Coordinated Project Application Initial Advice Statement

Diatreme Resources Northern Silica Project

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Synopsis	Initial Advice Statement to support an application for Coordinated Project status under the *State Development and Public Works Organisation Act 1971* for Diatreme's Northern Silica Project

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Amendment Record

The Amendment Record below records the history and issue status of this document.

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1 Introduction

This Initial Advice Statement has been prepared to support an application under s27A of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) for declaration of the Northern Silica Project (NSP) as a coordinated project. The content of this IAS has been prepared based on the *Application Guideline: Coordinated project declaration under the State Development and Works Organisation Act 1971* (2023).

The NSP has been declared a controlled activity under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (ref. EPBC 2023/09485), to be assessed through an accredited process under the Queensland-Commonwealth Bilateral Agreement. If declared a coordinated project under the SDPWO Act, it is anticipated that the NSP would be assessed under both Acts through an Environmental Impact Statement (EIS).

1.1 Summary of Project

The NSP is a proposed silica sand project located within the Cape Flattery to Cape Bedford silica mineral province, with maritime export through the Port of Cape Flattery.

The proponent for the project is Northern Silica Pty Ltd (ABN 44 659 896 653), a wholly-owned subsidiary of Cape Silica Holding Pty Ltd (ABN 45 659 896 189), both of which are controlled by ASX listed Diatreme Resources Ltd (Diatreme) (ABN 33 061 267 061). Cape Silica Holdings Pty Ltd is a Joint Venture (JV) between Diatreme (73.2%) and Sibelco (26.8%).

The NSP is located approximately 35 km north of Hope Vale township and 14 km west of the Port of Cape Flattery. Key details for the project are presented in Table 1.1. Figure 1.1 shows the infrastructure layout for the site, the mining lease application areas and the proximity of nearby development and land uses.

Table 1.1 NSP description

Element	Description
Name	Northern Silica Project
Short summary	The NSP will include mining of silica sand at an initial rate of 3.75Mtpa during Phase 1 operations for the first 2 years with scope to expand operations during Phase 2 to 6.25Mtpa over the remaining 23 years life of mine. These equate to production rates of 3 to 5Mtpa for Phase 1 and Phase 2 respectively. Mining will occur via loader or dry bucket wheel system which will feed silica sand to trommels or vibrating screens. Sand is then pumped as a slurry to a processing plant and the processed material transport to the Port of Cape Flattery via conveyor for loading on to oceangoing vessels (OGVs) for export. The current established resource is 235Mt, of which 151Mt will be mined providing for a mine life of 25 years, with the possibility of extension. The remaining resource not currently considered in the economic evaluation will form part of continual expansion and resource definition.
Major infrastructure requirements	Key infrastructure components of the NSP will consist of the onsite processing plant, conveyors to transport sand to the port, onsite and offsite stockpiles, and any maritime infrastructure required to support construction and operational/export activities. Maritime infrastructure arrangements are currently being finalised in discussion with the Far North Queensland Ports Corporation Ltd ('Ports North') but could include a new barge ramp structure and an extension of the existing port wharf. Access to the site will be via one of two new mine access roads, to be constructed back to the Starcke Highway (Mount Webb Wakooka Road).
Operational land	The properties on which mining and supporting activities will be undertaken are described in Table 2.2. This land is dominated by coastal sand dunes and associated vegetation types with occasional perched lakes and marsh/wetland features. Maritime infrastructure and export activities will occur within the gazetted port limits for the Port of Cape Flattery.

Element	Description
Location	The main mining lease applications (MLAs for the NSP occur immediately adjacent to the Cape Flattery Silica Mine and is located 15km southwest of the Port of Cape Flattery. The site is 30km north of Hopevale Township (the nearest settlement), 50km north of Cooktown and over 200km north of Cairns. The NSP occurs within a known silica mineral province that stretches from Cape Bedford in the south to Cape Flattery in the north. Mining activities will be contained within Lot 35 on SP232620. Conveyance of material to the Port of Cape Flattery will cross Lot 9 on BS223 and Lot 10 on BS224. The northern access road option (MLA100311) crosses Lot 8 on SP104579.
Size and type of resource activity	The total estimated resource for the NSP is 235Mt which is comprised of 44% Indicated and 56% inferred mineral resources categories. Mining is proposed at a rate of 3.75 during phase 1 and up to 6.25Mtpa during phase 2 operations (equating to annual production of 3 and 5Mtpa for Phase 1 and Phase 2 respectively). From the total mineral resource 151Mt will be mined over the 25-year mine life to produce a total of 121Mt of product.
Mining tenements	The NSP consists of a series of proposed MLAs: • MLA100308 Northern Silica – this is the main mining activities MLA, including the mining, processing and stockpile areas and associated infrastructure. • MLA100310 Northern Silica Port Access – this is a proposed MLA for mining infrastructure, providing a corridor for the conveyor linking MLA100308 and the Port of Cape Flattery. It crosses the existing Mining Lease (ML) for the Cape Flattery Silica Mine (ML2965). • MLA100313 FNQPCL Cape Flattery Access – this is an MLA for mining infrastructure providing access over freehold land held by Ports North at the Port of Cape Flattery.* • MLA100311 Starcke-Northern Silica Access 1 – this is a proposed MLA for mining infrastructure, representing one of two options for an access road to the site from the Starcke Highway (Mount Webb Wakooka Road). • MLA100312 Starcke-Northern Silica Access 2 – this is a proposed MLA for mining infrastructure, representing the alternative access to the site from the Starcke Highway (Mount Webb Wakooka Road).
Off-lease activities	Maritime activities, including shiploading, barge logistics operations and transport off the MLAs will occur offsite, at relevant maritime infrastructure (described in Section 2.3.2). The preferred barging option is to use the existing CFSM barge ramp which also require the use of CFSM roads to provide access from the ramp to the Port of Cape Flattery access MLA (MLA100313). The road alignment to be used will be subject to suitable commercial and operational agreement being reached with CFSM and Ports North. Note that vehicle access from MLA100313 to the remaining MLAs will be via an access track that will run alongside the conveyor route on MLA10310 (subject to commercial agreement) or MLA100308 and therefore will not occur off-lease.
Land access	Access to the site is currently undertaken via existing access tracks that connect back to Mount Webb Wakooka Road. These access tracks are subject to periodic flooding during the wet season. Recognising this, Diatreme are currently investigation options to create additional temporary access tracks that can be accessed from the beach, thereby allowing cars and personnel to be brought to site by water. This will be progressed over coming months. As outlined above, future dedicated access to the site will be via one of two new mine access roads, to be constructed back to the Starcke Highway (Mount Webb Wakooka Road). The EIS process will determine the preferred road alignment.
Power and water supply	Diatreme are investigating the development of standalone solar/wind/hydrogen projects for power supply to the NSP, with backup diesel generations. Based on the mining footprints, the areas required for solar installations are easily accommodated. This approach will mitigate high costs for reticulating power over large distances and minimises the carbon footprint for the project. Dedicated wind turbines are also being considered as an option for processing facilities, and hydrogen as an alternative fuel to diesel. The preferred power generation will likely include a combination of diesel, solar, wind and hydrogen and will be determined based on a power optimisation study to be conducted for the NSP in parallel with the EIS. Regardless of option selected, power supply is intended to be provided onsite (within the MLAs) with no need to connect to the external grid. Water will be obtained via a groundwater bore to be located within MLA100308. Extracted water will be used for silica processing activities, dust suppression and for use in on-site camps, buildings and amenity facilities. As there is limited supply available from other allocation holders and sources, this water allocation will be subject to an approval process under the *Water Act 2000* and *Water Plan (Cape York) 2019* to allow for access to the strategic reserve. The total volume of water sought from the reserve is 3,500ML/yr for the life of the mine.
Accommodation and transport	Accommodation for workers will be principally provided onsite, although some workers may also commute from Hopevale Township. The principal transport route will be via the Starcke Highway (Mount Webb Wakooka Road) through the access road to the site.

*Note that Ports North have indicated a preference for access across Port land via licensing agreement, rather than MLA.

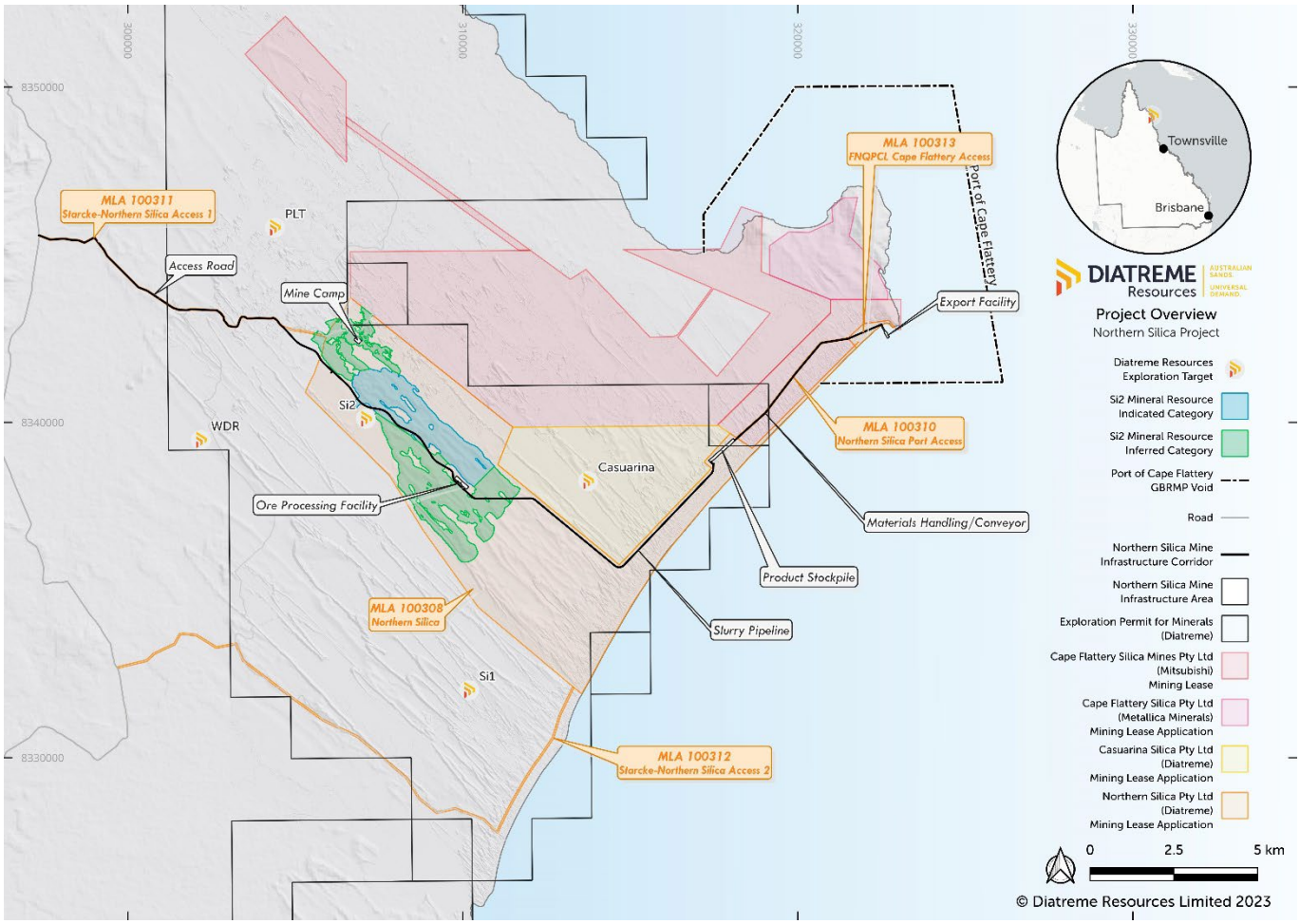

Figure 1.1 NSP mining area, infrastructure layout and location of MLA boundaries

Current access to site for exploration is via both sealed and unsealed roads and tracks, however road access will be upgraded progressively during exploration. Future dedicated road access to the site will be via one of two new mine access roads, to be constructed back to the Starcke Highway (Mount Webb Wakooka Road). The EIS process will determine the preferred road alignment.

In terms of product export and associated maritime infrastructure, the NSP will utilise the nearby Port of Cape Flattery. The Port of Cape Flattery is an existing gazetted port facility that is situated and operates within the Great Barrier Reef World Heritage Area but is excluded from both the Federal and State Marine Park boundaries in a port exclusion zone.

Within the Port of Cape Flattery, Diatreme will require access to a barge ramp to support initial construction as well as relevant maritime infrastructure for export of the silica product via Ocean Going Vessel. At present, the following options (in order of preference) are being considered by Diatreme for maritime infrastructure to support the NSP:

1. Use of an existing barge ramp operated by Cape Flattery Silica Mine (CFSM) in port limits and the use of the existing Port of Cape Flattery wharf (and conveyor structure) which is owned by the far North Queensland Ports Corporation (trading as Ports North) but operated by CFSM as the lessee. This option involves no new maritime infrastructure being developed for the NSP, although some minor modification to existing structures may be required. This option is subject to a suitable commercial and operational agreement being reached with CFSM and Ports North.

2. Construction of a new rock barge facility within the limits of the port to support initial construction and then use of the same structure for transhipment of silica product to a moored ocean-going vessel (OGV). The mooring arrangement for the OGV could either be at the existing berth of the Port of Cape Flattery Wharf (if there is capacity and the activity is permitted by the Port and CFSM) or else the construction of mooring dolphins seaward of the existing wharf.
3. Construction of a new barge facility as per option 2 and constructing a permanent extension to the existing wharf (e.g. via lengthening and/or widening of the wharf structure). This option allows for NSP operations to occur completely in parallel with existing CFSM operations.

There are ongoing commercial discussions between the Far North Queensland Ports Corporation Limited ('Ports North'), Diatreme and CFSM regarding the ability to share existing infrastructure. A 'part user' agreement is being developed that facilitates access to the Ports North land and to the Cape Flattery wharf for investigations to support the EIS. Pending these discussions and further investigations, a final maritime infrastructure option will be selected. However, this is anticipated to take several months and therefore all three maritime infrastructure options (outlined above) will be subject to environmental assessment as part of the EIS process.

Note that the NSP is distinct from other existing and proposed mining activities in the area, as shown in Figure 1.1. These include the CFSM and MLAs for Cape Flattery Silica Sands and Casuarina.

1.2 Coordinated Project Considerations

1.2.1 Justification for Coordinated Project Status

Section 27(2) of the SDPWO Act sets out the matters the Coordinator-General considers before making a decision about a coordinated project. These include the following matters:

> (i) complex approval requirements imposed by a local government, the State or the Commonwealth;
>
> (ii) strategic significance to a locality, region or the State, including for the infrastructure, economic and social benefits, capital investment or employment opportunities it may provide;
>
> (iii) significant environmental effects;
>
> (iv) significant infrastructure requirements.

The NSP would meet a number of these criteria as outlined below (not in any order of hierarchy):

Criteria (i) - Complex Approval Requirements

Access through CFSM lease area to the Port of Cape Flattery

The NSP is located immediately adjacent to the world's largest high quality silica sand mine at Cape Flattery Silica Mines (CFSM - Mitsubishi owned). Diatreme holds dominant exploration position in the known silica province extending from Cape Bedford to Cape Flattery, over a 500km^2 area. However, access to the port of Cape Flattery will, at all points of ingress, require an easement through CFSM's existing mining lease area that encircles the port. While Diatreme are actively engaging with CFSM concerning the granting of this access through a suitable commercial arrangement, it could be that this access can only be secured under section 316 of the *Mineral Resource Act 1989* which allows the Minister for Resources to facilitate this access without the consent of the lease holder if, *'[it] would optimise the development and use of the State's resources to maximise the benefit for all Queenslanders'*. While the Coordinated Project pathway cannot direct an outcome related to a Ministerial-level decision under an Act, it can assist to assess, analyse and demonstrate that the criteria around optimisation of State resources is met should a section 316 access easement be sought for the NSP in future.

Matters of National Environmental Significance

While the project makes use of the Port of Cape Flattery which is excluded from both the Federal and State Great Barrier Reef Marine Park (and thus consistent with the Reef 2050 Plan), the controlled action decision for the project identifies a number of Matters of National Environmental Significance (MNES) under the EPBC Act that will be triggered by the NSP. These include disturbance to nationally threatened species and vegetation communities on the mine site (including known areas of littoral rainforest), potential disturbance to threatened and migratory species and communities along access routes including conveyors or pipeline alignments and works and activities within or adjacent to the Great Barrier Reef World Heritage Area and Great Barrier Reef Marine Park. The Coordinated Project pathway can assist to ensure Australian Government environmental requirements under the EPBC Act are integrated within the single accredited State EIS process.

Access to Water Resources

While silica mining is a low environmental impact activity that avoids the use of harmful chemical agents and will be undertaken in dune areas situated above the natural ground water table, it will require a substantial volume of freshwater to support material processing. This volume will necessitate access to the strategic reserve under the Cape York Water Plan. While the first step of this approval process has been achieved through declaration of the NSP as a project of regional significance by the Queensland Department of Regional Development, Manufacturing and Water, the Coordinated Project pathway can assist to ensure the NSP receives an equitable water allocation under the *Water Act 2000* for its intended operation and guide the future State approval process.

Criterion (ii) - Strategic Significance – Regional Scale

At a state and national scale, silica is recognised as critical, 'new economy' minerals by both the Queensland government given its important role in renewable energy and the transition to a low carbon economy. At a local scale, the employment, skills, training and revenue generated by the NSP will directly benefit the Registered Native Title holders for the mining lease areas but also the Far North Queensland regional community as a whole. It is intended that the NSP is not run as a fly in-fly out operation and will instead draw from a local workforce that lives in neighbouring Cooktown and Hopevale Aboriginal Shire Councils. This is strongly aligned with the objectives of the *Strong and Sustainable Resource Communities Act 2017* (SSRC Act) to ensure that residents of communities near large resource projects benefit from the construction and operation of those projects. However there will need to be a robust assessment of potential social impacts and benefits across key issues such as workforce management, housing and accommodation, local business and industry procurement and health and community well-being. The Coordinated Project pathway can assist to ensure that the Social Impact Assessment and associated management plan for the project are coordinated and implemented.

Criteria (iv) - Significant Infrastructure Requirements – Port of Cape Flattery

Planning and implementation of any required changes to port infrastructure are being completed in good faith and in close consultation with Far North Queensland Ports Corporation Limited (Ports North), the State's responsible entity. However there are complexities associated with the use and suitability of the existing wharf and ship loading facilities (the latter of which are owned and maintained by CFSM) as well as the presence of a third proponent – Metallica Minerals - who also intend to tranship silica from within the port limits of the Port of Cape Flattery. The Coordinated Project pathway can assist to ensure a whole of Government solution is reached for future export operations at the Port of Cape Flattery, including the preferred arrangement for infrastructure and maritime shipping and barging operations.

1.2.2 Purpose and Scope of the IAS

Consistent with the above assessment and based on the controlled action decision for the NSP under the EPBC Act, Diatreme considers an **EIS** would be the most appropriate assessment pathways for the project under the SDPWO Act.

Accordingly, the purpose of this IAS is to:

- Support an application to the Coordinator-General to declare a coordinated project for which an EIS is required;
- Provide information that may assist the Coordinator-General to determine whether an EIS process is appropriate;
- Inform preparation of the Terms of Reference (ToR) for an EIS under the SDPWO Act; and
- Inform stakeholders and the general public.

1.2.3 Overview of the Need for the Project and Potential Impacts

As described further in Section 2 of this IAS, the need for the NSP is underpinned by:

- The Australian and Queensland Critical Minerals Strategies - noting that critical minerals are essential in the development and manufacturing of modern technology and facilitating Australia's clean energy transition. Queensland's rich endowment of critical minerals makes it well-placed to seize this economic opportunity and service global demand.
- Addressing current and future market demand – noting that the global silica market is experiencing unprecedented demand from emerging consumers such as China and India from foundry, automotive and construction industries including, most notably, the solar PV market. The Australian Securities Exchange (ASX) Scoping Study for the NSP released publicly by Diatreme in June 2023 indicates the potential for a long-life mining project with strong economic outcomes based on addressing this market demand.
- Regional benefits – noting that the NSP will produce tangible economic and social benefits to the Far North Queensland region that will improve the welfare of local communities, including First Nations communities. Diatreme has already committed to initial First Nation's employment target of 60% that will be tracked by key performance indicators (KPIs). This process has already commenced with a number of local employees engaged by Diatreme based in Cooktown and Hope Vale to support the project.

