands and potentially as far as Repulse Bay and the Great Barrier Reef.

Such potential impacts and the level of risk of such impacts occurring need to be identified, evaluated, and assessed as part of a robust Environmental Authority permit application processes

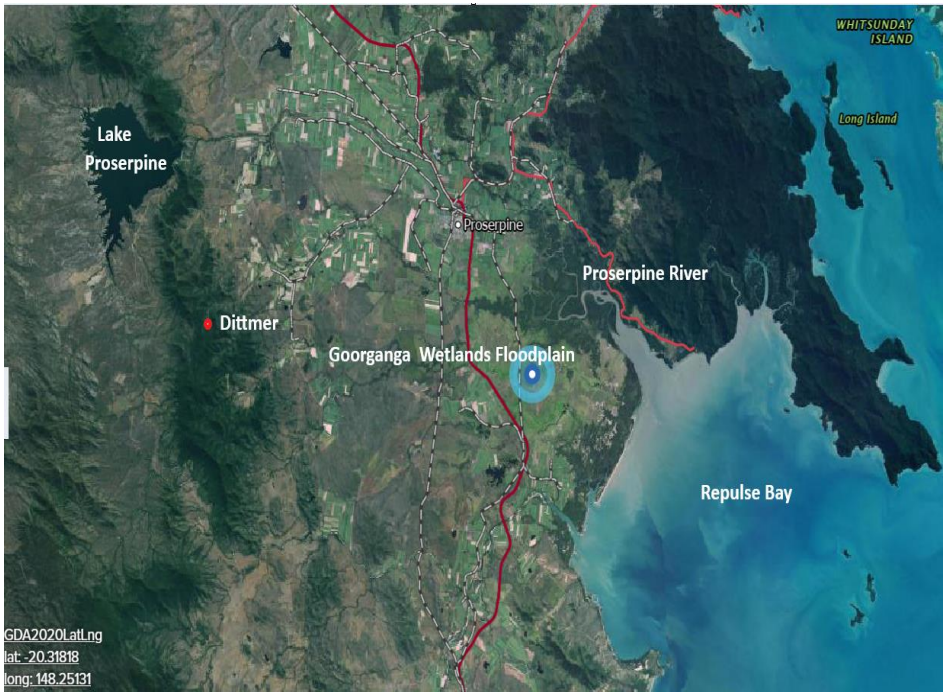


Fig. 58 Proserpine-Goorganga Plain wetlands in relation to Dittmer and Repulse Bay

RAMSAR Convention Requirements under the EPBC Act 1999

As a signatory to the Convention on Wetlands of International Importance (known as the Ramsar Convention 1971) , Australia is required to develop descriptions of the ecological character for each DIWA site, maintain that character and notify the Convention of any changes.

The documents can be used to:

- assess changes in the ecological character of the site
- design a monitoring program to detect changes in ecological character
- develop and implement a management plan to maintain the ecological character of the site

- assess the likely impact on ecological character of proposed actions as required under the *Environment Protection and Biodiversity Conservation Act 1999*.

Comment: The Environmental Authority has no requirement for Ballymore Resources Pty. Ltd. to investigate any risk of polluted groundwater downstream flows from the Dittmer mine project in the Clarke Range into the Goorganga flood plain and the GBR

Increases in rainfall intensity are predicted

CSIRO reports that East coast lows and cyclones are predicted by BoM to become less frequent but more intense as climate change proceeds. Such events would increase rainfall runoff and groundwater recharge, erosion rates and flooding especially when they remain stationary for longer periods than in the past. This could increase the risk of toxic pollutants leaving the mining site and entering waterways and causing downstream pollution and environmental harm potentially as far as the GBRWHA.

Faulting Impacts

Depending on the number of faults within the proposed extended underground mine tunnels, there may be a significant flow of any polluted groundwater from the mine site to the Great Barrier Reef via paleochannels as well as surface flows during the life of the expanded mine and possibly for many hundreds of years or more after its closure.

Earthquakes can affect existing fault lines and contribute to an increase in faulting

Earthquake risk in the Whitsunday Region is high in Queensland terms, moderate in Australian terms and low in global terms (Fig. 59(a)). On 18 August 2016 at 2.30pm the second largest earthquake on record in Queensland of 5.8 magnitude occurred just offshore within the Whitsunday Region, about 50 kms from Bowen. This earthquake was felt across the entire Whitsunday Region and large amounts of Queensland and was followed by over fifty (50) aftershocks.