In accordance with the aims of the Queensland Critical Minerals Strategy, Diatreme believes the NSP can be constructed and operated in a way that protects the environment, communities and the cultural heritage of First Nations people.

The NSP will involve the disturbance of terrestrial ecosystems associated with clearing and mining activities. This disturbance has the potential to impact on threatened flora and fauna that occur across the landscape, including bats, coastal reptiles and woodland and wetland birds. Part of the Project footprint also includes areas of littoral rainforest, including communities that meet the diagnostic criteria for the federally listed Littoral Rainforest Threatened Ecological Community (TEC). To the extent the Project involves the development of new infrastructure in the coastal zone (e.g. conveyor, new maritime infrastructure), it will also impact on foredune and marine habitats which may support shorebirds and marine turtles. These areas may also support features of cultural heritage significance, including potential artefacts and important sites.

Mining processes, including operations, will involve groundwater extraction and reinjection. Mining areas will also lead to disturbance of local drainage characteristics and could lead to potential runoff to retained surface water bodies (e.g. wetlands, creeks).

To minimise the potential impacts of these activities, a comprehensive design and environmental management process will be undertaken during the EIS to develop measures to avoid, minimise, or mitigate impacts. Some of these measures are likely to include the following:

- All mining will occur above the groundwater table so as not to interfere with groundwater levels or quality
- The mining footprint will seek to avoid/minimise impacts to areas of littoral rainforest and other vegetation habitats of conservation significance
- The mining footprint will avoid and be buffered from wetlands, waterbodies and waterways on the mining lease area and demonstrate 'no change' to groundwater and surface water quality offsite
- The mining footprint and associated infrastructure will avoid identified areas of cultural heritage significance identified through close consultation and engagement with the Registered Native Title Body Corporates (RNTBCs) and Traditional Owners of the land
- Adopting no/low impact options for the maritime infrastructure arrangements at the Port of Cape Flattery (where possible to do so in the context of negotiations with relevant parties)
- Ensuring adaptive management of groundwater extraction that is required for mineral processing to ensure drawdown does not affect wetlands and other groundwater dependent ecosystems (GDEs)
- Avoiding chemical treatment in processing processes other than the use of biodegradable flocculant
- No direct discharge of contaminants from mining operations to waterways or water bodies other than re-injection of clean water back to the groundwater aquifer
- Progressive rehabilitation for all vegetation and landforms in accordance with a Progressive Rehabilitation and Closure Plan; with the opportunities for both on-site/off-site creation and enhancement of compensatory habitat

The EIS process will be undertaken to confirm and demonstrate these commitments to ecologically sustainable development associated with the Project.

1.3 Stakeholder Consultation

In terms of consultation and engagement with key stakeholders and the local community, Diatreme has already established a local presence and staff in Hope Vale and Cooktown and implements a comprehensive Community Engagement and Communications Strategy. The Strategy aligns with the consultation, engagement and communication expectations set forth in the Coordinator-General's Social Impact Assessment (SIA) Guideline 2018:

- **Comprehensive Approach to Engagement**: The strategy emphasises a multi-faceted approach to community engagement, focusing on both targeted and mass-distribution communication methods. This is line with the SIA Guidelines, which advocate for a comprehensive and inclusive approach to stakeholder engagement.

- **Roles and Responsibilities**: The strategy clearly delineates the roles of the Community Engagement Coordinator and Community Liaison Representatives, who are responsible for the day-to-day engagement and reporting. This ensures clarity and accountability in line with the SIA Guideline's expectations.

- **Communication Management Structure**: The strategy incorporates a Communication Management Structure and an Inquiry/Complaints Register, maintained through Simply Stakeholders. This aligns with eh SIA Guidelines' focus on transparent and accountable engagement processes.

- **Transparency and Inclusivity**: Both the strategy and the SIA Guideline prioritise transparent and inclusive engagement. Diatreme's methodologies, such as Open Mornings in Community, are designed to foster open dialogue and include diverse community perspectives.

- **Information Dissemination**: In line with the SIA Guideline, our strategy employs multiple channels for information dissemination, including project-specific factsheets and a robust social media plan.

- **Monitoring and Evaluation**: The strategy outlines quantitative and qualitative measures for assessing the effectiveness of the engagement activities. This is in line with the SIA Guidelines' recommendation for ongoing monitoring and evaluation.

Moreover, Diatreme's current Community Engagement and Communications Plan (the Plan) aligns with the SIA Guidelines as follows:

- **Stakeholder Identification**: The Plan includes a comprehensive annexure that lists Key Stakeholders, which is in accordance with the SIA Guideline's emphasis on stakeholder identification and profiling (NB: this list is "live" and constantly changing with feedback and interactions). Additionally, stakeholders are mapped in our engagement software, Simply Stakeholders.

- **Sustained Engagement**: Consistent with the SIA Guideline's requirement for ongoing engagement, the plan outlines a three-month plan with provisions for monthly evaluations and adjustments, ensuring sustained community interaction. Creating short-term plans ensures the process is continuous and iterative.

Through these processes, Diatreme already has a strong understanding of the range of issues and concerns held by the RNTBCs, community and stakeholders about the project and will explore further resolution of these issues through the EIS process. This will include undertaking Social Impact Assessment (SIA) and Social Impact Management Plan (SIMP) processes required to be developed and approved as part of the EIS.

2 Project Context and Description

2.1 Strategic Context

2.1.1 Critical New Economy Mineral

The target mineral for the NSP is silica sand. Silica has been identified as a critical new economy mineral. Both the Commonwealth Government and the Queensland Government have recently announced policies regarding Australia's 'new economy' minerals. As a critical component in the manufacture of mobile phones, flat screen monitors, and solar panels, silica is a key new economy mineral in the short term. Silica is explicitly noted as a critical mineral in the Queensland Critical Minerals Strategy (2023) while the (then) federal Department of Industry, Innovation and Science (2019) Australia's Critical Minerals Strategy 2019 creates a framework for recognition of silica as a critical mineral subject to technological and market developments.

The Queensland Critical Minerals Strategy (2023) notes that,

> *Critical minerals are essential in the development and manufacturing of modern technology and facilitating Australia's clean energy transition. Queensland's rich endowment of critical minerals makes it well-placed to seize this economic opportunity and service global demand.*

To this end the Strategy commits Queensland to prioritise the exploration and extraction of its critical mineral resources, while fostering domestic innovation, investment, and sustainable practices.

The Strategy sets out a series of actions to facilitate this objective including the establishment of critical mineral zones, where it states,

> *A place-based approach will be undertaken where critical minerals projects are co-located in one regional area…consultation will be undertaken to investigate this approach at [other] locations, including Cape Flattery, focusing on silica.* p12

The Queensland Department of State Development, Infrastructure, Local Government and Planning has also issued its New Economy Minerals: Investment Opportunities in Queensland's Minerals Provinces (DSDILGP 2021). This strategy also lists silica as one of a range of new economy minerals in both the solar technology and electric vehicles & energy storage sectors. The strategy notes that:

> *New economy minerals are essential in the manufacture of many emerging technologies, including electric vehicles, renewable energy products, low-emission power sources, consumer devices such as smartphones and tablets, and high-tech products used in advanced manufacturing for medical, defence and scientific research applications. (p7)*

The Australian Government's Australia's Critical Minerals Strategy 2019 (Department of Industry, Innovation and Science 2019):

> *… aims to refine Australia's policy settings to enable the resources sector to supply the growing markets for raw and refined critical minerals. It is a key part of the Australian Government's broader plan for Australia's resources sector, set out in the National Resources Statement. The Strategy sets out actions to refine the settings in Australia's critical minerals market in three key areas. (p7)*

These three areas listed are:

- promote investment into Australia's critical minerals sector and downstream processing activities
- provide incentives for innovation to lower costs and increase competitiveness

- connect current and pipeline critical minerals projects with infrastructure development.

Overall, these strategies and policies indicate that that there is established and growing support for critical minerals such as silica in coming years, underpinning the need for the NSP.

2.1.2 Addressing Market Demand and Economic Feasibility

As identified above, high purity sand is required for making both flat glass and container glass as impurities such as sulphides and iron will cause imperfections. High-tech applications such as fibre-optics, LCD panels, LED lights and solar panels require ultra-clear glass produced with high purity silica sand. Supply is becoming an issue globally with anecdotal reports of illegal mining being widespread in some countries. Market research firm IMARC Group previously estimated the global silica sand market could grow from $US7 billion in 2018 to $US20 billion in 2024. This comes off the back of a previous decade of strong global growth from $US3.5 billion in 2009 to $US6.8 billion in 2017. Within the Asia Pacific region, growth projections are from $US5.8 billion to $US8.7 billion by 2028, with a compound annual growth rate (CAGR) of 7.16% (IMARC, 2023).

Australia has several quality silica sand projects that are either in production or progressing through the exploration and development process. Silica sand has many uses, the market is experiencing increasing demand from emerging consumers such as China and India from foundry, automotive and construction industries including the solar PV market.

Accelerating growth in solar panel market, where silica is the main component (70%) (Figure 2.1). Supply is diminishing as a lot of the sand used in Asia comes from rivers where environmental concerns are increasingly restricting extraction. There are no direct substitutes in the majority of applications.

Further details around the quality of the local resource and economics of the project are contained in a detailed Scoping Study released publicly by Diatreme via the ASX in June 2023. Key highlights from the economic analysis within the Scoping Study include:

- Net present value of $1,410M pre-tax and $830M post-tax
- Internal rate of return of 33% pre-tax and 32% post-tax
- Payback over 6 years
- Net revenue of the life of mine of $9,783M with a life of mine OPEX of $2,298M and sustaining CAPEX of $180M.

A summary of NSP economics from the Scoping Study is presented in Table 2.1. Note these are modelled figures with typical accuracy of ±35%. This is based on a sales price of $81/t, based on extensive market research and discussions on behalf of Diatreme. Initial assumptions are for 100% export of silica product, noting the bulk of PV manufacture currently occurs in China. However, opportunities for downstream mineral processing and refinement in Australia (refinement to silicon in the Townsville region) are also being considered. Note that operating costs have a low sensitivity (movement of ±5%) with greater variability in exchange rate, silica price and production rates (~±25%).

Estimated capital costs are $534.8M, including an initial capital expenditure of $355.6M to develop the mine at a 3Mtpa capacity, with a subsequent expenditure of $179.2M to expand to 5Mtpa capacity. These costs include a 15% contingency. Operating expenditure is listed in Table 2.1. Note this is based on development of new maritime infrastructure for the project; where existing infrastructure is used (as per the base case) the capital expenditure would be less.

The Scoping Study indicates the potential for a long-life project with strong economic outcomes. Diatreme anticipates the assembly of a structured project finance package to be readily available from traditional banking sources around the time of the Final Investment Decision (FID).

Table 2.1 Summary of financial returns of NSP

Economic metric		Amount
Net present value (pre-tax)	A$m	1,410
Internal rate of return (pre-tax)	%	33%
Net present value (post-tax)	A$m	830
Internal rate of return (post-tax)	%	32%
Weighted average cost of capital	%	10%
Payback years	years	6
Mine life	years	25
Life of mine net revenue	A$m	9,783
Life of mine operational expenditure	A$m	2,298
Life of mine sustaining capital expenditure	A$m	180
Initial capital expenditure	A$m	535
Sales price free on board	A$tm	81
Shipping and marketing	A$t	24
Free on board cost	A$t	27.40

Diatreme is supported by its major cornerstone investors who have ensured the Company and the NSP received appropriate funding during the exploration and pre-development stages. These investors have shown interest in assisting with, and potentially participating in the ongoing project development costs, including participating in the funding for the capital required for project construction. The extent of the involvement of these shareholders in any future funding arrangements is subject to standard commercial evaluations as the project progresses and the success in achieving the permits and approvals required for the project to be implemented.

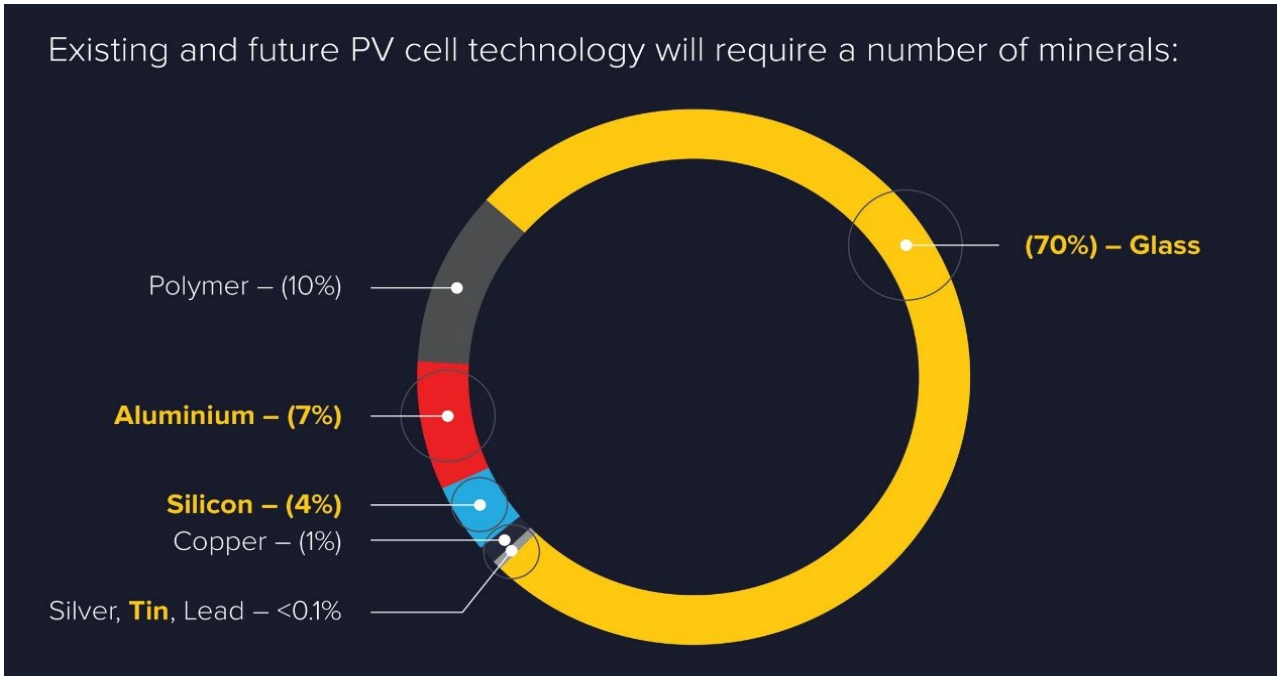

Figure 2.1 Composition of minerals required for PV cell technology (World Bank, 2020)

Leading global materials solutions leader Sibelco is a major shareholder in Diatreme and is a joint venture partner in the NSP. Sibelco's involvement is backed by a $35 million investment being made with an initial investment of $11 million and a second tranche of $24 million due for drawdown in December 2024.

The funds received from these investment tranches will be utilised by Diatreme and the joint venture to:

- Advance the development of the silica projects, maintain tenements, and meet ongoing obligations for exploration, permitting, economic studies and the approval and permitting processes.
- Maintain ongoing community obligations related to these activities.

A copy of the full scoping study document is publicly available at https://diatreme.com.au/

2.1.3 Regional Employment and Economic Opportunities

The NSP will produce tangible benefits to the region that will improve the welfare of local communities including First Nations communities.

Initial employment estimates for the project are as follows:

- Construction work force – at least 120 jobs
- Operational work force – at least 90 jobs

As outlined most workers will be sourced from the townships of Hope Vale and Cooktown. They will be accommodated in Hope Vale and Cooktown during construction (and transported to site via bus) and then on an onsite mine camp during operation.

Diatreme has an initial First Nation's employment target of 50% that will be tracked by key performance indicators (KPIs). This process has already commenced with a number of local employees engaged by Diatreme based in Cooktown and Hope Vale to support the project.

The project will involve up to $534.8 million of capital expenditure from DRX for mine establishment and operation. This excludes additional expenditure that could be required to facilitate upgrades of port infrastructure at the Port of Cape Flattery.

The 25-year life of mine operating costs are estimated at more than $2.2 billion, in terms of economic benefits from the project a significant portion of the operational costs will be spent within the local region of Hope Vale and the surrounding region. Economic benefits for the local and Queensland economy will be in the form of wages, taxes and royalties. These economic benefits will be further quantified as part of the project EIS.

Mining Project Agreements (MPAs) will be developed between Diatreme and the Traditional Owner representative organisations. As appropriate, these will include the Registered Native Title Body Corporates of Hopevale Congress and Walmbaar, the Darrba Land Trust and the Cape York United Number 1 Claim. These agreements will confirm relevant equity sharing arrangements between the company and affected Native Title holders together with employment opportunities. MPA negotiations for the NSP are still ongoing and forecast to be completed by the end of 2023.

Social benefit and impacts will be fully outlined through a Social Impact Assessment (SIA) and Social Impact Management Plan (SIMP) prepared under the Queensland *Strong and Sustainable Resource Communities Act 2017* as part of environmental studies.

The NSP will contribute to state and national revenue through tax and royalties. This includes an assumed 30% Australian corporate tax and a state royalty of $0.90/wmt silica sand sold, based on the *Mineral*

Resource Regulation 2013. Additionally, there will also be Traditional Owner royalty calculated as a percentage of project revenue, subject to formalisation of the Mining Project Agreements (MPAs).

Based on an estimated 121Mt of product over the life of mine (which is the estimate used for the purposes of the Scoping Study), this would produce >$100M of State royalties.

2.2 Location and Extent

The NSP will occur across the following lots:

- Lot 35 on SP232620 – this is Aboriginal freehold land, held by Hopevale Congress. The majority of mining activities will be contained on this lot, including all of MLA100308 (mining area) and MLA100310 (port access).
- Lot 9 on BS223 and Lot 10 on BS224 – this is freehold land, held by Ports North as part of the strategic port land for the Port of Cape Flattery. This land would be used for transportation of silica product through to maritime infrastructure for export. Note that this land is currently sub-leased by CFSM.

Access road option 1 (corresponding to MLA100311) provides connection between Lot 35 and Mount Webb-Wakooka Road via Lot 8 SP104579. If this option was selected, therefore, this would form part of the operational land. Lot 8 is owned by the Darrba Land Trust as Aboriginal freehold land. Access road option 2 (corresponding to MLA100312) utilises an existing road reserve between Mount Webb-Wakooka Road and the coast, before transiting through Lot 355.

Table 2.2 present a description of each of these lots. As the main mining and infrastructure areas occupy a portion of the above lots, the operational land does not consist of the full lot but only the land relevant to the project, as shown in Figure 2.2. The main MLA for the NSP (MLA100308) covers 4,681ha. Depending on which access MLA is adopted (MLA100311 or MLA100312), the total MLA coverage for the NSP will be 4,791.93 to 4,836.28ha.

Table 2.2 Description of operational land

Lot on plan	Associated MLAs	Existing land use*	Proposed NSP activity
35SP232620	MLA100308 Northern Silica MLA100310 Northern Silica Port Access MLA100313 FNQPCL Cape Flattery Access MLA100311 Starcke-Northern Silica Access 1 MLA100312 Starcke-Northern Silica Access 2	Managed resource protection Minimal use Lake Marsh/wetland	Mining activities and associated infrastructure Main product stockpiles Access road Alternative access road
9BS223**	MLA100313 FNQPCL Cape Flattery Access	Port land – Waterfront Port Industry Precinct	Silica product conveyor Emergency stockpile
10BS224**	MLA100313 FNQPCL Cape Flattery Access	Port land – Waterfront Port Industry Precinct	Silica product conveyor Emergency stockpile
8SP104579	MLA100311 Starcke-Northern Silica Access 1	Grazing native vegetation	Access road
Unnamed road reserve between Mount Webb Wakooka Road and coast	MLA100312 Starcke-Northern Silica Access 2	Road	Alternative access road

*Land use is as mapped on Qld Globe or as zoned under the Port of Cape Flattery Land Use Plan
**Lots 9 and 10 are currently sub-leased by CFSM. Ports North preference is for access to be provided via a licensing agreement rather than MLA.

Part of Lot 35 is already covered by ML2965 which is the mining lease corresponding to the Cape Flattery Silica Mine. As noted previously, the preferred conveyor option is via MLA100310 which crosses this lease. The relationship between the NSP and other silica projects in the region is shown in Figure 2.3.

There is minimal infrastructure on site, other than minor access tracks connecting exploration areas through to Mount Webb-Wakooka Road.

LEGEND

- Mining Leases
- Port Limits
- Cadastral Boundaries

Title:

Locality Map for NSP

Figure: 2.2

Rev: A

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LEGEND

Mines

- Existing
- Proposed
- Port Limits
- Water Plan Catchments

Title:

Geographical Context for NSP

Figure: 2.3

Rev: A

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2.3 Project Activities and Elements

Key details for the project are presented in Table 1.1 and shown in Figure 2.4. A more detailed summary together with supporting maps are provided below. Note that Figure 2.4 presents the preferred infrastructure options for the project. Alternatives are discussed in Section 2.4.

2.3.1 Mining Operations and Conveyance

The NSP will consist of silica mining via a loader or potentially dry bucket wheel system which will feed silica sand to trommels or vibrating screens. Sand will then be pumped as a slurry to a processing plant with capacity up to 6Mtpa. Processing will be via an innovative and modular CDE Global Australia Pty Ltd (CDE)-Diatreme designed plant that minimises iron contamination, delivering a low iron content silica product. During mining operations, a dozer will also be used to undertake progressive vegetation and topsoil stripping along with rehabilitation, subject to a progressive rehabilitation and closure plan (PRCP).

Mining will typically occur across 12-month mining panels, aligned northwest to southeast, although the size of panels will be subject to further analysis during the next stage of feasibility studies. The intention is for mining panels to progressively exploit the dune, migrating towards coastal areas. All mining will be conducted above the water table. Mining operations are anticipated to occur 24 hours a day, 360 days per year.

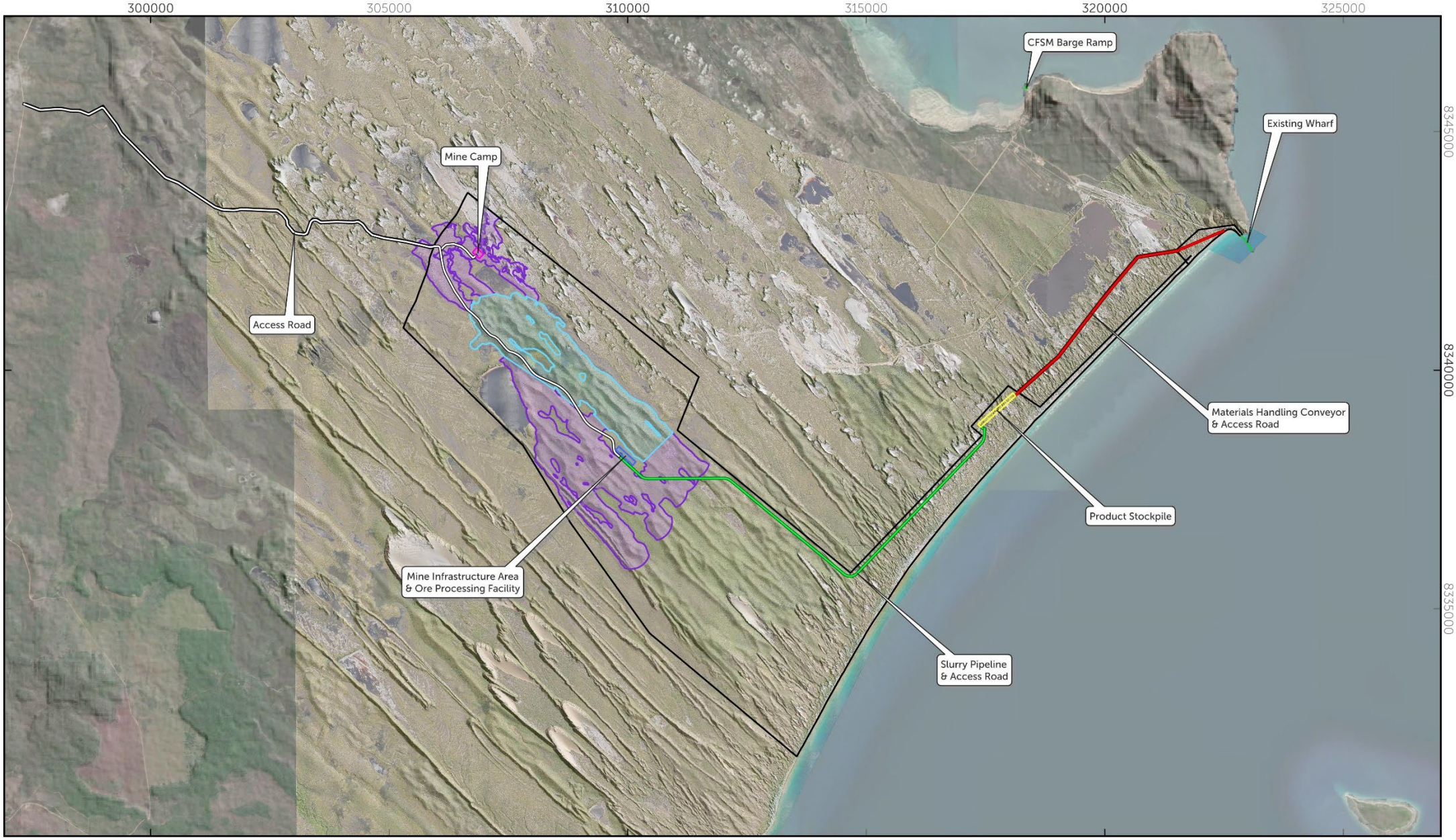
Mining will start at an initial rate of 3.75Mtpa (producing 3Mtpa of product) for Years 1 and 2, increasing to 6.25Mtpa (producing 5Mtpa of product) from Year 3 onward. The shift to higher mining and production rate will primarily consist of introduction of an additional processing train for the processing plant, increasing from a starting design of two trains to total of three.

Bulk stockpiles of processed material will be located within MLA100308 from where product will be conveyed to the Port of Cape Flattery via conveyor. From here it will be loaded on to oceangoing vessels (OGVs) for export. The design of stockpiles and associated dewatering within MLA100308 is yet to be engineered but is expected to include proprietary CDE-EVO wash systems and water returns to the processing plant via return water line. An area for stockpiling will also be located within MLA100313, on Ports North freehold land (9BS223, 10BS224), limited to an emergency source of 50kt of silica product in the event of conveyor failure.

The preferred route for conveyance will be through the CFSM ML2965 either by commercial agreement with CFSM or by way of a s316 easement/transportation lease under the Queensland MR Act. In the event of an issue associated with achieving this lease, MLA100308 includes a beachfront access strip through to Ports North land, noting that this option is potentially constrained as it will occur within the erosion prone area declared under the Coastal Act. These options are discussed further below.

At the Port, the project is anticipated to generate four to five OGV movements per month on average (or one movement per week) during Years 1 and 2 (i.e. when producing at 3Mtpa). This will then increase to seven to eight OGV movements per month (or one to two movements per week) for the balance of the mine life (i.e. when producing at 5Mtpa).

The complete NSP infrastructure and mining areas (including both indicated and inferred resources) covers 1,073ha which represents ~22% of the overall MLA footprints.



- Mine Camp
- Mine Infrastructure Area & Ore Processing Facility
- Product Stockpile
- Existing Port Infrastructure
- Access Road
- Materials Handling Conveyor & Access Road
- Slurry Pipeline & Access Road
- Northern Silica Project: Mining Lease Application
- Mineral Resource Estimate: Indicated Category
- Mineral Resource Estimate: Inferred Category

0 2.5 5 km

DIATREME Resources

Figure 2.4

Northern Silica Project

Preferred Infrastructure Options

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Version #: 1.0	CRS: GDA2020 / MGA Zone 55 (EPSG:7855)
Author: Frazer Watson	Date Created: 24/11/2023
Approved: Alastair Bauer	Date Approved: 24/11/2023

2.3.2 Maritime Infrastructure

Within the port, Diatreme will require access to a barge ramp to support initial construction as well as relevant maritime infrastructure for export of the silica product via OGV. At present, the following options (in order of preference) are being considered by Diatreme:

1. Use of an existing barge ramp operated by CFSM in port limits and the use of the existing Port of Cape Flattery wharf (and conveyor structure) which is owned by Ports North but operated by CFSM as the lessee. This option involves no new maritime infrastructure being developed for the NSP, although some minor modification to existing structures may be required. This option is subject to a suitable commercial and operational agreement being reached with CFSM and Ports North.

2. Construction of a new rock barge facility within the limits of the port to support initial construction and then use of the same structure for transhipment of silica product to a moored OGV. The mooring arrangement for the OGV could either be at the existing berth of the Port of Cape Flattery Wharf (if there is capacity and the activity is permitted by the Port and CFSM) or else the construction of mooring dolphins seaward of the existing wharf.

3. Construction of a new barge facility as per option 2 and constructing a permanent extension to the existing wharf (e.g. via lengthening and/or widening of the wharf structure). This option allows for NSP operations to occur completely in parallel with existing CFSM operations.

The rock barge ramp, if constructed, would be made of crushed rock material in combination with geogrid and geofabrics, including primary and secondary rock armour layering. It would be constructed with suitable width to allow for the conveyor system, barge loader and access/maintenance corridors, and have a length of approximately 450m to reach appropriate navigable depths. The ramp would be suitable for loading on to an 8,500t capacity barge which would then ship to a 55,000t capacity OGV moored in the port.

The wharf extension would involve a continuation of the existing wharf by 260m, utilising the same design approach to allow for extension of the conveyor system. This would be sufficient to allow for direct loading to a 55,000t capacity OGV.

These options are discussed further below.

As outlined previously, there are ongoing commercial discussions between the Far North Queensland Ports Corporation Limited (‘Ports North’), CFSM and Diatreme regarding the ability to share existing infrastructure. A ‘part user’ agreement is being developed that facilitates access to the Ports North land and to the Cape Flattery wharf for investigations to support the EIS. Pending these discussions and further investigations, a final maritime infrastructure option will be selected. However, this is anticipated to take several months and therefore all three maritime infrastructure options will be subject to environmental assessment as part of the EIS process.

Note that for the purposes of the Scoping Study, the development of a new rock barge facility and extension of the existing wharf (option 3 above) was selected as the basis of further feasibility and modelling. This was based on a conservative approach that recognises the potential for existing infrastructure to not be available and does not indicate a preferred solution.

2.3.3 Site Access

Access to the NSP site is proposed through one of two alternate access routes (in order of preference):

1. Starcke-Northern Silica Access 1 – this is a ~10 km long access route connecting from the Starcke Highway (Mount Webb Wakooka Road) to the western end of MLA100308. This is the preferred access route for the site.

2. Starcke-Northern Silica Access 2 – this is a ~18 km long access route that follows a gazetted road from the Starcke Highway through to the coast and then travels north to connect to the southern end of MLA100308.

Access 1 is a more direct and shorter route but is subject to landowner negotiations as it crosses additional freehold lots outside the Aboriginal freehold land of the Hopevale Congress RNTBC. Both options are further discussed below.

In addition to land-based access, site access may also occur by sea through the Port of Cape Flattery but this will be dependent on the maritime infrastructure developed (see Section 2.3.2). Connection from maritime infrastructure would be provided through an access track adjacent to the conveyor between the port and stockpile. It is noted that the distance between Cooktown and the port may make any sea-based commuting for workers unfeasible.

2.3.4 Operational Infrastructure and Water Use

Operational infrastructure for the project will include upgrades to the Starcke Highway, development of an all-weather access to the site (via one of the above access routes), construction of a 100-person camp, site offices, workshop, laboratory, crib room, amenities building, potable water treatment plant, fuel storage facilities, diesel/solar hybrid power, water supply, settling ponds and sewage treatment facilities. The utilisation of the airstrip at Cape Flattery is subject to ongoing communications with CFSM. Personnel will be transported from Hope Vale and Cooktown by bus, air or water taxi.

The source of raw water supply to site will be provided by a bore(s) located within MLA100308. Current estimates indicate an annual water supply will be required of up to 3,500ML. A breakdown of expected water usage is provided in Table 2.3 and Table 2.4.

Table 2.3 Estimated maximum annual water demand

Usage	Description	Water loss	ML/year
Processing water usage			
Product water loss	5Mtpa product to stockpile	15% water drains to ground	882
Reject sand water loss	1.33Mtpa reject sand to mine rehabilitation	40% water drains to ground	887
Fine rejects water loss	0.34Mtpa fine reject to mine rehabilitation	80% water drains to ground	1,360
Evaporation	10ha wet area	2m evaporation	20
Processing sub-total			**3,149**
Facilities and services water usage			
Accommodation camp and amenities	100-person camp, offices, work facilities	100 people x 300L/day	11
Road maintenance	Maintenance and dust control	20kL trucks, 2 per day	15
Workshops and equipment maintenance	Cleaning vehicles, machinery, equipment	30m^3 per day	11
Facilities and services sub-total			**37**
Total site water usage			3,186

Table 2.4 Estimates for water usage for 5Mtpa product

Worst case water usage	Sand:water ratio
6.67Mtpa sand mine (75% recovery to product)	100:0
5Mtpa product	85:15
1.33Mtpa reject sand	60:40
0.34Mtpa fine reject	20:80

Raw water will be pumped from the bore to the Potable Water Treatment Plant (PWTP) via a pipeline run along the site access road. Pipelines would generally consist of 100 mm diameter polyethylene mains and be

run along the ground to allow inspection and repair as required. Fire breaks to these mains would be established to prevent damage in the event of a bushfire. Water treatment will be via an Ultrafiltration (UF) Membrane water treatment plant. Disinfection would be achieved with UV and chlorination. Potable water will be treated to ensure water quality for human consumption complies with the National Health and Medical Research Council (NHMRC) Australian Drinking Water Guidelines.

After water treatment it is proposed that the potable water is stored in a proprietary steel or poly tank reservoir to provide 3 days storage in the event of source failure. The reservoir would be located approximately 200 m west of the office location close to the MLA boundary halfway up the ridge and placed on an elevated platform to achieve an elevation of approximately RL 60 m to provide sufficient head pressure. The final location will be determined during detailed design.

Runoff water from the mine infrastructure area will be stored within stormwater detention ponds and be transferred to the mine process treatment plant for the water to be re-used on site. Runoff from the network of haul roads will be captured in table drains discharges to vegetated areas via turn outs at regular intervals.

Additional to drinking water supply, up to 3 ML/yr will be required to feed mining, infrastructure and port operations. This will be based on a bore(s) within MLA100308. It is expected 80-85% of water abstracted for operations will be returned to dunes and will be confirmed through comprehensive groundwater studies.

The NSP is within the Jeannie Sub-Catchment area under the Cape York Water Plan. Under the Cape York Water Management Protocol, there is no unallocated water under the Cape York Peninsula Heritage Area (CYPHA) reserve or the general reserve. Additionally, the volume of water required for the NSP is expected to exceed the availability of water that could otherwise be obtained through trading with existing allocation holders. Therefore, Diatreme is currently seeking an allocation of water from the strategic reserve (which currently holds 25,000 ML/yr). The NSP was deemed to be a project of regional significance by the Queensland Department of Regional Development, Manufacturing and Water (RDMW) for the purposes of the *Water Plan (Cape York) 2019* in August 2023 and Diatreme can subsequently make an application for a Water Licence under the *Water Act 2000* for such an allocation in future. Note also, that in the event of a declaration of coordinated project status, provisions for a water licence would be included in the scope of the Coordinated Project EIS process (see Section 3). Applications and negotiations will continue in parallel with environmental studies to obtain the relevant allocation.

Note that there are limited alternative options for accessing water for the NSP. The principal existing allocation in the area is held directly by CFSM and is understood to be fully utilised and therefore not available for use. Other allocations are held by Aboriginal freehold landowners but at volumes less than the projected demand for the NSP. Unused allocations could be purchased from a series of other water holders but this is unlikely to be commercially unrealistic and would require the development of significant new pipeline infrastructure for the NSP.

As an alternative to Diatreme applying directly for a water licence, an equivalent application could be made by the Aboriginal freehold landowner (i.e. Hopevale Congress) to access water and provided to Diatreme for use. However, this allocation would need to be allocated directly from the strategic reserve. Thus, in either case, an allocation out of the strategic reserve would be required to access water for the NSP to proceed, based on current government allocations.

2.3.5 External Infrastructure

Outside of the proposed mining leases, the NSP will rely on the following infrastructure and services:

- Port of Cape Flattery, including port services and potential use of existing wharf infrastructure.
- Mount Webb-Wakooka Road, as the main road from which site access will occur.

- Local and regional municipal waste facilities – note that the facilities required will be dependent on detailed understanding of project waste streams and/or further discussion with relevant local councils, which will occur as part of the EIS. At present, the closest council areas providing appropriate facilities including Cook Shire, Mareeba Shire, Tablelands Region and Douglas Shire.

- Existing north-south shipping lanes connected to the Port of Cape Flattery, for the purpose of exporting product overseas (northward movements) or to other Australian ports (e.g. Townsville; southward movements).

At present, it is not intended to develop any airport infrastructure to support the NSP. Diatreme intends to limit the number of fly-in/fly-out (FIFO) personnel, thereby limiting the need for local aviation facilities. Where flights are required, these would occur through the Cooktown or Cairns airports, with travel to site via road. Some travel to site may also occur by water (subject to feasibility of water-based transport routes and distances). Where this occurs, personnel and equipment would be loaded using existing maritime infrastructure at the Port of Cooktown and unloaded at relevant infrastructure at the Port of Cape Flattery.

Diatreme does not currently propose the use of external water or electrical services but this will be finalised through further design refinement.

2.4 Alternatives Considered

The project alternatives for the NSP includes consideration of the following:

- A ‘do nothing’ option

- Alternatives for mine lease applications within the broader Diatreme exploration permit for minerals (EPM)

- Alternatives for infrastructure alignment within the proposed mine lease applications.

2.4.1 Do Nothing

As set out in Section 2.1, there is an increasing global demand for the provision of silica sand, both to meet existing and projected production of glass products and to support the growth of solar panel manufacturing as part of renewable energy transitions. While silica resource is provided across a range of different countries, the Cape Flattery region is known for the high quality of its silica resource. Additionally, the region currently supports the highest producing silica sand mine in the world. This highlights the importance of the region to global silica demand.

The NSP represents the largest prospective mine in the region, with a proposed production rate larger than the CFSM. The Si2 resource is also anticipated to be larger than any remaining resource within the CFSM mining area and thus represents the best opportunity for the ongoing production of silica in the region.

Within this context, the consequences of not developing the NSP include the following:

- Eventual cessation of silica mining activities within the region, as the CFSM reaches the end of its mine life
- Significant decrease in Australian production and export of silica sand, noting the scale of silica resource in the region is significantly larger than any other corresponding mineral province in Australia
- Potential disruption to existing silica markets, noting the prominent position of the CFSM within global markets at present
- Potential disruption to future silica markets due to the lack of increased supply to meet silica demand.
- Loss of the economic and development opportunities at local, regional and national level as set out in Section 2.1.

2.4.2 Siting of MLAs

Diatreme holds EPM 17795 Cape Bedford which encompasses a large area between Cape Bedford and Lookout Point (north of Cape Flattery). The EPM covers a series of large dune fields and is known to contain silica sand.

Under the Reef 2050 Long-term Sustainability Plan and the Queensland *Sustainable Ports Development Act 2015*, port-related activities in the Great Barrier Reef (GBR) region can only be undertaken within existing ports. Based on previous advice from regulatory agencies, any activities involving the export and/or transhipment of silica product would constitute a port-related activities. Thus, the development of a new silica project requires ready access to an existing port. For the EPM area, the only viable port that could be used for export is the Port of Cape Flattery. While the Port of Cooktown is proximate to the EPM, it is presently a non-trading port and there is limited land available for the development of an export operation.

Noting this constraint, it was necessary to locate a project at a reasonable distance to the Port of Cape Flattery. Within the EPM, the closest location to the port is along the southern boundary of CFSM's existing mine lease.