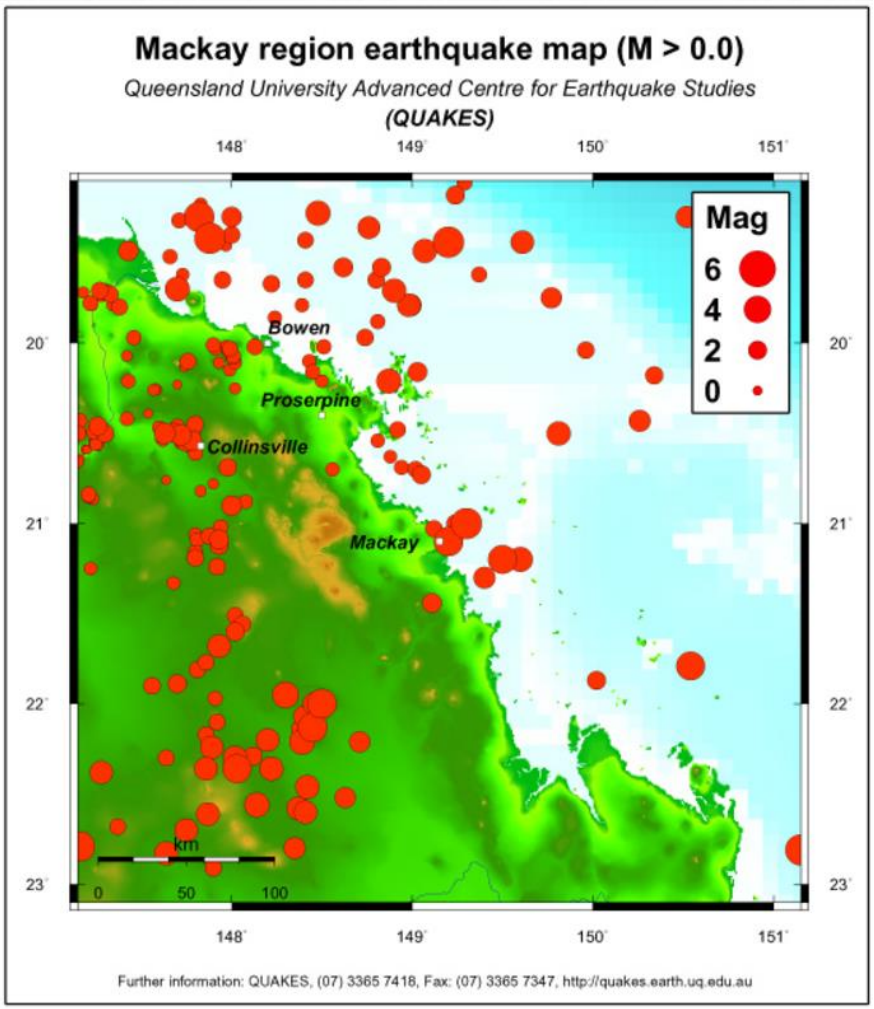


Fig. 59(a) Earthquakes in the Mackay Whitsunday region.[69]

[69] https://quakes.uq.edu.au/quakeinfo-mackay.html

Landowners report that tremors are felt frequently in Eungella which like the Dittmer mine project is in the Clarke Range.

On 16 April 2011, a significant 5.3 magnitude earthquake occurred west of Bowen and was widely felt across the Whitsunday Region, this is one of the ten (10) largest earthquakes on record in Queensland.[70]

Most of these earthquakes occur offshore where a swarm that have occurred over the last decade is apparent in (Fig. 59(b)).

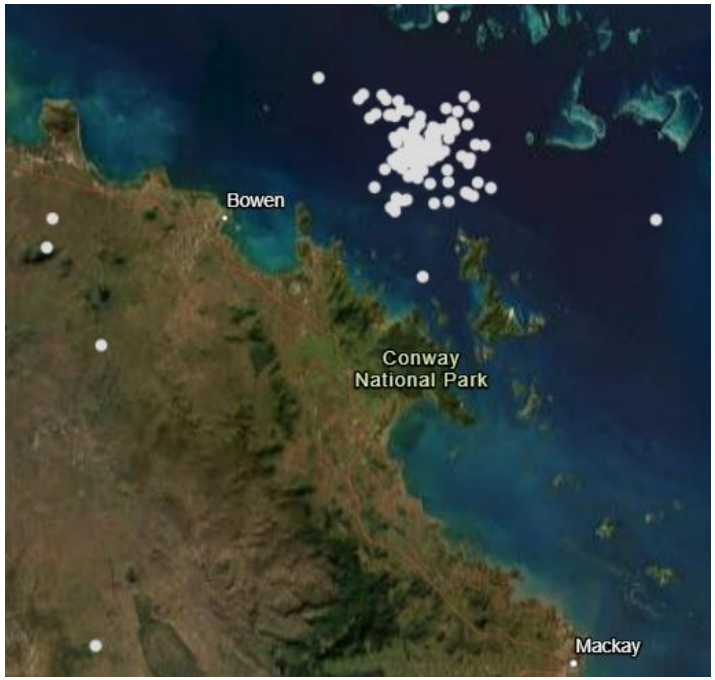


Fig. 59(b). Earthquakes in the Whitsunday region in the last 10 years[71]

[70] https://www.whitsundayrc.qld.gov.au/our-council/disaster-and-emergency/prevention

[71] **https://earthquakes.ga.gov.au/**

Toxics in groundwater

Toxic waste from gold mines can contaminate water sources with dangerous chemicals like arsenic, lead, mercury, and cyanide.

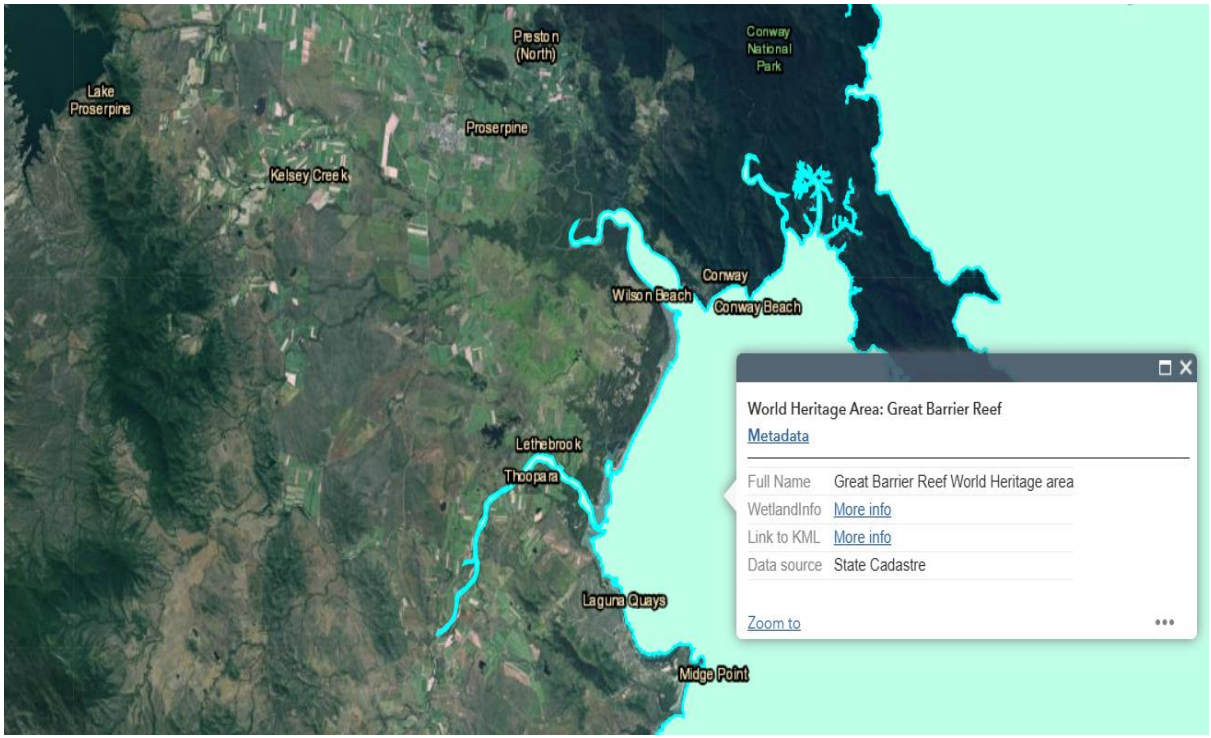
Polluted groundwater could flow through paleochannels from the Clarke Range to the coastal wetlands and the Great Barrier Reef. The presence of such fresh groundwater upwelling within Repulse Bay and the GBR is evidenced by “wonky holes” (Appendix II). These are known all along the Queensland coast offshore from the mouths of large coastal rivers. They are favoured by fishermen because they are rich in nutrients and attract plenty of fish. This area is also mapped as the Repulse Bay Fish Habitat Area.