Based on exploration programs and resource estimates, Diatreme has identified two possible silica resources within this area. These are the Si2 and Casuarina mineral resources. Of these, Si2 has greater accessibility and a lower level of environmental constraint. In particular, Casuarina is expected to support a more extensive are of littoral rainforest which is identified as a sensitive vegetation community within the area.

For these reasons, Diatreme has progressed the exploration of the Si2 mineral resource and, based on the resource estimates, has developed the MLA100308 footprint to cover potential mining activities.

The siting of other infrastructure and MLAs is related to supporting the ability to access the Si2 mineral resource and provide for export through the Port of Cape Flattery.

2.4.3 Infrastructure Options

Project design refinement will occur over the course of the EIS, in response to updated understanding of the environmental, cultural and social context and through increasing detail of design. These changes are not anticipated to be significant and will relate primarily to minor relocation and scaling of infrastructure.

However, as discussed above, the NSP currently has three project components that are yet to be finalised due to the need for further commercial and design arrangements. These are:

1. Conveyor route from MLA100308 to Port of Cape Flattery – the preferred route will be subject to commercial discussions with CFSM and/or a s316 easement/transportation lease. The current alternatives are:
    a. Conveyor across ML2965 (within MLA100310)
    b. Conveyor across a 100m-wide coastal strip seaward of ML2965 (within MLA100308)
2. Access route from Mount Webb Wakooka Road – the preferred route will be subject to discussions with the landowners of Lot 8 SP104579, including any necessary MPA or other mechanisms under the *Native Title Act 1993*. These are:
    a. Starcke-Northern Silica Access 1 (MLA100311), connecting to MLA100308 across Lot 8 SP104579
    b. Starcke-Northern Silica Access 2 (MLA100312), connecting to MLA100308 via unnamed road reserve and Lot 35 SP232620

3. Maritime structures to support construction and export – the preferred structure configuration will be subject to commercial and feasibility discussions involving CFSM, Ports North and DoR. The current alternatives are:
    a. No new structures, with use of existing structures (CFSM private barge ramp, Port of Cape Flattery wharf)
    b. New barge ramp for construction and export, and limited structures (e.g. mooring dolphins) at existing wharf to support transfer to OGVs
    c. New barge ramp for construction and extension of existing wharf to support export.

These options are summarised in Table 2.5 and presented in Figure 2.5 to Figure 2.7. Note that all options are listed in order of preference.

For the purposes of the EIS associated environmental studies, each of these options will be included in the assessment. While it is preferable to adopt the least impacting option (such as the option that requires no new maritime infrastructure at the port of Cape Flattery), the referral accounts for and is seeking a determination on all relevant options. That said, where possible, a single preferred option for each component will be presented in final assessment documentation once they are determined.

In the context of maritime structures, there is current negotiations underway for a part user agreement in place between Ports North, CFSM and Diatreme. Amongst other things, this agreement is intended to assist in resolving the preferred maritime infrastructure solution for the NSP.

Table 2.5 Summary of development options

No.	Option	Subject to	Implications
Conveyor to port			
1.1	Conveyor across ML2965	Commercial arrangements with CFSM and/or s316 easement/transportation lease under *Mineral Resources Act 1989*	Reduced environmental impact through use of existing disturbed land
1.2	Conveyor across MLA100308	Alternative to 1.1	Potential impacts to coastal vegetation and landforms; corridor within or neighbouring the declared erosion prone area
Access road			
2.1	Starcke-Northern Silica Access Road 1	Land access and *Native Title Act 1993* agreements with landowners of Lot 8 on SP104579	Reduced distance and associated impacts Introduction of new landowner
2.2	Starcke-Northern Silica Access Road 2	Alternative to 2.1	Increased distance and associated impacts, including to coastal vegetation and waterways
Maritime structures			
3.1	No new structure	Commercial arrangements with CFSM (for access to private barge ramp) Commercial and feasibility arrangements with CFSM, Ports North and DoR (for use of existing jetty)	Marine impact from project limited to vessel movements
3.2	Barge ramp and limited berthing structures	Alternative to 3.1; commercial and feasibility arrangements with CFSM, Ports North and DoR	New marine impact associated with barge structure
3.3	Barge ramp and wharf extension	Alternative to 3.2; feasibility arrangements with Ports North and DoR	New marine impact associated with barge structure and extended wharf structure

LEGEND

- Conveyor Options
- ML 100308 & ML 100313
- Port Limits
- Cadastral Boundaries

Title:

Conveyor options

Figure: 2.5

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LEGEND

- Access Road Options
- Mining Leases
- Port Limits
- Cadastral Boundaries

Title:

Access road options

Figure: 2.6

Rev: A

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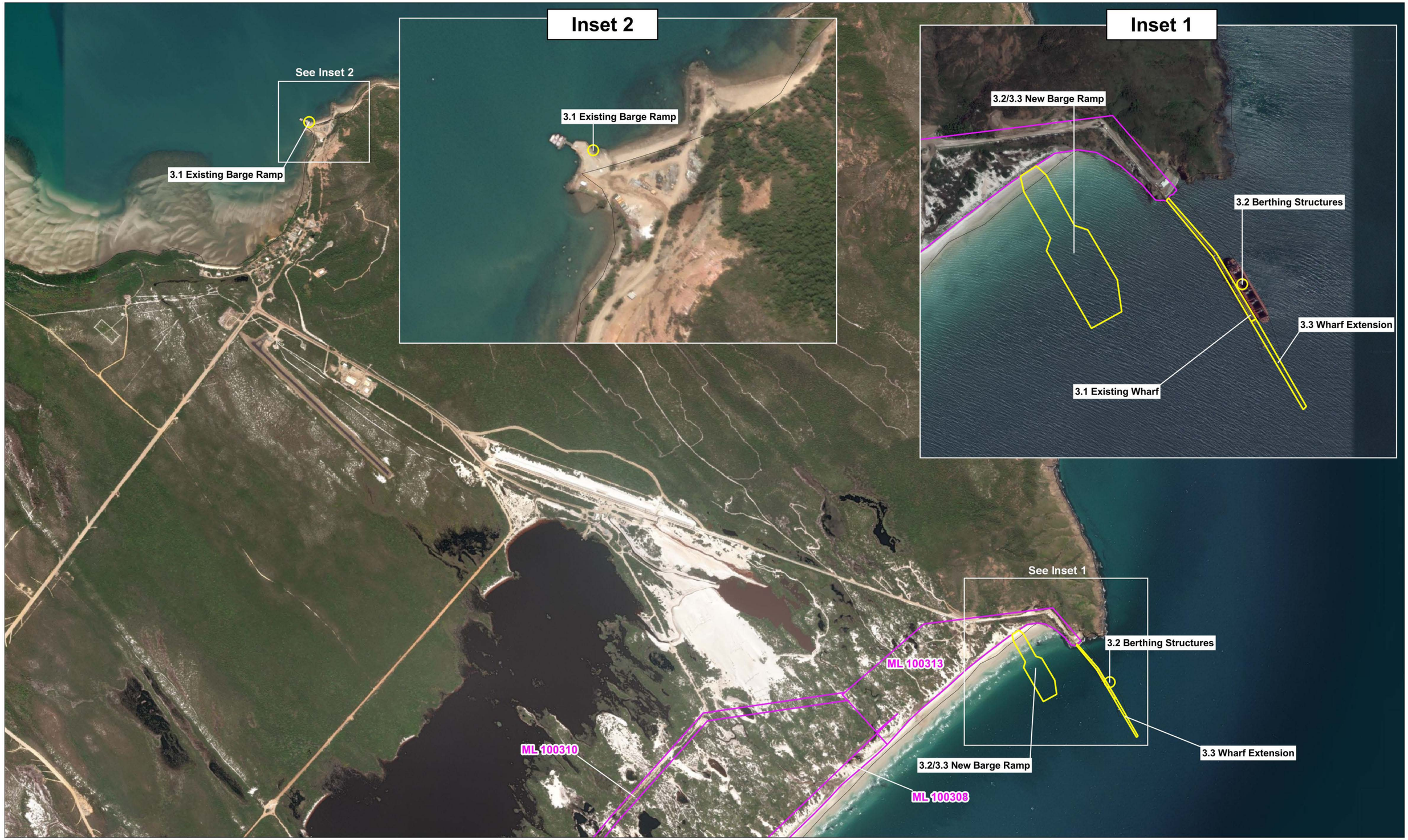

LEGEND

- Maritime Structures
- Mining Leases
- Cadastral Boundaries

Title:

Maritime structure options

Figure: **2.7**

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2.5 Land Ownership and Stakeholders

The NSP will occur across the following land:

- Lot 35 on SP232620, owned by Hopevale Congress Aboriginal Corporation – this is the sole lot on which actual mining and processing will occur and will also be covered by mining infrastructure
- Lots 9 on BS223 and 10 on BS224, owned by Ports North – these lots will be used for access to the Port of Cape Flattery and some material stockpiling
- Lot 11 on BS268, owned by Ports North – this lot contains the existing wharf structure and vessel loading area and would be used in the event that the existing wharf infrastructure is used directly or extended
- Lot 8 on SP104579, owned by Darrba Land Trust – this lot would be used as part of the preferred access road to the site.

As well as being the owner for Lot 35, Hopevale Congress is also an RNTBC for most of this area, together with the Walmbaar Aboriginal Corporation RNTBC, as shown in Figure 2.8. Lot 8 is currently subject to the Cape York United Number 1 Claim (QC2014/008), represented by Cape York Land Council Aboriginal Council, as shown in Figure 2.9 These three bodies, therefore, represent the main Native Title interests for the area.

The landside elements of the NSP occur within the Hope Vale Aboriginal Shire while the maritime elements are within Cook Shire and the port limits for the Port of Cape Flattery. The main stakeholders for these areas will be the local councils together with the communities of Hopevale and Cooktown.

Industry stakeholders for the area include Cape Flattery Silica Mines Pty Ltd, as the owner of the adjoining CFSM silica mine, Cape Flattery Silica Pty Ltd ('Metallica'), as the proponent for the nearby Cape Flattery Silica Sand Project, Big Bull Resources Ltd, and Oosen Lewis Mining Pty Ltd as the holder of a nearby exploration permit for minerals (EPM).

Figure 2.10 presents a 125km buffer around the NSP, identifying the communities for the purposes of social impact assessment in accordance with the *Strong and Sustainable Resource Communities Act 2017*. Based on this buffer, key communities are:

- Hope Vale
- Cooktown
- Rossville
- Laura
- Lakeland
- Wujal Wujal
- Bloomfield.

Figure 2.8 Area covered by RNTBCs (from Native Title Vision, November 2022)

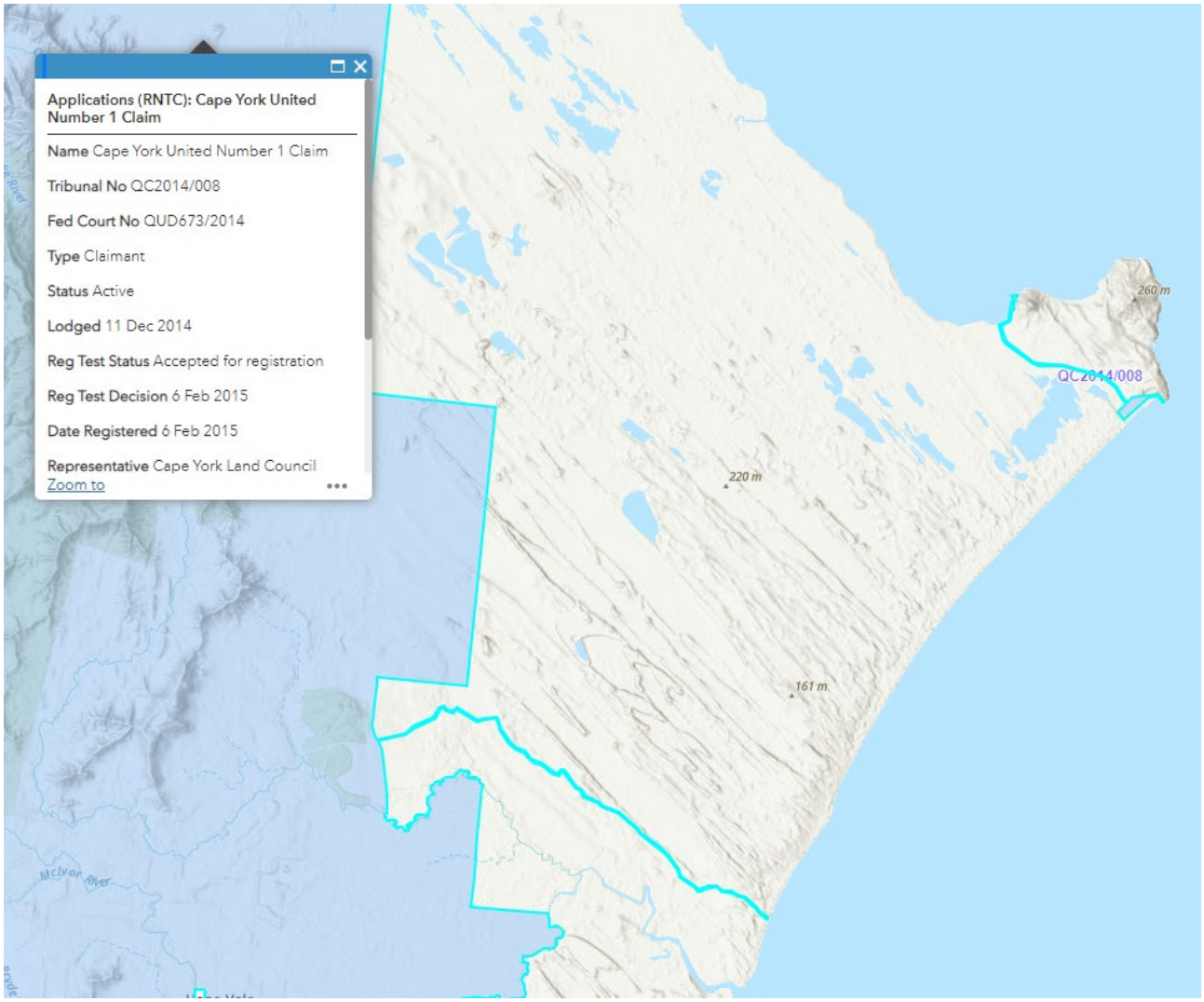
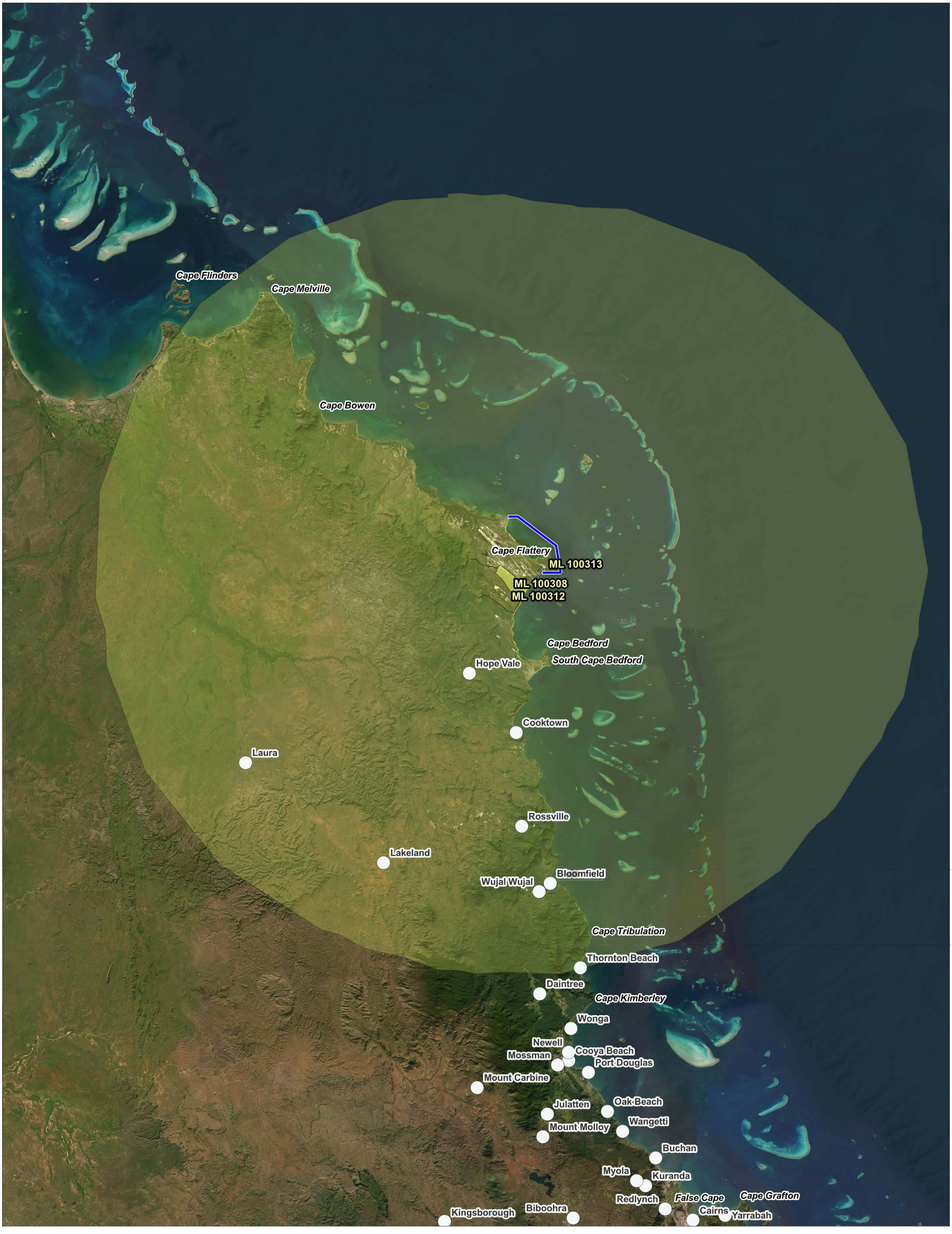


Figure 2.9 Area covered by Cape York United Number 1 Claim (from Native Title Vision, November 2022)



LEGEND

- Port of Cape Flattery Limits
- Water Plan Catchments
- MLA100308
- 125km Buffer
- Towns and Populated Places

Title:

MLA100308 125km Buffer

Figure: **2.10**

Rev: **A**

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2.6 Timing and Delivery

Background monitoring and impact assessments are currently underway for inputs required into the projects EIS. It is anticipated that a draft EIS will be completed by July 2024.

In parallel to the EIS process, advancement of the next phase of project feasibility studies and design is progressing with the first phase feasibility study to be completed in 1H 2024, followed by a second Phase 2 feasibility study to be completed following the EIS completion.

Diatreme is actively advancing discussions with potential offtake partners as well as discussions for project funding.

If approved, Diatreme intend to commence site construction by Q4 2025. Once established, mining operations will continue over the life of the mine. The current predicted mine life is 25 years, based on an established resource of 235Mt and a phased mining approach of 3.75Mtpa in years 1 and 2, shifting to 6.25Mtpa for years 3 through 25. Depending on the rate of mining and any changes to the resource estimate this may further expand over time but would be subject to relevant approval application and amendment processes.

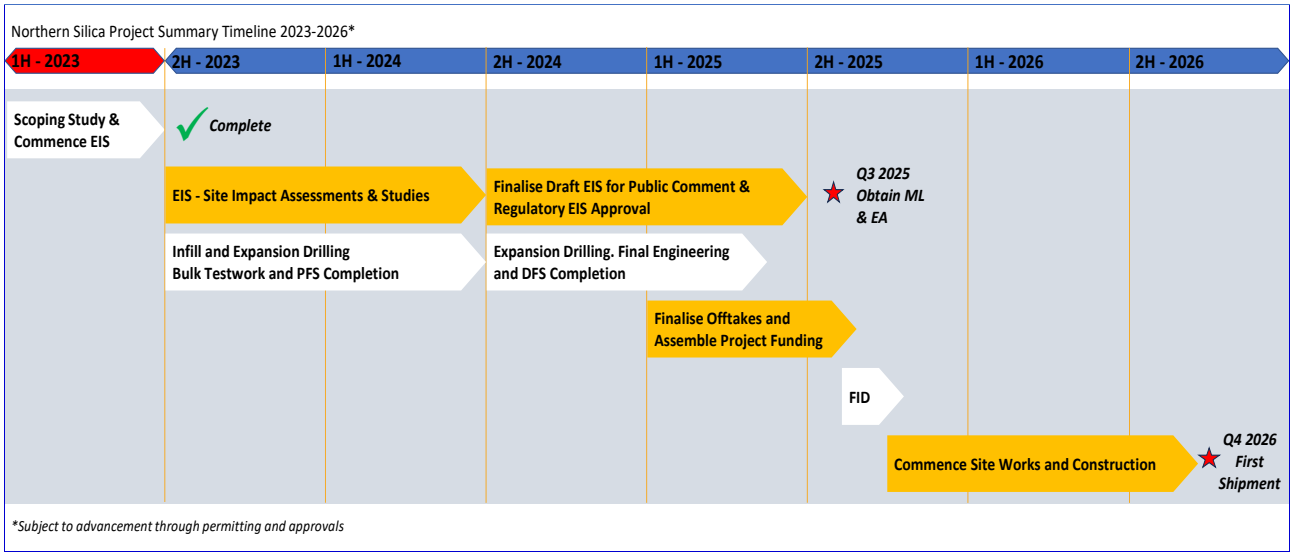

Figure 2.11 Indicative project and EIS timeframe

2.7 Proponent

The proponent for the project is Northern Silica Pty Ltd (ABN 44 659 896 653), a wholly-owned subsidiary of Cape Silica Holding Pty Ltd (ABN 45 659 896 189), both of which are controlled by ASX listed Diatreme Resources Ltd (Diatreme) (ABN 33 061 267 061). Cape Silica Holdings Pty Ltd is a Joint Venture (JV) between Diatreme (73.2%) and Sibelco (26.8%).

Diatreme is located at Unit 8, 61 Holdsworth Street, Coorparoo QLD 4151. Sibelco corporate headquarters is located at Plantin en Moretuslei 1a, 2018 Antwerpen, Belgium. Sibelco's Australian address is PO Box 47, Dunwich, QLD 4183.

Diatreme is a publicly listed company (ASX code DRX) with interests in prospective mineral and silica sand projects in Queensland and Western Australia.

Since 2019, Diatreme has also been involved in the planning and approvals for the Galalar Silica Sand Project (GSSP), located east of Hopetown township between Cape Bedford and Nob Point. However, it

should be noted that the NSP, following extensive exploration, resource definition and export optionality studies has become Diatreme's priority for development. In accordance with this, the EIS process for the GSSP has currently been withdrawn (including withdrawing of referral EPBC 2020/8626). Whilst the GSSP's established resource remains important to Diatreme, the development timeline for the GSSP will occur after the NSP becomes fully operational.

Diatreme has not committed any breaches of environmental legislation in the States that it has operated in nor under Commonwealth law. To date, Diatreme has undertaken exploration activities across its Exploration Permit for Minerals (EPM) within the Cape Bedford region and targeted investigations for the GSSP (located south of Northern Silica) without any instance of environmental harm or nuisance. Diatreme works closely with local indigenous organisations Hope Vale Aboriginal Congress (HVAC) and Walmbaar Aboriginal Corporation (WAC) to ensure that all exploration and mine planning works respect local indigenous heritage and land access arrangements.

Diatreme currently has adopted an Environment Policy (see below) and a Sustainability Policy to govern all of its operations. Under these policies, Diatreme has committed to the following key actions:

- Benchmarking of new silica projects against the Initiative for Responsible Mining Assurance (IRMA) Standard for Responsible Mining 2018 and Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability (IS) Rating Tool
- Preparation of an ISO14001 accredited Environmental Management System to govern all Diatreme activities, including at a mine-operational level
- Development of project-specific management plans to govern all relevant aspects of mining activities, including infrastructure construction, mining and processing, maritime operations, cultural heritage, social impact and progressive closure and rehabilitation.

Additionally, under the Environment Policy, Diatreme has made the following key commitments:

- Complying with the requirements of all relevant legislation and regulations and applying responsible standards where laws do not exist
- Managing environmental risk, ensuring that all material risks are identified, objectively assessed, monitored and responded to in an appropriate manner
- Minimising environmental impacts through the implementation of environmental management plans for operational activities
- Preventing pollution, and developing response plans for emergency situations
- Reducing our environmental footprint by efficient use of resources, management of water and energy consumption and management of waste and emissions
- Continually improving environmental management practices and performance
- Developing a workplace culture where all personnel, consultants and contractors understand and appreciate their environmental responsibilities.

Environmental Policy

Purpose and Scope

Diatreme Resources is committed to the objective of achieving best environmental practices by setting compliance with relevant legal obligations as the minimum standard for environmental performance.

At Diatreme, we are committed to the goal of sustainable development where a balance of social, economic and environmental considerations are taken into account. We aim to minimise impacts on the environment across all our operations.

Our Commitment

Diatreme Resources aims to achieve these by:

Specifically, we will:

- comply with the requirements of all applicable environmental laws, regulations and requirements and apply standards where laws do not exist
- understand the environmental risks associated with our activities and strive to conserve local biodiversity and natural environments
- develop a culture of environmental responsibility by engaging our workforce
- prevent pollution and develop response plans for emergency situations
- reduce our environmental footprint by efficient use of resources, management of water and energy consumption and management of waste and emissions
- develop a culture of environmental responsibility by engaging our workforce and promoting effective communications, including the prompt reporting of environmental incidents
- manage land to limit disturbance and rehabilitate areas in accordance with environmental permits
- implement appropriately resourced environmental systems and monitor, audit and review performance to enable continuous improvement of our environmental practices
- Undertake training and awareness that promotes good environmental governance and practices.

This Policy is to be communicated to all our employees, contractors and visitors and the Policy statement shall be displayed at the workplace.

Neil McIntyre
Chief Executive Officer,
Diatreme Resources Limited
Issued: August 2021
Review Date: August 2022

Policy
Document Number: DR-POL-HSEC-001|Version 1.0 | Date Published: 8August 2021
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3 Approvals and Assessment Context

3.1 Approvals Required

A series of approvals will be required for the NSP, including the Coordinator-General's Evaluation Report (CGER) under the SDPWO Act and Controlled Activity Approval under the EPBC Act. These approvals can be split based on their scope of application as follows:

Project-wide authorisations

- CGER and associated approval and conditions imposed under the SDPWO Act
- Controlled Activity Approval under the EPBC Act
- Native Title Agreements/MPAs under the *Native Title Act 1993*
  - Diatreme is intending to undertake a Right to Negotiate process under the Native Title Act which will be integrated into the broader MPAs
  - MPAs will be required with the relevant RNTBCs and Traditional Owner representative groups associated with mining activities on MLA100308
- Cultural Heritage Management Plans (CHMPs) under the *Aboriginal Cultural Heritage Act 2003* (ACH Act) with each of the RNTBCs across the Project Area
- Social Impact Assessment (SIA) and Social Impact Management Plan (SIMP) under the *Strong and Sustainable Resource Communities Act 2017* (SSRC Act)

Mine site approvals

- Environmental Authority (EA) under the *Environmental Protection Act 1994* for a resource activity, including the following associated environmentally relevant activities (ERAs):
  - ERA 31 mineral processing
  - ERA 8 chemical storage
  - ERA 63 sewage treatment
- Mining Lease and Mine Infrastructure Leases, including (potentially) a s316 Agreement, under the *Mineral Resources Act 1989* (MR Act)
- Water licence (or equivalent) under the *Water Act 2000*
- Various permits for protected species (e.g. Species Management Plans, Protected Plant Permits) as necessary under the *Nature Conservation Act 1992* (NC Act)

Export operation approvals

- EA under the EP Act for ERA 50 mineral and bulk material handling
- Development Permit for tidal works under the *Planning Act 2016* and *Coastal Protection and Management Act 1995* (Coastal Act).

Table 3.1 provides a detailed list of State approvals relevant to the NSP, including relevant agencies and assessment benchmarks.

To the extent vegetation clearing is covered under the scope of the resource activitiy EA, a Development Permit for clearing under the *Planning Act 2016* and the *Vegetation Management Act 1999* would not be required. All vegetation clearing necessary for the Project is therefore intended to be covered in the scope of the EIS and EA. However, in the event that further clearing of regulated vegetation is required in the future, this would require a s22A determination under the Vegetation Management Act and a Development Permit under the Planning Act.

Table 3.1 NSP approval requirements

Legislation	Approval	Project element	Administering authority	Assessment benchmarks / guidelines	Coordinated project EIS scope
SDPWO Act	Coordinator-General's Evaluation Report	Whole of project	Office of the Coordinator-General	ToR issued for the project	Yes – seeking imposed conditions
ACH Act	CHMPs	One for each Aboriginal Party within the overarching project	Native Title body / Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	CHMP guidelines	No – to be developed in parallel with the EIS
SSRC Act	SIA and SIMP	While of project	Office of the Coordinator-General	SIA and SIMP guidelines	Yes – assessed as part of the EIS
EP Act	Resource EA and EAs for ERA 31, 8 and 63	Mining activities and mining infrastructure, including vegetation clearing	DES	EP Act / EP Regulation requirements / Mining Model Conditions (as applicable)	Yes – seeking stated conditions
EP Act	EA for ERA 50	Export	DES	EP Act / EP Regulation requirements	Yes – seeking stated conditions
EP Act	PRCP	Mining activities	DES	Guideline ESR/2019/4964 Progressive rehabilitation and closure plans	Partial – seeking stated conditions associated with rehabilitation to align with PRCP but recognise actual PRCP approval is granted alongside EA
Water Act	Water licence	Water extraction and use	RDMW	N/A	Yes – seeking stated conditions or recommended stated conditions

Legislation	Approval	Project element	Administering authority	Assessment benchmarks / guidelines	Coordinated project EIS scope
Planning Act	Development Permit for concurrence ERA	Mining activities, export	State Assessment and Referral Agency	State code 22	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for tidal works	Maritime infrastructure	Ports North / State Assessment and Referral Agency	State code 7 and state code 8 Port of Cape Flattery Land Use Plan and development codes	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for waterway barrier works	Infrastructure crossings of waterways	State Assessment and Referral Agency	State code 18	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for marine plant disturbance (if applicable)	Clearing of marine plants	State Assessment and Referral Agency	State code 11	Yes – seeking stated conditions or recommended stated conditions
NC Act	Protected Plant Permit	Clearing or translocating protected plant species	DES	Protected Plants Assessment Guidelines	No, but to be considered in general recommendations for the CGER
NC Act	Species Management Program	Affecting the breeding habitat of a species	DES	Information sheet: Requirements for tampering with a protected animal breeding place in Queensland	No, but to be considered in general recommendations for the CGER
Environmental Offsets Act	Agreed Delivery Arrangement	Any significant residual impact	DES	Significant Residual Impact Guidelines	Yes – EIS to include a biodiversity offset strategy or equivalent if required

The EIS and the SIA and SIMP will occur as an integrated activity as part of the coordinated project EIS process. The EIS will also contain the relevant material for assessment and a decision on the controlling provisions under the EPBC Act for the Controlled Activity Approval. Thus, these approval activities are completely integrated. Similarly, the decision on the EIS approval provides the basis for the resource activity EA application and associated Mining Lease (ML) and Mine Infrastructure Lease (MIL), together with a range of downstream approvals.

The Native Title Agreements/MPAs and CHMPs will be developed and negotiated in parallel with the EIS process, with the CHMP development being informed by any cultural heritage assessments under the EIS.

These approvals collectively, therefore, represent the primary and secondary approvals required for the NSP. These approvals provide the fundamental permission context and represent the bulk of environmental, social and cultural assessments.

Development Permits, the EA for export operations and species permits are tertiary approvals as they relate primarily to operationally specific activities that can only be resolved through more detailed design post-EIS.

The preferred approvals pathway for water access is to obtain access to the strategic reserve under the *Water Plan (Cape York) 2019*. The Queensland Government approved the NSP as a project of regional significance under the Water Plan in August 2023. Subsequent application for a water allocation would occur in parallel with the EIS phase and be informed by outputs of the EIS. Alternative access options are also being considered.

For the purposes of the Coordinated Project process, it is anticipated that the following approvals would be considered as part of the EIS process:

- EA for resource activity, including associated ERAs
- EA for ERA 50
- Water licence
- Development Permit for tidal works.

3.2 MNES Features

The NSP was determined a 'controlled action' under the EPBC Act by the Australian (federal) Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 14 June 2023. DCCEEW has deemed that the NSP constitutes a controlled action under the EPBC Act for the matters listed in Table 3.2.

The matters listed for the NSP principally consist of marine/coastal species and matters (e.g. turtles, shorebirds, dolphins, sharks, dugong, crocodile, ray) but also includes littoral rainforest and orchid, bat and terrestrial reptile species that may use the heath and forest communities of the area. Many of these threatened and migratory species are also listed under Queensland legislation, as discussed in Section 4.6.

The determination also includes GBR World Heritage Area (GBRWHA), National Heritage Place (GBRNHP) and Marine Park (GBRMP). NSP infrastructure occurs within the GBRWHA and GBRNHP but not within the GBRMP. Despite this, the GBMP has been included to capture the proposed ship movements that would be facilitated by the project through the marine park.

Table 3.2 Matters identified as controlling provisions for NSP EPBC Referral decision

EPBC Act controlling provision	Matter
World Heritage properties (ss12&15A)	Great Barrier Reef World Heritage Property
National Heritage properties (ss15B&15C)	Great Barrier Reef National Heritage Place
Listed threatened species and ecological communities (ss18&18A)	**Threatened ecological communities** • Littoral Rainforest and Coastal Vine Thickets of Eastern Australia – Critically Endangered **Threatened flora** • Ant plant (*Myrmecodia beccarii*) – Vulnerable • Chocolate teatree orchid (*Dendrobium johannis*) – Vulnerable • Cooktown orchid (*Vappodes phalaenopsis*) – Vulnerable • *Eremochloa muricata* – Endangered **Threatened mammals** • Bare-rumped sheath-tailed bat (*Saccolaimus saccolaimus nudicluniatus*) – Vulnerable • Ghost bat (*Macroderma gigas*) – Vulnerable • Large-eared horseshoe bat (*Rhinolophus robertsi*) – Vulnerable **Threatened birds**

EPBC Act controlling provision	Matter
	• Australian painted snipe (*Rostratula australis*) – Endangered • Crimson finch (white-bellied) (*Neochmia phaeton evangelinae*) – Endangered • Curlew sandpiper (*Calidris ferruginea*) – Critically Endangered, Migratory • Eastern curlew (*Numenius madagascariensis*) – Critically Endangered, Migratory • Great knot (*Calidris tenuirostris*) – Critically Endangered, Migratory • Greater sand plover (*Charadrius leschenaultii*) – Vulnerable, Migratory • Lesser sand plover (*Charadrius mongolus*) – Endangered, Migratory • Red knot (*Calidris canutus*) – Endangered, Migratory • Western Alaskan Bar-tailed godwit (*Limosa lapponica baueri*) – Vulnerable **Threatened reptiles** • Flatback turtle (*Natator depressus*) – Vulnerable, Migratory • Green turtle (*Chelonia mydas*) – Vulnerable, Migratory • Hawksbill turtle (*Eretmochelys imbricata*) – Vulnerable, Migratory • Leatherback turtle (*Dermochelys coriacea*) – Endangered, Migratory • Loggerhead turtle (*Caretta caretta*) – Endangered, Migratory • Olive Ridley turtle (*Lepidochelys olivacea*) – Endangered, Migratory • Yakka skink (*Egernia rugosa*) – Vulnerable **Threatened sharks** • Freshwater sawfish (*Pristis pristis*) – Vulnerable, Migratory • Green sawfish (*Pristis zijsron*) – Vulnerable, Migratory • Whale shark (*Rhincodon typus*) – Vulnerable, Migratory
Listed migratory species (ss20&20A)	**Migratory mammals** • Dugong (*Dugong dugon*) **Migratory reptiles** • Salt-water crocodile (*Crocodylus porosus*) **Migratory sharks** • Narrow sawfish (*Anoxypristis cuspidata*) **Migratory rays** • Reef manta ray (*Mobula alfredi*) • Giant manta ray (*Mobula birostris*) **Migratory cetaceans** • Australian snubfin dolphin (*Orcaella heinsohni*) • Australian humpback dolphin (*Sousa sahulensis*)
Great Barrier Reef Marine Park (ss24B724C)	Great Barrier Reef Marine Park

3.3 EIS Pathway

Coordinated project declaration is now being sought under the SDPWO Act for the project, with the intent of progressing an EIS. If declaration is achieved, the EIS for the proposed project will be jointly assessed under the SDPWO Act and the EPBC Act in accordance with the assessment bilateral agreement between the Australian Government and the State of Queensland. This aligns with the preferred assessment pathway noted by DCCEEW as part of the determination for the project (Section 3.2).

While subject to a range of factors moving forward that could alter the dates listed below, the intended programme for development of the EIS is currently set out as follows:

- Coordinated project determination application and declaration – expected Q3/Q4 2023
- Publication of Draft ToR for public comment – expected Q4 2023 or Q1 2024
- Publication of Draft EIS for public comment – expected Q4 2024
- Response to submissions and submission of the amended EIS – expected Q1 2025
- Preparation and release of the Coordinator-General's Evaluation Report – expected Q2 2025.

NOTE: on 23 January 2023, DES approved an application for Diatreme to voluntarily prepare an EIS under the EP Act. However, to date, Diatreme has not formally commenced this EIS process under the EP Act in favour of awaiting a decision on the Coordinated Project pathway.

3.4 Stakeholder Consultation

Diatreme has developed a draft Stakeholder Engagement Plan, Community Engagement and Communications Strategy, and Community Engagement and Communications Plan for the project that set out the approach for consultation with all project stakeholders, including affected and interested persons.

As part of the (SEP) plan, the following key stakeholders and associated level of engagement have been identified:

- Hopevale Congress Aboriginal Corporation (Congress) as holder of the Aboriginal Freehold in trust for the people particularly concerned with the land in accordance with the *Aboriginal Land Act 1991* (Qld) (ALA). Congress is additionally included as the RNTBC holding native title rights and interests over some areas within the NSP.
- Walmbaar Aboriginal Corporation RNTBC (Walmbaar) holds the native title rights and interests over the vast majority of the NSP The role of Walmbaar in the project will be formalised through the development of a mining project agreement.
- Darrba Land Trust as holder of Aboriginal Freehold in trust for the people particularly concerned with the land in accordance with the ALA. The role of Darrba will be formalised through the development of a mining project agreement.
- Cape York United Number 1 Claim (QC2014/008), represented by Cape York Land Council Aboriginal Council – Native Title applicant for a portion of the land on which the project will occur. The role of CYLC in the project will be formalised through the development of a mining project agreement.
- Hope Vale and Cooktown communities – direct consultation throughout the EIS process, including regular project updates and opportunities for direct engagement through Diatreme office presence in both townships
- Far North Queensland Ports Corporation Limited (Ports North) – collaboration in decision-making on the project, primarily in the context of export solution
- Cape Flattery Silica Mines Pty Ltd (CFSM) – collaboration in the context of neighbouring land use and on agreement to access the Port through ML2965
- Cape Flattery Silica Pty Ltd (Metallica) - collaboration in the context of neighbouring land use.
- Big Bull Resources Ltd - collaboration in the context of neighbouring land use.
- Oosen Lewis Mining Pty Ltd – collaboration in the context of neighbouring land use.
- Government agencies including the relevant local councils (Hopevale Aboriginal Shire and Cooktown Shire) – involvement and direct consultation through the EIS process, including regular project updates. This may also include technical consultation, such as engagement with the Department of Agriculture and Fisheries (DAF) and/or RDMW regarding the designation of water features as waterways for waterway barrier works and/or watercourses.

Diatreme already has extensive connections with local stakeholders as part of the engagement undertaken for the GSSP. Additionally, Diatreme has staff located with Hope Vale and Cooktown who will be able to facilitate and support active engagement with local stakeholders.

Consultation and engagement are likely to occur through the following processes:

- Notifications via letters and emails to interested and affected persons
- Notification of statutory submission periods through newspaper advertisements and announcements
- Face to face meetings with stakeholders and interested persons
- Operation of local offices in the region where interested parties can obtain further information about the project and/or interact with Diatreme staff
- Posting information about the project including project updates and fact sheets on the company website (www.diatreme.com.au)
- Maintaining a dedicated project email account and telephone contact number (1 800) for enquiries
- Providing information about the project on websites maintained by the Queensland Government (DES) and Australian Government (EPBC)
- Release of information through ASX media releases.