The Whitsunday Conservation community requests that there be an EPBC Referral by Ballymore Resources on the Dittmore gold mine proponent to fully assess mining impacts onsite and downstream. This Referral would be to address the level of risk of this potential pollution source to determine whether it poses a long-term contamination risk to the Goorganga wetlands and its EPBC-listed wildlife, as well as being likely to have any adverse impacts on the Outstanding Universal Values of the offshore Great Barrier Reef.

Repulse Bay

The Great Barrier Reef World Heritage Area borders the coast in Repulse Bay.

Any contaminants from the Dittmer mine project that reach the coast would flow into Repulse Bay and the GBRWHA via the Proserpine River estuary (Fig. 60).



Fig, 60 Repulse Bay section of the Great Barrier Reef World Heritage Area

Repulse Bay has several MNES as well as a class A Fish Habitat Area (Fig. 60(a)) & (b)).

Fig. 61(a) Class A Fish Habitat Area Repulse Bay (WetlandInfo)

Fig. 61(b) Class A Fish Habitat Area Repulse Bay (QGLOBE)

Fish Habitat Area Repulse Bay[72]

Size 69,496 ha

Management level A

Management features

Habitat conservation for fish and prawn stocks; protection of fishing grounds.

Habitat values

Mangrove-dominated floodplain (*Rhizophora*, *Acanthus*, *Acrostichum, Avicennia* and *Ceriops* species are common); mangrove-lined creeks; intertidal flats; seagrass beds around the mouth of Repulse Creek.

Fisheries values

Commercial, recreational and Indigenous fishing; barramundi; blue salmon; bream; estuary cod; flathead; grey mackerel; grunter; mangrove jack; queenfish; school mackerel; whiting; banana prawns.

Unique features

Lies within the Great Barrier Reef World Heritage Area, the St Helens Beach to Cape Hillsborough net-free fishing zone and Repulse Bay dugong protection zone.

Threatened animal species and one land plant species in Repulse Bay Class A Fish Habitat Area (Table 13)[73]

[72] https://parks.desi.qld.gov.au/management/managed-areas/fha/area-plans/repulse

[73] WetlandsInfo search Repulse Fish Habitat Area 17/11/2024

Class	Family	ScientificName	CommonName	EPBC	Endemicity	Wetland Status
mammals	Muridae	Xeromys myoides	water mouse	V	QAI	I
mammals	Megadermatidae	Macroderma gigas	ghost bat	V	QA	
mammals	Macropodidae	Petrogale persephone	Proserpine rock-wallaby	E	Q	
mammals	Phascolarctidae	Phascolarctos cinereus	koala	E	QA	
mammals	Dasyuridae	Dasyurus hallucatus	northern quoll	E	QA	
birds	Scolopacidae	Arenaria interpres	ruddy turnstone	V	QAI	I
birds	Scolopacidae	Calidris acuminata	sharp-tailed sandpiper	V	QAI	I
birds	Scolopacidae	Calidris canutus	red knot	V	QAI	I
birds	Scolopacidae	Calidris ferruginea	curlew sandpiper	CE	QAI	I
birds	Scolopacidae	Calidris tenuirostris	great knot	V	QAI	I
birds	Scolopacidae	Limosa lapponica baueri	Western Alaskan bar-tailed godwit	E	QAI	I
birds	Scolopacidae	Limosa limosa	black-tailed godwit	E	QAI	I
birds	Scolopacidae	Numenius madagascariensis	eastern curlew	CE	QAI	I
birds	Scolopacidae	Tringa nebularia	common greenshank	E	QAI	I
birds	Scolopacidae	Xenus cinereus	terek sandpiper	V	QAI	I
birds	Charadriidae	Charadrius leschenaultii	greater sand plover	V	QAI	I
birds	Charadriidae	Charadrius mongolus	lesser sand plover	E	QAI	I
birds	Charadriidae	Pluvialis squatarola	grey plover	V	QAI	I
birds	Apodidae	Hirundapus caudacutus	white-throated needletail	V	QAI	
birds	Columbidae	Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	QA	
reptiles	Cheloniidae	Chelonia mydas	green turtle	V	QAI	
reptiles	Cheloniidae	Eretmochelys imbricata	hawksbill turtle	V	QAI	
reptiles	Cheloniidae	Natator depressus	flatback turtle	V	QAI	
land plants	Acanthaceae	Graptophyllum ilicifolium	holly-leaved graptophyllum	V	Q	

Table 13 EPBC threatened species in Repulse Bay Class A Fish Habitat Area

Other values

Protection of dugong (Fig. 62) and marine turtle habitat (Fig. 63).

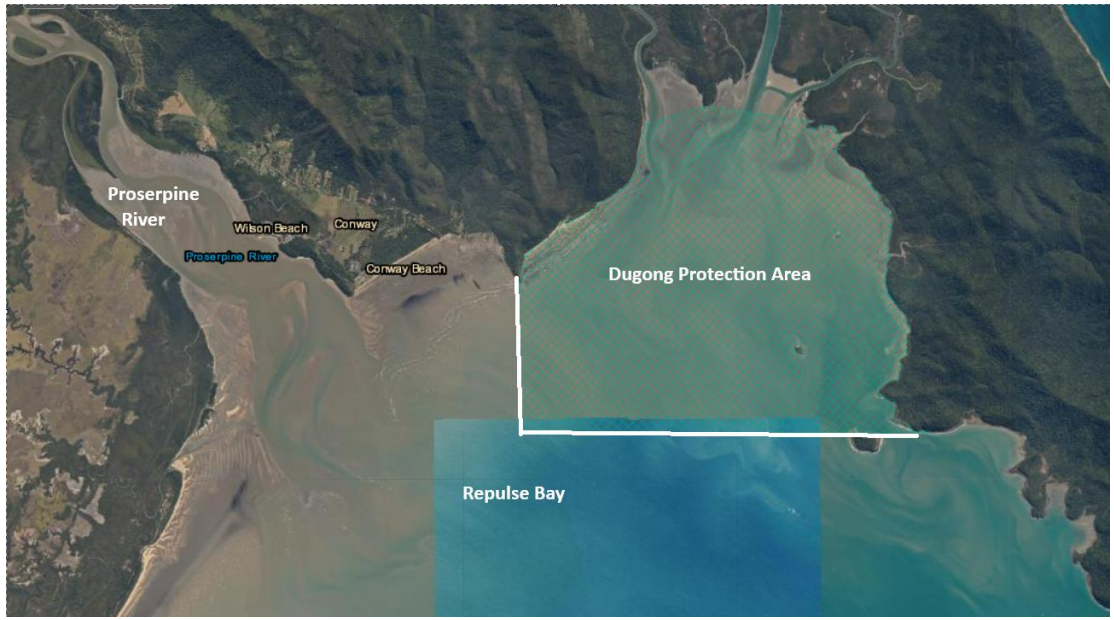


Fig. 62 Dugong Protection Area

Fig. 63 Locations (bright blue) of the Sea Turtle nesting areas along New Beach north and south of the Proserpine River estuary (QGLOBE). Nests noted at the toe of the dune.

The following table 14 lists EPBC-listed sea turtle species associated with the Proserpine River drainage sub-basin. This area provides nesting habitat for four of the six sea turtle species in Queensland,

Class	Family	ScientificName	CommonName	EPBC	Endemicity
reptiles	Cheloniidae	Caretta caretta	loggerhead turtle	E	QAI
reptiles	Cheloniidae	Chelonia mydas	green turtle	V	QAI
reptiles	Cheloniidae	Eretmochelys imbricata	hawksbill turtle	V	QAI
reptiles	Cheloniidae	Natator depressus	flatback turtle	V	QAI

Table 14 Sea Turtle species in the Proserpine River drainage sub-basin.[74]

This region is a part of the Great Barrier Reef Marine Park and the Great Barrier Reef Coast Marine Park (Fig.64)

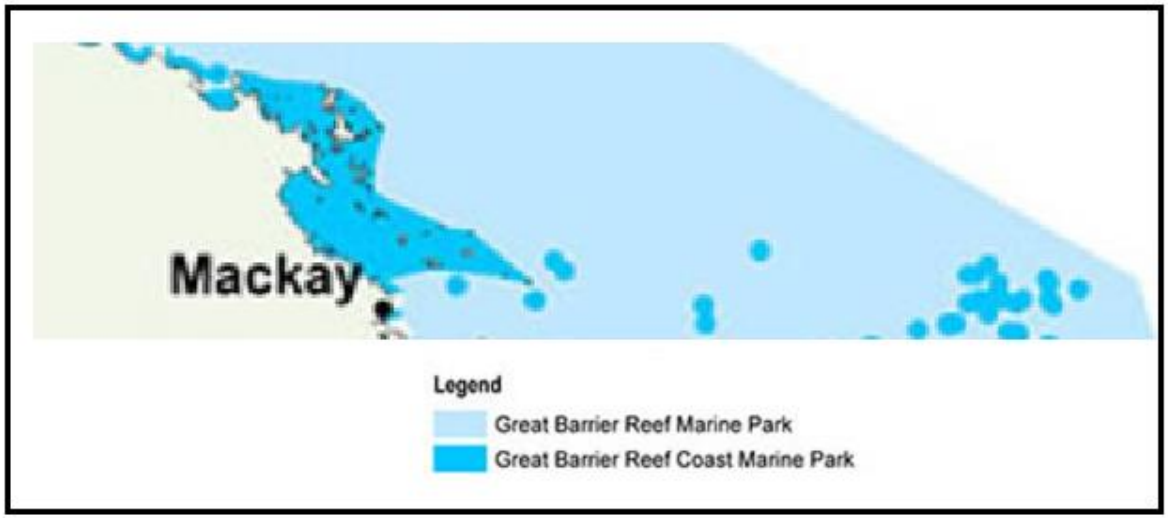


Fig. 64 This region is a part of the Great Barrier Reef Marine Park and the Great Barrier Reef Coast Marine Park

[74] https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wildlife/?AreaID=sub-basin-proserpine-river

The Great Barrier Reef Marine Park Authority zones the Proserpine estuary and near shore as General Use (light blue), Repulse Bay National Marine Park Zone (dark green) and Repulse Islands National Park as a Habitat Protection Zone (darker blue). They are all in the Great Barrier Reef World Heritage Area (Fig. 65).

The Proserpine River is one of two major rivers whose catchment influences the coral reefs of the Whitsunday Islands.[75]