The SIA and SIMP process (required by the EIS) will be undertaken as a subset of the broader stakeholder consultation and engagement plan being implemented by Diatreme in the region.

This process will include:

- Appointment of a suitably qualified social impact consultant
- Undertaking required baseline assessments and data collection to characterise the profile of potentially impacted communities, and analysis of key stakeholders, a summary workforce profile for the construction and operational phases of the project and other required baseline tasks set out in the SIA guidelines
- Undertaking SIA-focused meetings and workshops with key stakeholders during the draft EIS preparation phase
- Preparation of the draft SIA and associated social impact management plan that are incorporated into the Draft EIS that is publicly notified

As outlined in the SIA guidelines, the SIA consultation and engagement process will provide specific information around the following matters:

- Community and stakeholder engagement
- Workforce management
- Housing and accommodation
- Local business and industry procurement
- Health and community well-being

This will be done to address the EIS requirements but also inform Diatreme's broader community engagement and development programs which are on-going.

4 Environmental Matters and Impact Assessment

This section sets out a description of the existing environmental, social and economic values associated with the NSP. This includes a summary of potential risks to relevant components of the environment and how these will likely be addressed as part of the EIS for the project. The intent is to better characterise key risk areas that are of higher priority for assessments. This in turn will inform the eventual development of ToR for the EIS.

4.1 Site Overview

The Cape Flattery area is under the Köppen classification system, located within a tropical climate area and characterised by hot, humid, and wet summers and dry winters (EMM, 2023). Using data obtained from Scientific Information for Landowners (SILO) database, long term rainfall statistics indicate the summer and autumn months (December to April) are generally the wettest, with an average annual rainfall between 1970 to 2022 of 1,532 mm and average annual evaporation of 1,976 mm within the Project Area.

The geology of the area is dominated by Cenozoic aged sandy sediments overlying Mesozoic sedimentary units and Palaeozoic metamorphic and volcanics sediments (based on the Cooktown 1:100,000 Geological Map). A preliminary desktop review indicates that the Project Area is located within the Quaternary aged Cape Flattery dunefield, that extends up to 10km inland from the current coastline and stretches approximately 50km in a meridional direction (EMM 2023). The sand dune complex was probably developed from blow outs that have evolved over time due to south-easterly winds, establishing large transgressive elongate parabolic sand dunes (Diatreme, 2019).

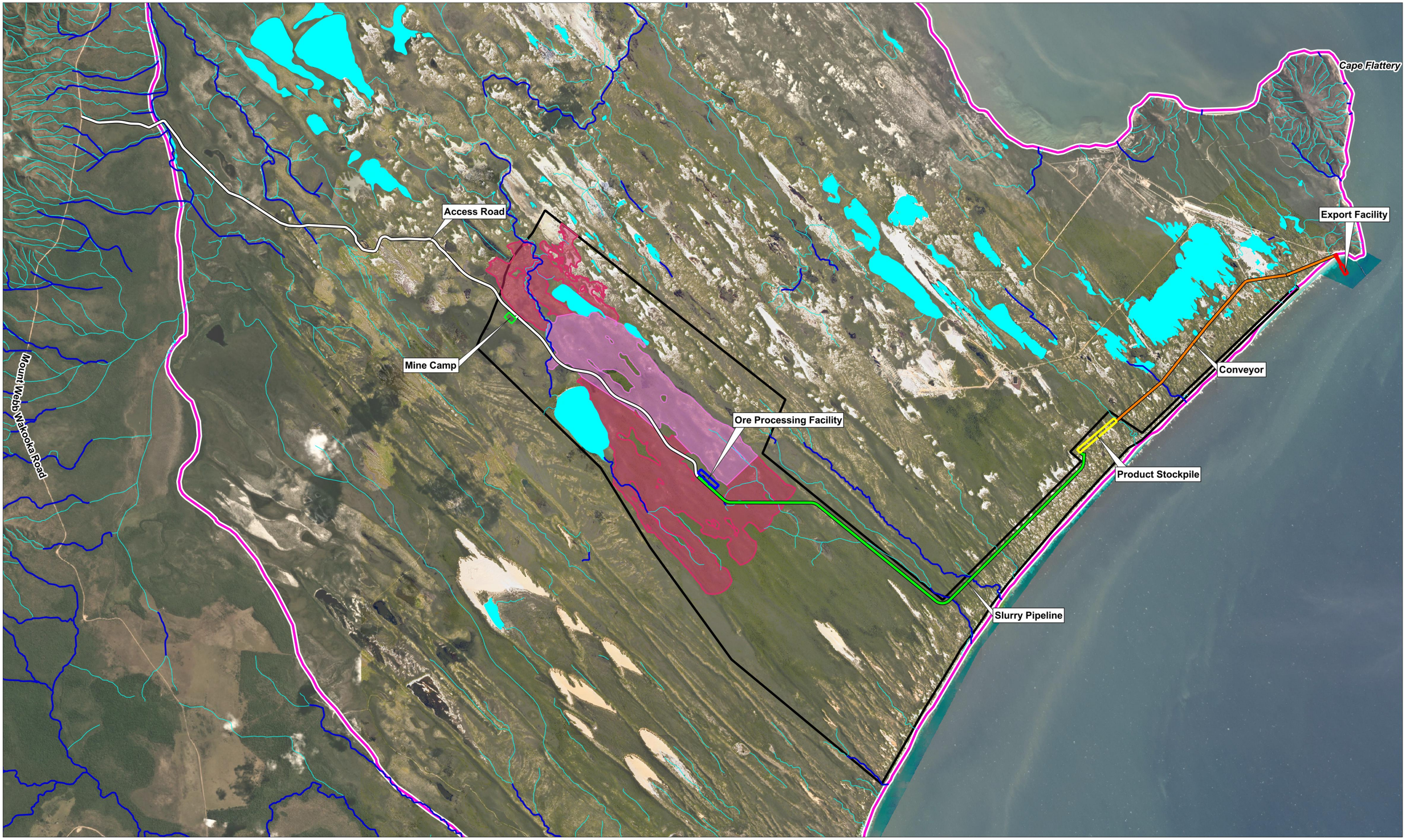
The Project Area is within the Cape Flattery Dune Lakes area of the Jeannie River basin, as defined in the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*. The Jeannie River Basin is 3,000km^2 and located along the southern section of the Cape York Region, along the eastern coast of Cape York Peninsula. Within the Project Area there are two main catchments, formed by the ridge along the coastal foredunes. Seaward of this ridge there are several small coastal creeks, providing surface drainage of the foredunes as well as capturing and groundwater infiltrating through the dunes. Landward of the ridge, there are a series of larger waterways, including ephemeral and permanent features, together with wetlands and lakes. These features are not connected to any significant watercourse in the area but rather provide surface drainage from rainfall. Water from these systems drains into the dunes and underlying groundwater system. These features are noted as ‘unmapped’ under the Queensland *Water Act 2000*, indicating that further assessments are required by RDMW to determine if the features are ‘watercourses’ or ‘drainage features’ for the purposes of the Act.

A series of water features that could also be waterways for waterway barrier works under the *Fisheries Act 1994*, including both mapped and unmapped features. These will require assessment to determine if they provide sufficient habitat features and/or fish passage characteristics to qualify as a relevant waterway. Any designation of a waterway other than as mapped would require consultation with DAF to confirm.

The Project Area is located within the Cape Flattery Dune Lakes, which is a listed wetland of national importance on the Directory of Important Wetlands in Australia (DIWA) (No. QLD059). While this is not a legally-binding listing, it recognises the significance of the area. The DIWA listing for the site includes the following site description (DCCEEW, 2019):

> *The wetlands of this site are located in the largest dune field on the east coast of Australia, north of Fraser Island. The wetlands are comprised of a number of freshwater lakes and palustrine wetlands located in dune swales. There are also beaches, mangroves and salt flats. The largest of the dune lakes exceed 1km^2 in area, and many are permanent, providing dry season refuges for waterbirds and breeding habitats for numerous species of wildlife. The dunes carry a diverse vegetation cover, ranging from heath to rainforest. This provides a variety of habitats for wildlife.*
>
> *…*
>
> *The site has values of international significance; it contains the best development of gegenwalle (Counter-wall) dunes in the world and is one of the few areas in the world with extensive development of large elongate parabolic dunes. While these features are not strictly wetland features they have a significant effect on the wetland values of the area as these dunes are the structures in which the wetlands occur. A large proportion of the site has high wilderness quality. It contains some of the best examples of dune lakes in Australian and the largest diversity of dune landforms of any of the dune systems in northern Australia. The invertebrate diversity of the lakes is very high and includes a number of endemics.*

Within the Project Area, there is a large dune lake that forms part of the network of lakes included within the Cape Flattery Dune Lakes designation. This lake is 0.85km^3 in size, and is fed by a combination of surface water drainage/rainfall and groundwater. Across the broader area, there is a shallow unconfined Quaternary sand dune aquifer which contributes to surface expressions within the dune lake system, overlying a deeper unconfined to semi-confined aquifer associated with alluvium. See further Section 4.4 for a description of the hydrogeology and surface water characteristics of the Project Area.



LEGEND

- Access Road
- Slurry
- Conveyor
- Product Stockpile
- Export Facility
- Ore Processing Facility
- Revised NRP MLA
- CFP Onshore Lease
- Si2 indicated category mineral resource (March2023)
- Si2 inferred category mineral resource (March2023)
- Cape Flattery Dune Lakes (DIWA nationally important wetland)
- Queensland waterways for waterway barrier works
- Watercourse Lines
- Lakes / Waterbodies

Title:

Surface Water Features of the Project Area

Figure: 4-1

Rev: A

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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4.2 Land

The Project Area consists of a series of dune fields, forming part of a broader dune landscape formed between Cape Bedford and Cape Flattery. It is primarily undisturbed at present, except for minor access tracks. However, it is located adjacent to the largest silica mine in the world, which features a mosaic of undisturbed, rehabilitating and active mining areas.

Existing information relating to soils and land resources is primarily contained in *Soils of Cape York Peninsula* (Biggs & Philip, 1995). This mapping (undertaken at a low-resolution scale of 1:250,000) shows the proposed Project Area to be mapped uniformly as the Daunt soil unit. The Daunt soil consists of Aeric Podosols, giant (>5 m) uniform sands that would likely be classified as Arenosols under the current *Australian Soil Classification – 3rd Edition* (Isbell & NCST, 2021). The Daunt unit is found only in the dunefields of the east coast of Cape York. A Giant Podosol, its nature probably varies in a similar manner to that of the Doughboy soil unit, i.e. as a result of landscape position. Location within the dune system may also have a significant bearing on depositional or erosional forces acting on soils. It is noted that blowouts are a significant feature of the dune system. Only one site was described for Daunt by Biggs & Philip (1995), due to the inaccessibility of the dunes. It consisted of a thin dark A1 overlying an extensive (15 m) bleached sand A2 below which were sesquic B2 horizons spanning nearly 5 m. Bleached 2A2 horizons and sesquic and humosesquic horizons are found below the B2. Vegetation on the dunefields is predominantly heath, but it may be lacking in active blowouts. Perched lakes are very common (Biggs & Philip, 1995).

According to national acid sulphate soils (ASS) mapping, visible at a 1:2,000,000 scale, *Atlas of Australian Acid Sulphate Soils* (Fitzpatrick, Powell, & Marvanek, 2011), the Project Area is predominantly outside of mapped risk areas. However, areas of low and high probability (C and A probability codes, reflecting <5% chance and >70% chance of occurrence) are present in proximity to the coast. Areas of code A are also mapped in association with inland lakes, waterways, wetlands and riparian zones in proximity to the Project Area. Given the presence of the same features within the Project Area, there is the potential for ASS occurrence in these areas.

The Project Area does not have any known sources of contamination from prior industrial or agricultural activities.

While the Project Area is mapped as ‘rural’ under the local planning scheme, it does not have any active agricultural activities.

There are several national parks within Cape York Peninsula in the broader study area but not expected to be affected by the NSP in any way. These parks are mapped in Figure 4.2.

LEGEND

Land Boundaries

Project Elements
Camp, CFP Onshore Lease, Process and Infrastructure, Infastructure Corridor, Revised NRP MLA Stockpile 1 & 2

Si2 Nth Extension Drilling

Si2 Nth Resource

Title:

Local National Parks and Cape York Peninsula Aboriginal Land

Figure: 4.2

Rev: A

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Impacts and Assessment Requirements

The development of the project will involve the surface excavation of sand resource across MLA100308, together with other surface disturbance associated with access tracks, processing plant and other project infrastructure. While there will be progressive rehabilitation of the land throughout the project, there will be a net loss of material with a resulting change in the landscape. Despite this, it will be possible to establish a stable landscape after excavation through the minor earthworks and revegetation works. This contrasts to hard rock quarries and mining operations which are more geotechnically constrained. Similarly, there will be no tailings or waste rock stockpiles that will need to be managed as part of rehabilitation works.

Excavation and disturbance in low-lying areas (e.g. near waterways and wetlands) may contain ASS. If disturbed without appropriate management, this may lead to oxidation of ASS and generation of acidic material.

Excavation poses a minimal risk of erosion and downstream sedimentation as the material will primarily be sandy. Despite this, standard erosion and sediment controls (ESC) will be required to minimise risks in areas upstream of waterbodies and/or for stockpiles of finer material (e.g. stockpiles topsoil). Clearing and excavation will disrupt the landscape, however, and will require management to ensure impacts to the dune systems does not spread beyond the mining footprint. This will be achieved through the implementation of mining-specific ESC measures and land stabilisation techniques (e.g. placement of matting) together with progressive rehabilitation activities, in accordance with a detailed PRCP.

As it is unlikely that any agricultural activity will occur at the site into the future, due to the unsuitability of native vegetation for grazing or growing activities, it will not be necessary to undertake a land evaluation or other assessment of agricultural potential.

Noting the above, the intended focus for the EIS will be:

- Testing and characterisation of soils, in parallel with geotechnical investigations for project design, with a key focus on identifying the potential presence of ASS
- Developing a risk-based approach to ESC and stormwater management
- Developing a PRCP based on the soils, landscape and vegetation of the area
- Assessing visual impacts associated with changes in the broader landscape
- Identifying infrastructure to remain in place post-mining compared to areas that will be closed by the end of the project.

4.3 Rehabilitation

The project will be subject to a PRCP to provide a detailed strategy for the progressive rehabilitation of mining cells, with the intent to return the landscape to its natural (vegetated) state with no legacy development or alternative use of the site. Rehabilitation within a dune/sand-based landscape focuses primarily on reforming stable dune landforms, where practicable, supported by stages of revegetation to reestablish native communities. For majority of the mining area, this will focus on heath communities, consistent with the pre-clearing communities. All mining infrastructure would be removed with the possible exception of select maritime infrastructure created for the project as negotiated with Ports North and the underlying Aboriginal landowners.

Impacts and Assessment Requirements
A PRCP will be developed as part of the EIS/EA process for the project.

4.4 Water

4.4.1 Water Quality

Water features associated with the Project Area are shown in Figure 4.1.

The coastal and onshore waters of the Project Area are included in the scheduled environmental values (EVs) and water quality objectives (WQOs) for the Jeannie and Endeavour River Basins (DES, 2020). Within landside areas, surface waterways are mapped as slightly disturbed freshwaters while all natural lakes are mapped as high ecological value (HEV) dune lakes or slightly disturbed wetlands (palustrine). Offshore waters within port limits are mapped as open coastal waters. EVs for these different water types are:

- Cape Flattery dune lakes – aquatic ecosystems, human consumer, visual recreation, cultural and spiritual values
- Port of Cape Flattery (land side) – aquatic ecosystems, human consumer, visual recreation, industrial use, cultural and spiritual values
- Coastal creeks – aquatic ecosystems, irrigation, farm supply/use, stock water, human consumer, primary recreation, secondary recreation, visual recreation, drinking water, cultural and spiritual values
- Port of Cape Flattery marine waters – aquatic ecosystems, visual recreation, industrial use, cultural and spiritual values.

The project will interact with smaller waterways and wetlands within MLA100308. However, buffer zones will be established between all mining areas and dune lakes to prevent any impacts on these areas. For this reason, and as all marine activities will be within port limits, the project will not interact with any HEV waters.

Note that while spatial mapping indicates waterways in the proposed mining area drain to the coast, it is understood the waterways within the mining area terminate in wetlands or drainage depressions. There is no surface hydraulic connection from the mining and processing area to coastal waters. This is due to the dune ridge that runs along the coast, separating the inland mining areas from the coastal strip. This will be confirmed during EIS studies.

Diatreme has commenced water quality monitoring for the site but this remains in a preliminary state. Water quality monitoring has been undertaken for the Cape Flattery Silica Mine in accordance with EA conditions. Data obtained from this monitoring indicates the streams and lakes have low pH, indicating acidic waters, with oxygen levels ranging between 70 and 100%, and low levels of turbidity. This is typical of coastal creeks in heath-dominated landscapes.

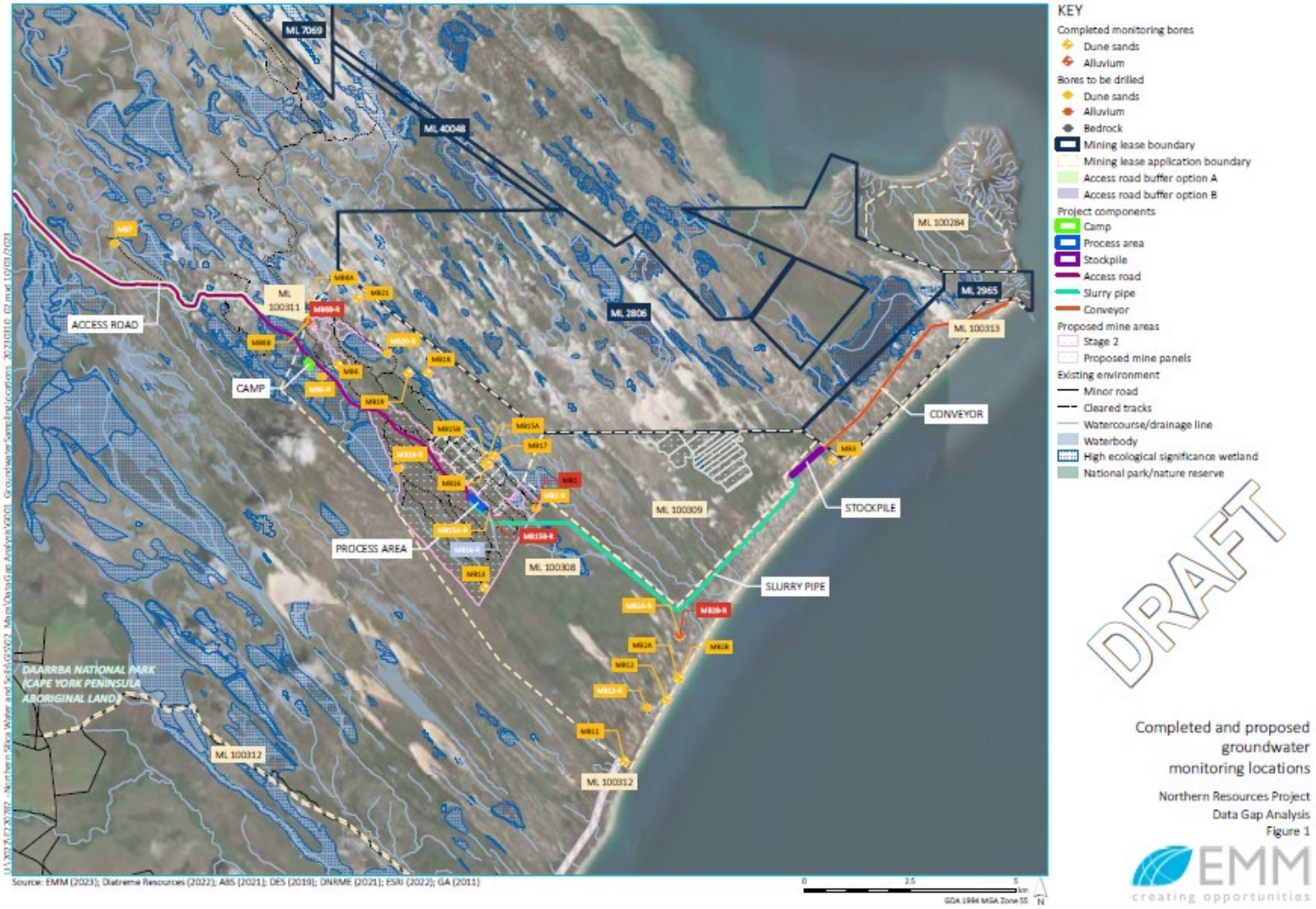

Figure 4.3 Current and proposed locations of groundwater monitoring bores

NOTE: location of project infrastructure is indicative/draft – refer to Figure 2.4 for project details

Impacts and Assessment Requirements

Mining operations are not anticipated to cause impacts to surface water quality as the mining process does not generate sediment that will contribute to downstream erosion and sedimentation, there will be vegetated buffers between mining operations and watercourses, and the mineral processing does not use chemical agents except for biodegradable flocculants. Additionally, as noted, no waterways within or near the mining area drain to the coast and therefore there is no surface pathway for any contaminants to enter the marine environment.