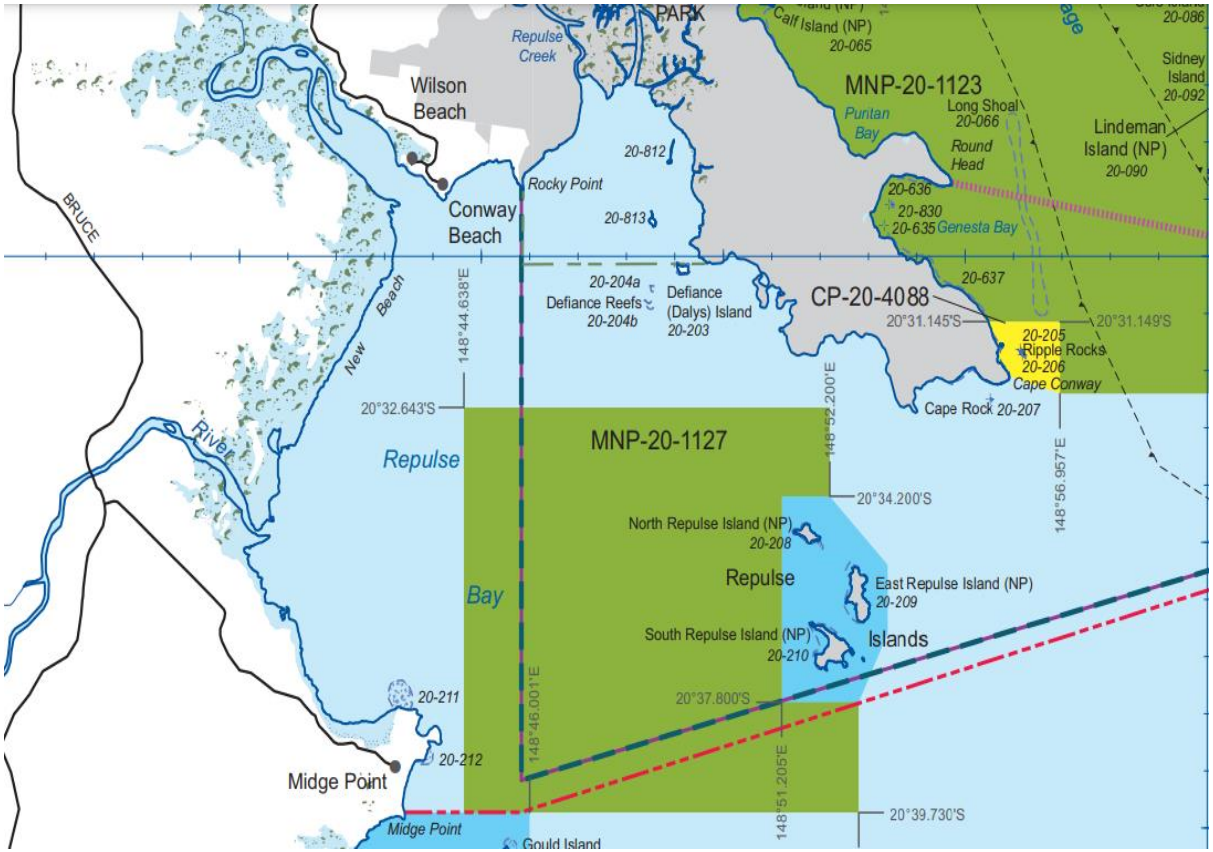


Fig.65 Repulse Bay National Marine Park: Habitat Protection. **Great Barrier Reef Marine Parks Zoning: Whitsunday Group**

[75] Wikipedia. Article on the Proserpine River.

There are no EPBC-listed species recorded in Repulse Islands National Park in Wetlands Info.

Nesting seabirds are found on all three islands. The islands and surrounding waters are protected by the Great Barrier Reef World Heritage Area.

But the GBRWHA is part of Australia's National Reserve System of Protected Areas and any actions that would diminish its Outstanding Universal Values is not permitted. That would include mining in adjacent catchments that could pollute its waters.

The *Environmental Protection (Great Barrier Reef Protection Measures) and Other Legislation Amendment Act 2019* was passed by Queensland Parliament on 19 September 2019 and new Reef protection regulations commenced on 1 December 2019.

The new Reef protection regulations address land-based sources of water pollution to the Great Barrier Reef, including industrial and agricultural sources of nutrient and sediment pollution from all 6 Reef regions

While the main source of water pollution is agriculture, the Reef 2050 WQIP includes a diverse set of actions and recognises urban and industrial areas can create concentrated pollution that has important local impacts. It includes targets for improving water quality leaving the catchments to help prioritise actions.[76] But these reforms address agricultural pollution for the most part.

Toxics pollution prevention of the GBRWHA from mining operations near the GBR coastline appears to be handled by the DESI assessment process via the Environmental Authorities.

The Environment Protection and Biodiversity Conservation Act 1999, protects nationally significant matters including the Reef World and National Heritage areas.

There is little public information on policies covering industrial pollutants in the Great Barrier Reef from coastal mining activities other than what is in the QLD Environmental Pollution Act, and its policies and regulations.

Sediment Plumes

Any Dittmer mining pollutants in runoff could reach the Great Barrier Reef via flood plumes from large runoff events during wetter wet seasons.

Rainfall in December 2010 in the Whitsundays ranged between 300-400 per cent of the mean (Fig. 66) and although the sediment plumes from the Proserpine River estuary are lower than from far north Queensland between the Burdekin River estuary and Cairns, sediment plumes are still substantial. As

[76] https://www.reefplan.qld.gov.au/water-quality-and-the-reef

rainfall intensity and volumes increase under climate change, there is a higher risk of runoff and high sediment and pollution loads from Dittmer Mine Project, if it proceeds, reaching Repulse Bay and the Great Barrier Reef. This must be evaluated in any assessment for an Environmental Authority.

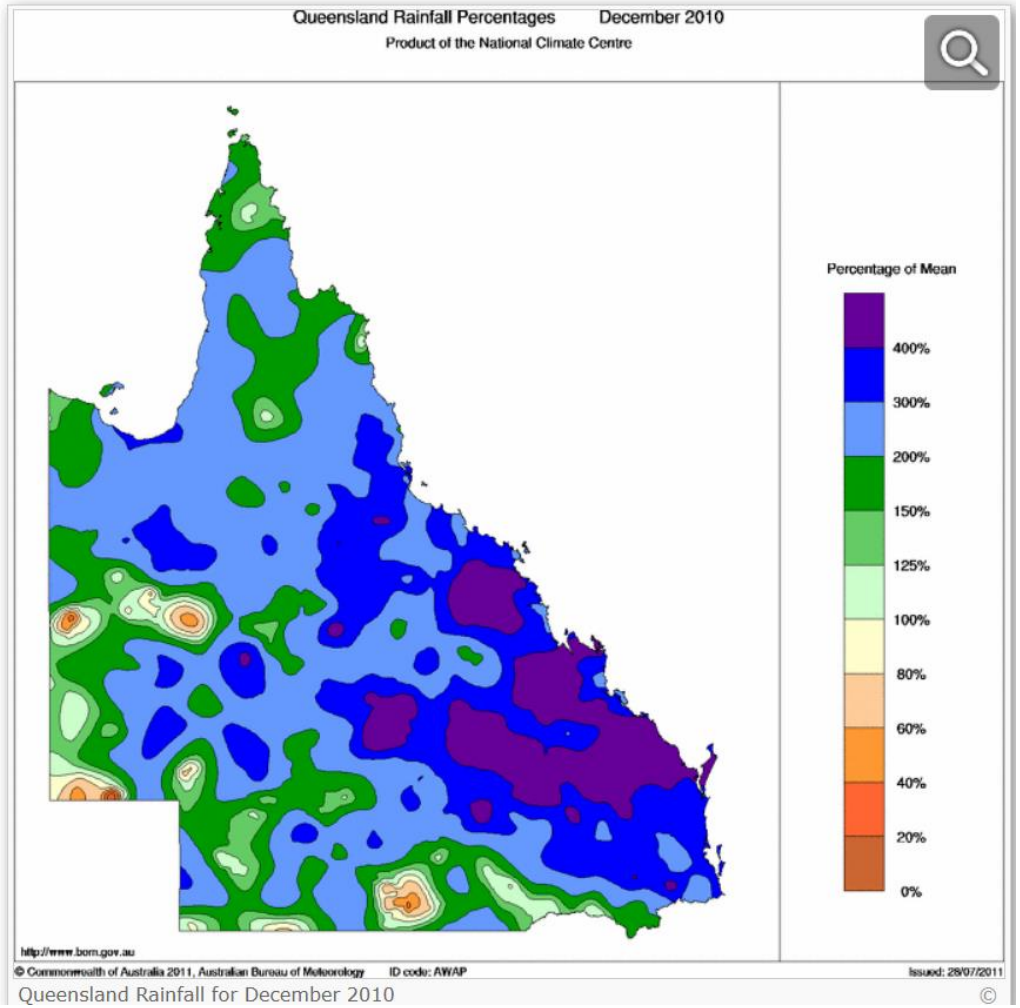


Fig. 66 Rainfall as a percentage of the mean for December 2010 (Source: BOM)

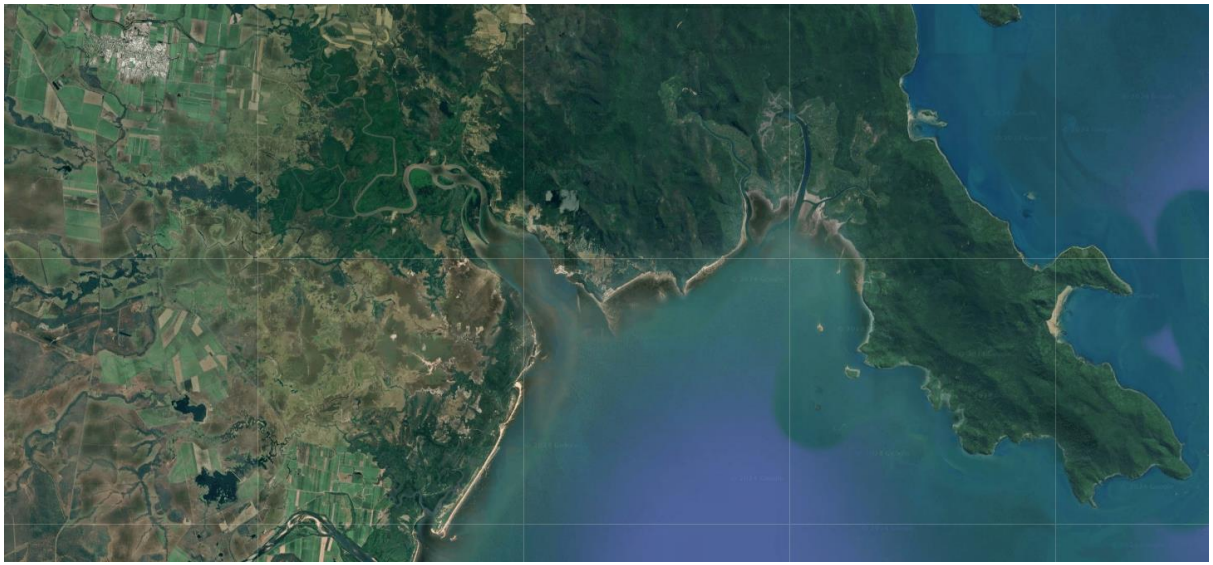


Fig. 67 Sediment in Repulse Bay

APPENDIX I

Environmental Authorities

Existing ML's 10340 and 10341 are currently contained within EPSL 00460513 which is a **code compliant EA** that requires the EA holder to comply with all conditions of **the Eligibility Criteria for Mining Lease Projects (ML Code)**. Ballymore applied to the Department of Environment and Science to amend the existing EA to add MLA 100351 to it.

Current environmental authority application or amendment documents

In Queensland, resource activities (which includes coal and mineral mining, petroleum and gas, geothermal and greenhouse gas storage activities) must have a specific type of licence called an environmental authority (EA) to operate legally.

As the environmental regulator, the Department of Environment, Science and Innovation is responsible for assessing applications for EAs. This includes applications for new Eas and applications to amend existing Eas for resource activities.

The table below provides links to information about current applications for Eas and major amendments to Eas for resource activities that are undergoing public notification as part of the assessment by the department.

Some of these applications may also be undergoing an Environmental Impact Statement (EIS) process. Find out more about current EIS projects.

The Dittmer mine project is not undergoing an Environmental Impact Statement (EIS) process.

Unless an application lapses or is withdrawn, it is accessible on this web page until a decision is made about the application. If an application for an EA or amended EA is approved, it will be available on the EA register.[77]

[77] https://apps.des.qld.gov.au/public-register/

Application Number	Principal Applicant	Application Action	Application Status	Application Date	Related Permit
A-EA-AMD-100386674	BALLYMORE RESOURCES LIMITED	Amend	Decided	17/02/2023	EPSX00593913
A-EA-AMD-100486450	BALLYMORE RESOURCES LIMITED	Amend	Assessment	21/08/2023	EPSL00460513

EA Applications

← Return to the main page

Details of application: A-EA-AMD-100486450

Application Action:	Amend
Principal Applicant:	BALLYMORE RESOURCES LIMITED
Application Status:	Assessment
Received Date:	21/08/2023
Related Permit:	EPSL00460513
Permit Version:	2
Permit Effective Date:	19/11/2010
Permit Status:	Granted

Activity	Location
Non-Scheduled Mining Activity - Mining Lease (ML)	ML100351 ML10340: WHITSUNDAY REGIONAL ML10341: WHITSUNDAY REGIONAL

Details of permit EPSL00460513

Permit type:	Resource Activity
Industry:	Minerals
Status:	Granted
Condition type:	Standard
Effective date:	19/11/2010
Permit holder(s):	BALLYMORE RESOURCES LIMITED

Activity	Location
Non-Scheduled Mining Activity - Mining Lease (ML)	ML10340: WHITSUNDAY REGIONAL ML10341: WHITSUNDAY REGIONAL

Document title	Date	Document link
EPSL00460513_20221108	08/11/2022	view document (PDF, 336 KB)
EPSL00460513		view document (PDF, 258 KB)

Search results for EA Applications | Queensland Government

Application Number	Principal Applicant	Application Action	Application Status	Application Date	Related Permit
A-EA-AMD-100386674	BALLYMORE RESOURCES LIMITED	Amend	Decided	17/02/2023	EPSX00593913
A-EA-AMD-100486450	BALLYMORE RESOURCES LIMITED	Amend	Assessment	21/08/2023	EPSL00460513

https://environment.desi.qld.gov.au/management/activities/non-mining/regulation/environmental-authority/current-ea-applications#mineral_applications

Have your say

You can have your say by making a submission on these applications when they are open for public consultation. Details are available on the department's public notices and consultations web page.[78]

A-EA-AMD-100486450	Ballymore Resources Limited	Non-scheduled mining activity – mining lease	Whitsunday Regional	ML100351 (in application) ML10340 ML10341	5 Sep 2023	Application document (PDF, 115KB) Supporting information (PDF, 722KB)

[78] https://environment.desi.qld.gov.au/management/activities/non-mining/regulation/environmental-authority/current-ea-applications#mineral_applications

APPENDIX II

Wonky Holes

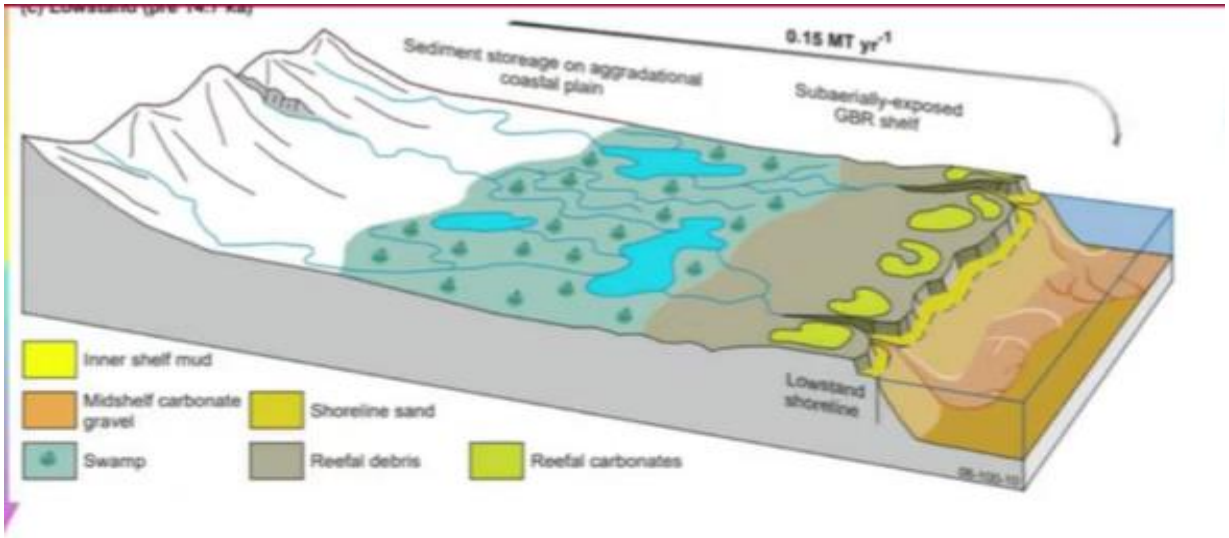
The mine footprint area (red square) is mapped as infrequently connected hydrologically to the Great Barrier Reef. But that would refer to the surface hydrology, not the groundwater hydrology. This region is known for wonky holes[79] i.e. groundwater flowing east through paleo channels formed when the sea surface was lower in the last ice age, from the Clarke Range then rising to the surface in Repulse Bay into GBR waters as freshwater pools in the denser sea waters of Repulse Bay and beyond into the inner GBR.

A description of the formation of wonky holes follows with diagrams copied from the online U Tube post.

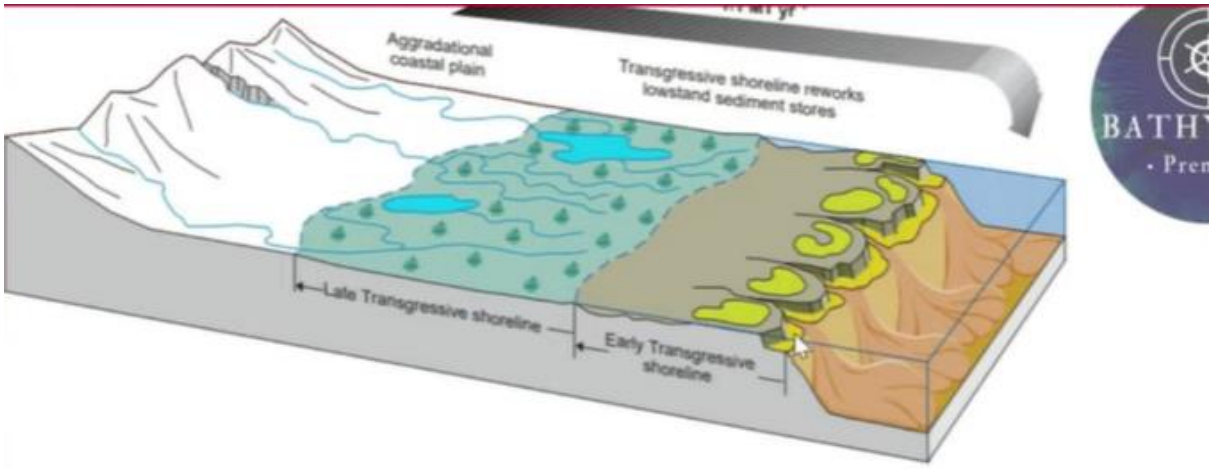
Formation of wonky holes[80]

Wonky hole is a colloquial, Australian term for a submarine groundwater discharge, a freshwater spring flowing from the seabed. Around 200 holes are known along the coast between Townsville and Cape York. Water flowing along the submarine riverbeds and exiting at wonky holes can be charged with nutrients carried from the mainland. These can cause eutrophication in the Great Barrier Reef lagoon but are known as great fishing spots.

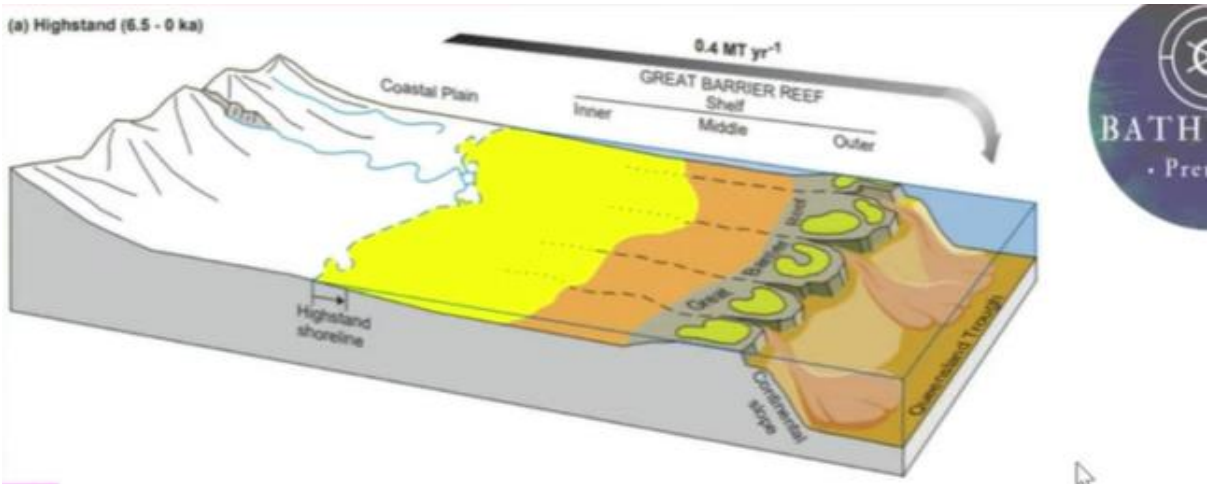
[80] Source: https://www.youtube.com/watch?reload=9&app=desktop&v=S-f2NNIZu3A



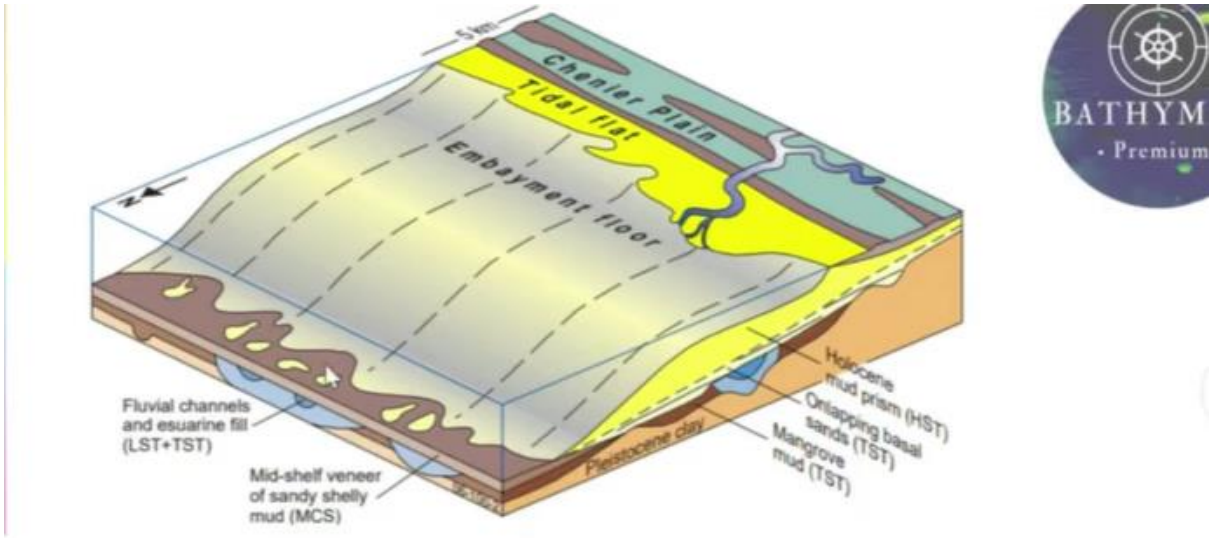
- Conceptual model of coast 15,000 yrs ago
- Ice age caused lower sea levels
- Shoreline below current continental shelf
- The current inner-shelf was a coastal plain
- Rivers flowed across current submerged continental shelf



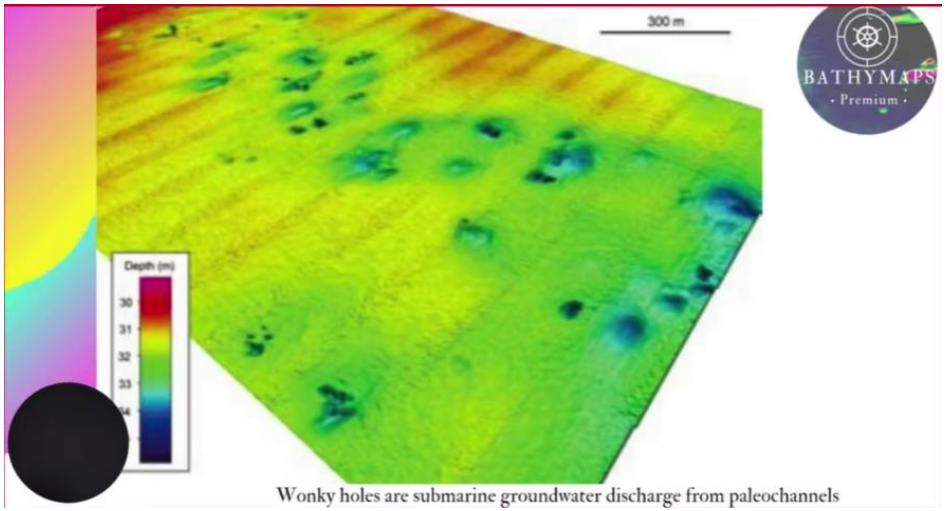
- After the ice age broke, ice caps melted and sea level started rising
- The continental shelf started to become submerged
- The coastal plain and rivers were flooded



- The continental shelf has been flooded for about 6,500 years now
- The ancient rivers were covered with sediment
- The ancient rivers never stopped flowing though
- Heavier mud was deposited closer to the shoreline
- The coastal mud deposits are called the sediment wedge



- The sediment wedge thins out moving further away from the shoreline
- Approximately 20m depth contour the sediment wedge thins
- Paleochannel sediments are exposed
- Groundwater is able to escape the palechannel forming a wonky hole



Wonky holes are submarine groundwater discharge from paleochannels