Material may be loaded onto OGVs either directly from a conveyor or through rehandling from barges (see Section 2.3.2). Both options pose the risk of loss of silica sand material, either through minor spillage or wind-blown sand during loading or from large-scale spills. Incidental spillage is unlikely and can be managed through the optimisation of conveyor and loading system. To prevent and respond to larger-scale spills, Diatreme will initiate a product spill response plan (or equivalent) in consultation with Ports North to minimise the possibility of impact to the marine environment. Note however that, even if spilt, as the material is sand, it is unlikely to lead to detrimental effects on the benthic environment.

No capital dredging, bed-levelling or similar activities are proposed. Propellor wake from OGVs is also unlikely to cause plume impacts due to the depth at which these vessels will operate and the lack of silts or other fines within the bed sediment.

Noting the above, the intended focus for the EIS will be:

- Characterising seasonal water quality and related characteristics of surface waters across the Project Area
- Establishing the basis of a longer-term monitoring program that can be used to establish long-term performance triggers for protecting the environmental values of water on and adjacent the site.

4.4.2 Water Resources

The Project Area is within the Cape Flattery Dune Lakes area of the Jeannie River basin, as defined in the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*. The Jeannie River Basin is 3,000km^2 and located along the southern section of the Cape York Region, along the eastern coast of Cape York Peninsula.

Within the Project Area there are two main catchments, formed by the ridge along the coastal foredunes. Seaward of this ridge there are several small coastal creeks, providing surface drainage of the foredunes as well as capturing and groundwater infiltrating through the dunes. Landward of the ridge, there are a series of larger waterways, including ephemeral and permanent features, together with wetlands and lakes. These features do not connect to each other, due to the presence of the ridgeline. Features inland of the ridgeline do also not drain to larger watercourses offsite but rather provide surface drainage from rainfall, with drainage into dune lakes or into the dune itself and underlying groundwater system. This will be confirmed as part of EIS studies.

These features are noted as ‘unmapped’ under the Queensland *Water Act 2000*, indicating that further assessments are required by RDMW to determine if the features are ‘watercourses’ or ‘drainage features’ for the purposes of the Act.

There are 16 lakes and ponds in the dune fields of Cape Flattery and this includes a total of 0.3km^2 of dune lake and 14.4km^2 of window dune lakes overall at Cape Flattery according to Directory of Important Wetlands Australia (DIWA) Wetland Info. There is one dune lake within MLA100308. This dune lake is approximately 0.85km^2 in size.

It is expected that a portion of rainfall infiltrates through the dunes, reaches the groundwater table at a shallow depth, and then may flow laterally into waterways and ponds. This process may be modelled using the latest version of TUFLOW, which includes consideration of subsurface drainage and interflow

A preliminary characterisation of the local hydrogeological regime has been conducted by EMM for the site (EMM, 2023). This characterised the regime as follows:

- A shallow, unconfined Quaternary sand dune aquifer is the primary groundwater resource in the area. The dune system is likely to function as a single groundwater system based on existing drilling results which indicate few clay units and aquitards. Direct rainfall recharge primarily during the wet season is likely to recharge the aquifer annually. The water table will likely be deep (10 to 30m depth) beneath the dune crests and very shallow (near surface) in the interdune slacks. Groundwater is expected to flow towards the coast in a general south-east direction with local variability around wetlands and creeks. Discharge from the dune sand aquifer is expected to include offshore discharge, discharge to surface water and evapotranspiration.

  It is assumed that there is significant hydraulic connection between groundwater and surface water in the Project Area. The freshwater-saltwater interface is expected to be diffuse and strongly influenced by seasonal offshore discharge.

- An unconfined to semi-confined aquifer associated with deeper alluvium is inferred beneath the dune sand sequence. This is based on previous drilling observations at the GSSP and anecdotal experience from the CFSM project. This is broadly analogous to the geology encountered at the Project Area. This aquifer is expected to be less than the dune sands due to a higher percentage of fine-grained material. The aquifer would receive recharge mainly from vertical seepage from the dunes above and would discharge offshore to the coast. The thickness of this unit and the degree of hydraulic connection between the two aquifer systems is not well understood.

- A regional fractured groundwater system associated with the underlying Mesozoic sedimentary units (i.e. Hodgkinson Formation). It is anticipated that there is very limited hydraulic connection between the bedrock and the overlying unconsolidated aquifer systems.

Initial testing of groundwater from pre-wet season indicates electrical conductivity (EC) of groundwater is fresh, ranging from 48 to 220µS/cm, and pH was slightly acidic to neutral, ranging from 6 to 7.2.

EMM's preliminary hydrogeological conceptual model for the Project Area is presented in Table 4.1.

Table 4.1 Preliminary hydrogeological conceptual model for Project Area (EMM, 2023)

Potential aquifer	Description	Groundwater levels, flow, and yield	Recharge and discharge	Groundwater-surface water interactions	Water quality
Dune sands	• Primary groundwater resource in Project Area. • The aquifer is within fine to very fine aeolian quartzose sands. • The aquifer is generally homogenous with minor clay and clayey sand horizons which may function as local layers of hydraulic resistance. • Dune thickness varies across the Project Area from ~ 20-50m thick. • Values for hydraulic conductivity (K) in clean fine sands indicate values between 1 to 5 m/day (Kruseman & De Ridder 1994) whereas values as high as 25 m/day were encountered at GSSP. This local variation could exist due to low permeability clay horizons.	• Level—groundwater levels range from near surface (interdune deposits) to 38 m below ground level (mbGL) on dune crests • Flow—Locally controlled by dune morphology from dune crests (high) to interdune area (low). Regional groundwater flow is inferred towards the coast (south-east). • Yield—Limited data in Project Area. However, production bores north-east of the Project Area have high yields (10-40 L/s).	• Recharge—Direct rainfall infiltration primarily in the wet season, with some recharge from ephemeral watercourses. • Discharge— Via baseflow to adjacent surface water features, evapotranspiration, offshore discharge, groundwater abstraction and local leakage to underlying alluvium and fractured bedrock.	• The morphological characteristics of dune complex, presence of interdune wetlands/waterbodies and high rainfall in wet season create substantial surface-ground water interactions.	• Electrical conductivity (EC) values ranged from 48-220 µS/cm and slightly acidic to neutral pH (6 to 7.2).
Alluvium	• Limited data in Project Area but inferred to exist beneath dune sands. • Characterized by well graded sand with higher fines content.	• Level—Limited data in Project Area. • Flow—Limited data in Project Area but assumed to flow towards the coast (south-east). • Yield—Limited data in Project Area.	• Recharge—Where alluvium is exposed up-catchment, seepage from overlying dunes and rainfall recharge could occur. • Discharge— Discharge to the coast.	• Limited data in Project Area.	• Limited data in Project Area.
Fractured bedrock	• Limited data in Project Area with no significant water resource (only 1 registered borehole within 10 km of Project Area). • Unconformably overlain by alluvium and dune sands, expecting to act as a patchy fracture rock aquifer with interbedded leaky aquitards.	• Limited data in Project Area.	• Recharge—Seepage from overlying dunes and alluvium and via outcrops to the west of the Project Area. • Discharge— Offshore discharge.	• Limited data in Project Area.	• Limited data in Project Area.

Impacts and Assessment Requirements

No diversion of surface water or other impacts to surface waterbodies is proposed as part of the project.

Sand mining will not occur below or intersect the natural groundwater water table.

Groundwater extraction will be undertaken to provide water for operational purposes, including water for mineral processing, drinking water, dust suppression and other operations. However, this extraction will be balanced with groundwater reinjection. Diatreme intend to develop and implement an adaptive management model for groundwater management, whereby ongoing groundwater monitoring is utilised to inform extraction and reinjection needs. As no chemicals are used in mineral processing (other than biodegradable flocculants), the resultant groundwater will be of high quality and suitable for reinjection to the natural system.

All groundwater extraction will be subject to licensing under the *Water Act 2000*. Further details on the proposed water supply process are provided in Section 2.3.4.

Noting the above, the intended focus for the EIS will be:

- Characterising seasonal groundwater quality and levels, including mapping of groundwater-dependent ecosystems
- Development of a detailed hydrogeological model for the Project Area, including rates of drawdown, elevation and movement associated with different recharge and extraction events
- Establishing the basis of a longer-term monitoring program that can be used to establish long-term performance triggers for the site.

4.5 Flooding and Regulated Structures

There is no data regarding the history of flooding for the Project Area. However, during the wet season the creeks and waterways throughout the broader region receive significant rainfall, leading to flooding of access roads. Smaller waterways in the Project Area are also expected to be subject to flooding during this time, although as they are each small catchments, the extent of this flooding is not anticipated to be significant. Flooding is not expected to affect any key project infrastructure, including mining and processing areas. Similarly, any access roads to the Project Area will be developed to provide sufficient flood immunity.

Note that under the Hope Vale Planning Scheme and associated local disaster mapping arrangements, the Project Area is not included as part of a flooding overlay.

No dams, levees or other regulated structures are proposed as part of the works.

Impacts and Assessment Requirements

Project activities will not cause a material change in drainage or runoff patterns and therefore will not cause flooding impacts offsite.

All project infrastructure will be located outside of flooding area or, where not avoidable, will be designed to provide sufficient flood immunity (e.g. road crossings of waterways).

Noting the above, the intended focus for the EIS will be:

- Characterising hydrology of the Project Area, including location and size of catchments
- Identifying flood free areas for infrastructure development

- Identification of waterways and hydrological characteristics relevant for design of access roads. This will include consideration of fish passage.

Numerical modelling of flood conditions is not anticipated to be required.

4.6 Flora and Fauna

As part of a large coastal dune system, the Project Area supports a range of coastal vegetation and ecological communities. The key vegetation communities consist of:

- *Neofabricia myrtifolia* and *Neoroepera banksii* open to closed heath, comprising the largest portion of the Project Area
- *Araucaria cunninghamii* low closed forest to open forest / littoral rainforest, comprising the second largest portion of the Project Area and including areas that may constitute the Littoral Rainforest Threatened Ecological Community (TEC), listed under the EPBC Act.
- Other heath communities, including *Thryptomene oligandra* open heath, dwarf open heath and swamp heath
- Coastal/foredune tussock grassland, forblands and shrublands
- Sedgelands associated with perennial dunefield lakes
- *Melaleuca arcana* low open forest

A map of these communities is provided in Figure 4.4 while Figure 4.5 shows mapping of the status of these communities under the Vegetation Management Act. Note that all these communities are regulated vegetation while 'Of Concern' communities are also Matters of State Environmental Significance (MSES). The Regional Ecosystem (RE) descriptions associated with these communities are listed in Table 4.2.

These habitats support a range of flora and fauna species commonly associated with littoral and dune environments. Key fauna species known or likely to occur include a range of bats, shorebirds and waders, and coastal mammals and reptiles while the surface waterways and wetlands support saltwater crocodiles. Key flora species include a range of orchids and other species common in heathlands.

Lacustrine and palustrine waterbodies mapped by the Queensland government (Wetlandinfo - see below) are classified as high ecological significance (HES) wetlands. HES wetlands are mapped across the north-western transport route, throughout the main mining are (MLA100308) and to the north-east. The locations of these HES wetlands are mapped in Figure 4.6.

There are no reefs or shoals mapped adjacent to the Project Area in the immediate port limits or in the broader marine study area that could be affected by the project. The closest reef or shoal mapped is the coastal islands which are also ~10km away to the south-east of the wharf as seen in Figure 4.6. The rocky shores on and around Cape Flattery headland may support some sparse macroalgae or coral species but this is yet to be confirmed and will be further investigated as part of assessment studies. Through previous surveys, including benthic habitat assessments undertaken by BMT in 2021, the remainder of the marine environment in and around the Cape Flattery Wharf and immediate port limits is known to consist of bare sandy substrate and does not support any significant habitat features. Seagrass communities may occur within the embayment south of Cape Flattery but are not expected to be extensive due to the exposed nature of the bay.

Table 4.2 Regional ecosystem in the Project Area

RE No.	Status	Description
3.2.12b	No concern at present	*Araucaria cunninghamii* var. *cunninghamii* low closed forest to open forest +/- *Neofabricia myrtifolia, +/- Asteromyrtus angustifolia, +/- Sersalisia sericea +/- Thryptomene oligandra +/- Acacia* spp. *Leucopogon ruscifolius* and *Psydrax* spp. can also occasionally be co-dominant. *Araucaria cunninghamii* var. *cunninghamii* often forms a noticeable emergent layer. A wide range of heath and rainforest species can also occur in the very sparse to mid-dense subcanopy and/or shrub layers along with canopy species. These can include *Eugenia reinwardtiana, Drypetes deplanchei, L. yorkensis, Xanthostemon youngii, Terminalia muelleri* and *Rhodamnia* spp. A range of vines and epiphytes can also occur. The ground cover is very sparse and commonly includes *Arthrostylis aphylla, Dianella* spp., *Lomandra* spp. and seedlings of woody species. Occurs on coastal dunefields and beach ridges.
3.2.14	Of Concern	*Melaleuca arcana* low open forest associated with dune swamps.
3.2.18	No concern at present	*Thryptomene oligandra* open heath +/- *Asteromyrtus lysicephala* on flat sand plains.
3.2.21a	No consent at present	Sub-class 'a': *Neofabricia myrtifolia*, *Neoroepera banksii* open to closed heath, usually with *Jacksonia thesioides* and *Leucopogon ruscifolius*. Other commonly occurring species are Boronia *alulata*, *Hibbertia banksii*, *Acacia calyculata*, *Asteromyrtus lysicephala*, *L. lavarackii* and *Labichea buettneriana*. An emergent layer often contains *Grevillea pteridifolia*, *Allocasuarina littoralis* and *Acacia* spp. The very sparse ground layer most commonly contains *Lomandra banksii*, *Schoenus sparteus* and *Arthrostylis aphylla*. Extensive on dunefields.
3.2.21b	No concern at present	*N. myrtifolia, Labichea buettneriana* dwarf open-heath, usually with *J. thesioides, L. ruscifolius, B. alulata* and *Neoroepera banksii* as sub dominants. *H. banksii and G. pteridifolia* also usually occur. *A. littoralis, Banksia dentata* are common very scattered emergents. *S. sparteus* is usually dominant in the sparse ground layer. Extensive on dunefields.
3.2.22	Of Concern	Mixed dwarf open heath on dunes and headlands.
3.2.24	Of Concern	Mixed open tussock grassland and open forblands or shrublands on exposed foredunes and islands.
3.2.26	No concern at present	'Sparse herbland and/or shrubland and bare sand areas predominantly on sand blows.
3.2.27	No concern at present	Sedgelands fringing perennial lakes in coastal dunefields.
3.2.33	Of Concern	*Gahnia sieberiana* open to closed heath in drainage swamps in east coast dunefields.

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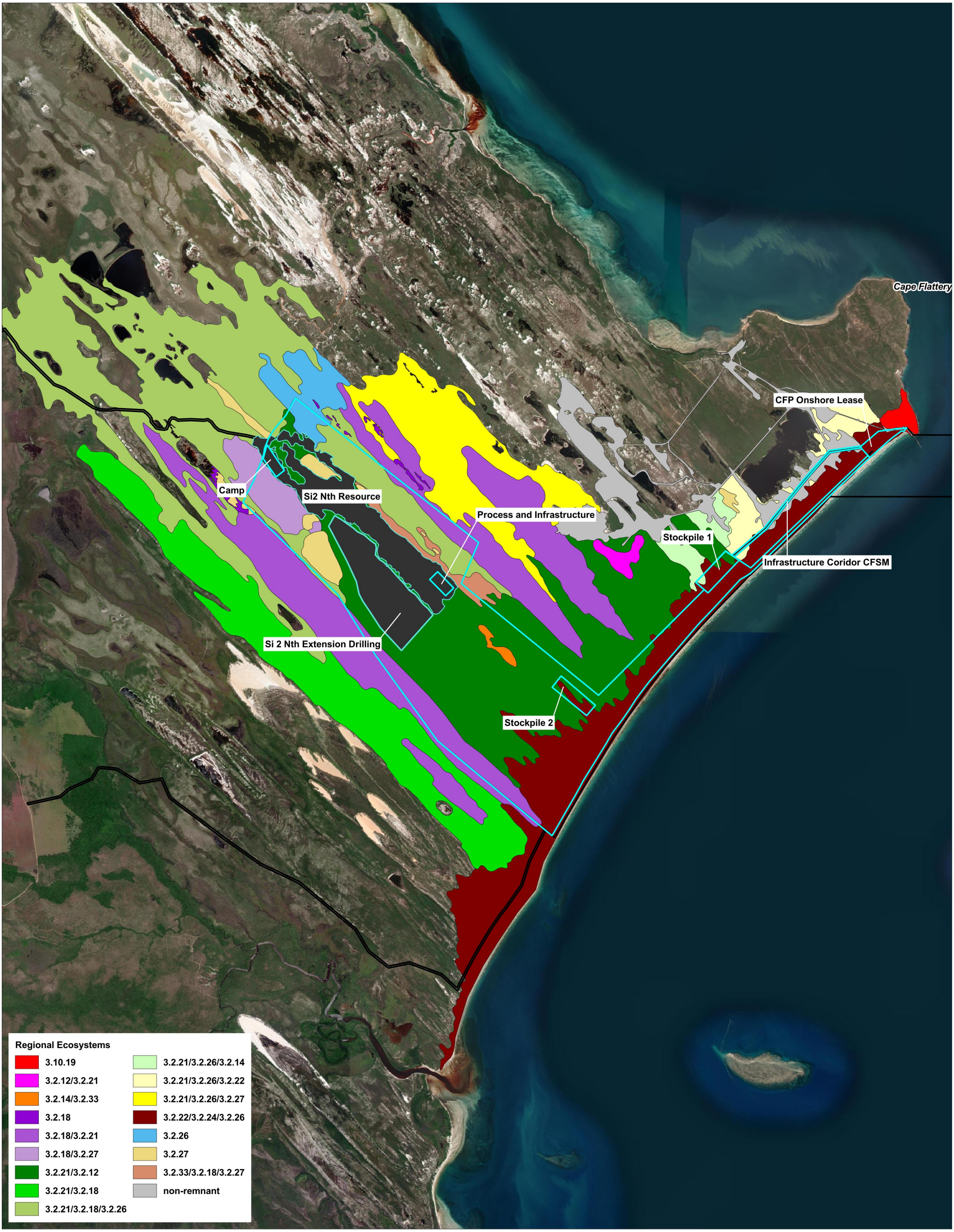

LEGEND

Project Elements

- Camp, CFP Onshore Lease, Infrastructure Coridor CFSM, Process and Infrastructure, Revised NRP MLA, Stockpile 1 Stockpile 2
- Si2 Nth Extension Drilling
- Si2 Nth Resource
- Scope of EPBC Referral

Title:

Vegetation communities of the Project Area

Figure: 4.4

Rev: A

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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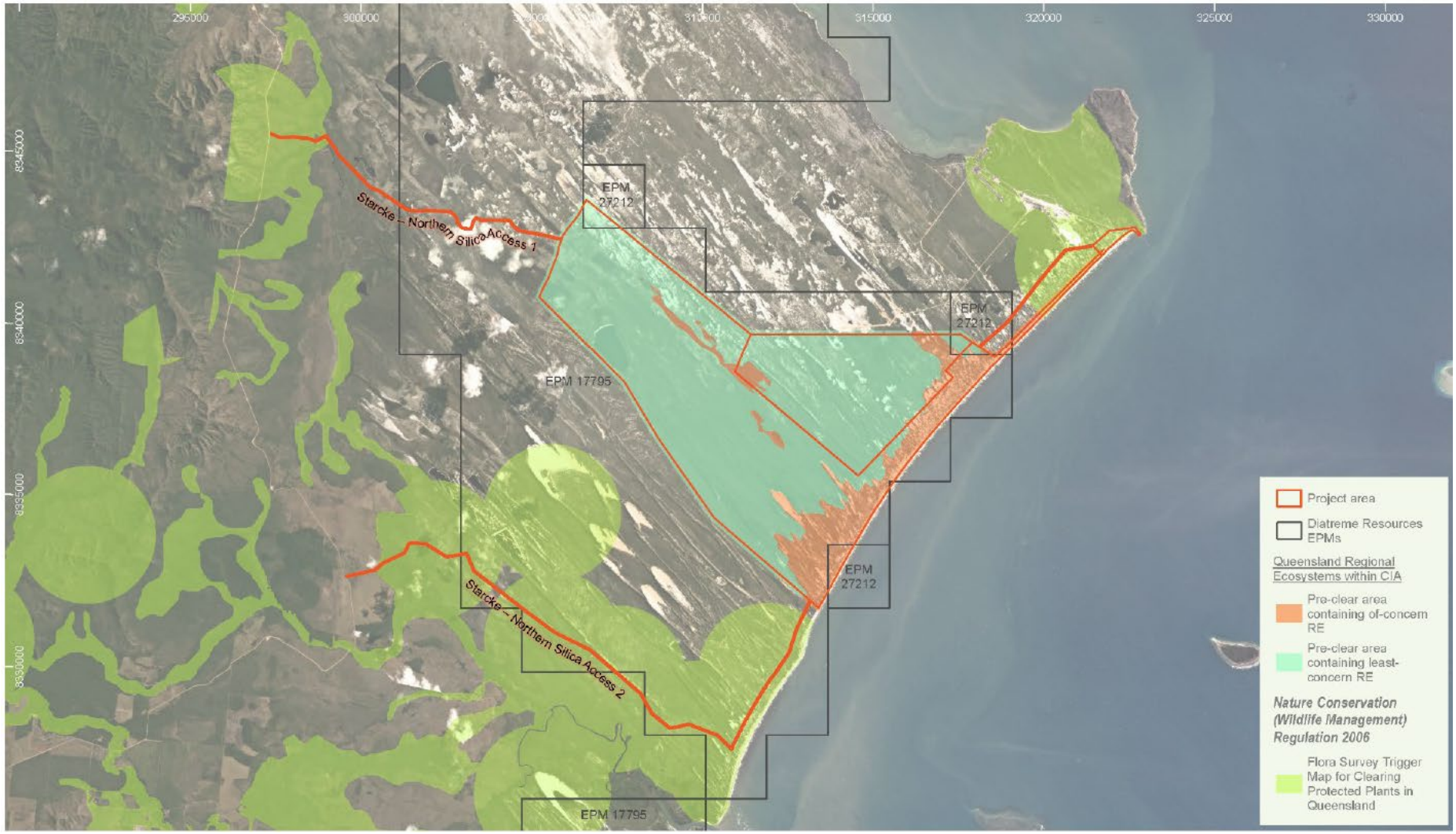

Figure 4.5 Listing status of vegetation communities in the Project area under the Vegetation Management Act

LEGEND

Project Elements

- Camp, CFP Onshore Lease, Infrastructure Coridor CFSM, Process and Infrastructure, Revised NRP MLA, Stockpile 1 & 2
- Si2 Nth Extension Drilling
- Si2 Nth Resource
- Port Limits
- Marine Park - Highly Protected Zones

MSES

- Reefs and Shoals
- Seagrass
- High Ecological Significance Wetlands
- Regulated Vegetation 100m from Wetland
- Selected Mining Leases

Title:

MSES Wetlands and Coastal Habitats around the Project Area

Figure: 4.6

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Table 4.3 presents an assessment of the likelihood of occurrence of species listed as threatened under the NC Act. This list is based on the complete list of species identified in Wildlife Online and Protected Matters Search Tool (PMST) reports for the Project Area and surrounds but screened to species relevant only under the NC Act. As part of the likelihood of occurrence, all species are categorised as follows:

- *Known to occur*—the species is known to occur within the Project Area and there are recent records of it present
- *Likely to occur*—there is a high probability the species occurs within, or regularly visits, the Project Area because suitable habitat occurs, the Project Area is within the known distribution of the species and there are past records of the species in the vicinity
- *Possible to occur*—either: (i) suitable habitat occurs for the species but there are no records in the vicinity and/or insufficient species distribution data to categorise the species as likely or unlikely to occur; or (ii) there are species records in the vicinity but habitat within the Project Area is suboptimal due to poor condition and/or limited extent and species presence is likely to be temporary
- *Unlikely to occur*—there is a very low probability that the species occurs in the Project Area because suitable habitat does not occur; the Project Area is outside the known distribution of the species; there are no records of the species in the locality and/or the species is considered locally extinct.

Screening for these species accounted for recent records, publicly available from the WildNet database (through the Queensland Government *Wildlife Online* platform: https://apps.des.qld.gov.au/report-request/species-list/) and the Atlas of Living Australia (https://www.ala.org.au/), as well as published profiles for species from the Commonwealth Government Species Profile and Threats (SPRAT) database, including associated listing and conservation advice.

Of the 63 species assessed, 30 are considered possible, likely or known to occur in the Project Area. These consist of:

- Two critically endangered species (two shorebirds)
- 11 endangered species (three shorebirds, one wetland bird, two bats, one plant, four marine turtles)
- 15 vulnerable species (two shorebirds, one butterfly, three marine mammals, four plants, two turtles, one crocodile, one other reptile)
- Two near threatened species (two plants).

The shoreline of the Project Area is also likely to support foraging activities by a range of migratory shorebirds that would be special least concern species under the NC Act. However, the area is not known to support any large aggregations due to the lack of wetland complexes and extensive saltmarsh and intertidal habitat.

Table 4.3 Likelihood of occurrence for NC Act listed species

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
Amphibians				
Litoria dayi	Lace-eyed treefrog	V	***Unlikely***	*Preferred habitat (rainforest streams) is not present in Project Area; species not known to occur in broader region.* The Australian lacelid is endemic to the Wet Tropics Bioregion, from Paluma to Cooktown, at altitude from sea level to 1,200m above sea level (TSSC, 2019c). Habitat within the Project Area is unsuitable for the species and it is not known or likely to occur in or near the Project region.
Birds				
Ardenna pacifica	Wedge-tailed shearwater	V	***Unlikely***	*Preferred habitat (offshore islands) is not present in Project Area.* The wedge-tailed shearwater is a pelagic (open sea) bird that ranges throughout the tropical Pacific and Indian Oceans between (approximately) latitudes 35°N and 35°S (BirdLife 2022a, DCCEEW 2022a). The species nests in colonies, in burrows, on offshore islands or atolls. They forage and breed offshore but are infrequent and transient visitors to mainland Australia. The wedge-tailed shearwater has been recorded on islands offshore from Cape Flattery (WildNet). The habitat within the Project area is sub-optimal and no suitable habitat for the species is present.
Calidris canutus	Red knot	E	***Possible***	*Known from islands offshore of Cape Flattery and could utilise near coastal wetlands in Project Area.* The red knot (six subspecies) has an enormous global distribution (~1,600,000km^2). Two subspecies regularly occur in Australia, *C. c. piersmai* and *C. c. rogersi*. Another (*C. c canutus*). Occurs as an occasional vagrant (Garnett & Baker, 2020). Red knots that visit Australia breed in the northern hemisphere and migrate along the east Asian-Australasian Flyway (EAAF) to spend the boreal winter in Australasia. They are common in all suitable habitats around the Australian coast, including intertidal mudflats, sandflats and sandy beaches on sheltered coasts, and occasionally sandy ocean beaches or shallow pools on exposed rock platforms. Red knots are sometimes seen at near-coastal, saline wetlands, on sewage ponds, and at saltworks (TSSC, 2016e). the species has been recorded on islands offshore from Cape Flattery (WildNet) and may occasionally occur at near-coastal wetlands and elsewhere within the Project Area. These habitats are not critical to individual or species survival.
Calidris ferruginea	Curlew sandpiper	CE	***Possible***	*Known from islands offshore of Cape Flattery and could utilise near coastal wetlands in Project Area.* Curlew sandpipers visit but do not breed in Australia. In Australia, the species occurs around coasts, and as a transient and unpredictable visitor across much of the interior. There are records of the species from all Australian states, not only during the non-breeding period but also during the breeding season, as many non-breeding birds remain in Australia rather than migrating north. In Australia, curlew sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, and around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. Curlew sandpipers are occasionally but infrequently observed around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. The occur in both fresh and brackish waters, and occasionally around floodwaters (TSSC, 2015a). Curlew sandpipers have been recorded on islands offshore from Cape Flattery (WildNet) and the species may occasionally occur at near-coastal wetlands within the Project Area. These habitats are not critical to individual or species survival.
Calidris tenuirostris	Great knot	CE	***Possible***	*Known from islands offshore of Cape Flattery and could utilise near coastal wetlands in Project Area.*

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				The great knot breeds in northeast Siberia and far northeast Russia. It undertakes biannual migrations along the EAAF and most of the population (~90%) winters in Australia, primarily at sites on the northern coast (TSSC, 2016f; Garnett & Baker, 2020). In Australia, great knots prefer sheltered, coastal habitats with large, intertidal mudflats or sandflats, such as inlets, bays, harbours, estuaries and lagoons. They are occasionally observed on exposed reefs or rock platforms, mangroves on shorelines, saltwork ponds, swamps near the coast, salt lakes, non-tidal lagoons, and rarely on inland lakes and swamps (TSSC, 2016f). The great knot has been recorded on islands offshore from Cape Flattery (WildNet) and may occasionally occur at near-coastal wetlands within the Project Area. These habitats are not critical to individual or species survival.
Charadrius leschenaultii	Greater sand plover	V	***Possible***	*Known from islands offshore of Cape Flattery and could utilise near-coastal dunes in Project Area.* The greater sand plover breeds in the northern hemisphere and migrates biannually to and from southern feeding grounds for the southern summer. The species distribution in Australia is widespread, although most observations are in northern Australia (TSSC, 2016g). In Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. Greater sand plovers mainly occur on sheltered sandy/shelly/muddy beach, large intertidal mudflats, sandbanks, saltmarsh, estuaries, coral reefs, rocky island rock platforms, tidal lagoons and dunes near the coast. They usually feed from the surface of wet sand or mud on open intertidal flats of sheltered bays, lagoons or estuaries (TSSC, 2016g). The greater sand plover has been recorded on islands offshore from Cape Flattery (WildNet). The species may occur within the Project Area, in near-coastal dunes.
Charadrius mongolus	Lesser sand plover	E	***Possible***	*Known from islands offshore of Cape Flattery and could utilise near-coastal dunes in Project Area.* The lesser sand plover breeds in the northern hemisphere and migrates to and from southern feeding grounds for the austral summer (TSSC, 2016b). The lesser sand plover has an extremely large range (~3,620,000km^2). It has been recorded in all Australian states during the non-breeding season. Lesser sand plovers are almost strictly coastal, preferring sandy beaches, mudflats of bays and estuaries, sandflats, near-coastal dunes, and occasionally mangrove mudflats (Bio, 202b). the lesser sand plover has been recorded on islands offshore from Cape Flattery (WildNet) and may occur within the Project Area, in near-coastal dunes. These habitats are not critical to individual or species survival.
Cyclopsitta diophthalma macleayana	Macleay's fig-parrot	V	***Unlikely***	*Preferred habitat (rainforest and eucalypt woodland) is not present in Project Area; species not known to occur in broader region.* Macleay's fig-parrot, a subspecies of the double-eyed fig-parrot, has been recorded from around Cooktown to Eungella National Park (NP), near Mackay (Pizzey & Knight 2012). Almost all records of the subspecies are from the Wet Tropics Bioregion, with a single outlier north of the Wet Tropics, in Starcke NP, which is ~15.5 km north-west of the Project area, and has landscapes, soils, and vegetation associations (NPRSR 2013) unlike those that occur in the Project area. Double-eyed fig-parrots inhabit rainforest, and adjacent eucalypt woodlands, coastal scrubs, timber along watercourses and paperbark woodlands. They excavate their nests in decayed trunks and branches of tall (10 m+) trees and dead tree stags (Pizzey and Knight 2012). The species has not been recorded near the Project area and is not likely to occur. The habitats within the Project area and surrounds are not suitable for the species.
Erythrotriorchis radiatus	Red goshawk	E	***Unlikely***	*Preferred habitat (tall open forests and woodlands) is not present in Project Area; no known records within 40km of Project Area.* The red goshawk occurs in a patchy, widespread distribution across coastal and sub-coastal regions of northern and eastern Australia. The species inhabits tall, open forests and woodlands, tropical savannas traversed by wooded or forested rivers, and the edges of rainforests, usually on fertile soils. Red goshawks prefer areas with permanent water and large population

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				of the birds on which they predate (Marchant & Higgins, 1993l TSSC, 2015b). The red goshawk has not been observed within 40km of the Project Area and the habitats in the Project Area are unsuitable.
Esacus magnirostris	Beach stone-curlew	V	***Known***	*Recent records in Project Area.* Beach stone curlews occur along the coasts of northern and eastern Australia. They occur on open, undisturbed beaches, exposed reefs, tidal sand and mudflats, mangroves, coastal lagoons, and occasionally in sugarcane fields (Pizzey and Knight 2012). The beach stone curlew has been recorded in the Project area (WildNet) and suitable habitat occurs along the beach.
Falco hypoleucos	Grey falcon	V	***Unlikely***	*No known records within 70km of Project Area; closest record is south of the Project Area, with no known records north of this, indicating Project Area is likely outside of species current distribution.* The grey falcon is an elusive and rarely seen species. The adult population is estimated to number fewer than 1,000 mature individuals (TSSC, 2020) which occur at extremely low densities across vast expanses of inland Australia. Grey falcons primarily occur in arid and semi-arid regions that receive less than 500mm annual rainfall, and nesting has only been observed in areas of the hottest climate classes (Schoenjahn, 2013; Schoenjahn *et al.* 2020). During times of drought that follow wet years, grey falcons disperse towards coastal areas, becoming more widespread (Schoenjahn *et al*. 2020; TSSC, 2020). The species prefers habitats including shrubland, grassland, and wooded watercourses. It also frequents timbered lowland plains, particularly *Acacia* shrublands that are crossed by tree-lined watercourses (Schoenjahn, 2013; Schoenjahn *et al.* 2020; TSSC, 2020). There are records of the species scattered across much of the continent, including eastern Australia. The nearest observation is 70km south of the Project Area. There are no records of the species further north on Cape York (WildNet).
Hirundapus caudacutus	White-throated needletail	V	***Unlikely***	*Known from records <15km from Project Area; however, any occurrence would be limited to overflight of the Project Area (species is almost entirely aerial, foraging and sleeping on the wing).* The white-throated needletail is almost entirely aerial, foraging and sleeping on the wing, from heights of less than 1m to more than 1,000m above the ground. White-throated needletails do not breed in Australia. The species occurs above a broad range of habitat types but is recorded most often above wooded areas, including rainforest and open forest (TSSC, 2019a). They sometimes roost in tree hollows in tall trees on ridge-tops, and on bark or rock faces, and appear to return to traditional roost sites (DoE, 2015b). White-throated needletails may occur anywhere in eastern Australia. The white-throated needletail has been recorded near Point Lookout, ~15km north of the Project Area (WildNet). The species is likely to overfly the Project Area but is not likely to land. ***Note: Based on EPBC Referral decision for the project, despite being initially assessed as possibly present, this species is no longer considered relevant to the project.***
Limosa lapponica baueri	Western Alaskan bar-tailed godwit	V	***Unlikely***	*Known from islands offshore of Cape Flattery and could utilise beach and near-coastal estuaries and wetlands in Project Area.* The Western Alaskan bar-tailed godwit is widespread along the east and northeast coast of Queensland and Torres Strait during its non-breeding season. In Australia, the species occurs primarily in coastal habitats including large, intertidal sandflats, mudflats, estuaries, inlets, brackish wetlands, sandy ocean beaches, rock platforms, and coral reef-flats. The Western Alaskan bar-tailed godwit usually forages in tidal estuaries and harbours near the edge of water or in shallow water (TSSC, 2016). The species has been recorded on islands offshore from Cape Flattery (WildNet) and may occur within the

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				Project Area, along the beach and in near-coastal estuaries and wetlands. These habitats are not critical to individual or species survival. ***Note: Based on EPBC Referral decision for the project, despite being initially assessed as possibly present, this species is no longer considered relevant to the project.***
Numenius madagascariensis	Eastern curlew	E	***Possible***	*Known from islands offshore of Cape Flattery and could utilise beach and near-coastal estuaries and wetlands in Project Area.* The eastern curlew migrates to but does not breed in Australia. Within Australia, the species has a primarily coastal distribution, where it mainly forages on soft, sheltered, intertidal sandflats or mudflats, that are open, and without vegetation or covered with seagrass. These foraging areas are often near mangroves, on saltflats, or in saltmarsh, rockpools, among rubble on coral reefs, and on ocean beaches near the tideline. Eastern curlews are sometimes but infrequently seen on near-coastal lakes or in grassy areas (TSSC, 2015e). The species has been recorded on islands offshore from Cape Flattery (WildNet) and may occur within the Project Area, along the beach and in near-coastal estuaries and wetlands. These habitats are not critical to individual or species survival.
Probosciger aterrimus macgillivrayi	Southern palm cockatoo	E	***Unlikely***	*The Project Area is expected to be outside of the species distribution.* Australian palm cockatoos are considered to be a distinct subspecies that is distributed across the north of Cape York Peninsula, from the tip of the peninsula, south to Edward River, west to Archer River and east to Princess Charlotte Bay. The subspecies occurs in lowland tropical rainforest and woodland, often within ecotones between rainforest, including dense, riparian rainforest, open savannah woodland dominated by eucalyptus, corymbia and/or melaleuca species, and swamp woodlands that contain Pandanus species (QGov, 2022). Connectivity between palm cockatoo populations on Cape York is poorly understood (Marchant & Higgins, 1993; TSSC, 2015d; QGov, 2022). The palm cockatoo is not likely to occur in or near the Project Area. No records exist within and/or anywhere near the Project Area and it is unlikely that the species occurs as far south.
Rostratula australis	Australian painted snipe	E	***Possible***	*Preferred habitat for the species (wetlands) occurs in the Project Area, although closest records for the species are >150km south of the Project Area.* Australian painted snipes have been recorded in wetlands across all states of Australia. They inhabit shallow, freshwater wetlands, including temporary and permanent lakes, swamps, and claypans. Australian painted snipes also use inundated or waterlogged grassland, saltmarsh, dams, rice crops, sewage farms, and bore drains (TSSC, 2013; Marchant & Higgins, 1993). The nearest record (WildNet) is approximately 150km south of the Project Area; however, the entire population may be as few as 340 mature individuals, following recent population declines, and the species is rarely seen. Australian painted snipes have been observed in waterbodies/wetlands in a broad range of habitat types, including non-remnant vegetation, and suitable habitat exists in the Project Area, so it is possible that it is a sporadic and transient visitor.
Turnix olivii	Buff-breasted button-quail	CE	***Unlikely***	*The species is likely extinct.* It has been 98 years since the last verifiable evidence of the buff-breasted button-quail was recorded, the longest such duration for any Australian bird that is nonetheless presumed extant (Webster et al 2022). Based on available knowledge, much of it anecdotal, habitat critical to the survival of the species is likely to be stoney and/or grassy woodlands and forests, on plains and slopes. *Melaleuca viridiflora* and *M. minutifolia* often dominate the mid storey. The well-drained, slightly sloping bases of hills that support this vegetation have been proposed as critical during the breeding season (L. Nielsen pers. comm. cited in Mathieson and Smith 2009). There is habitat in the local region that could potentially support buff-breasted button-

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				quail; however, the species has not been detected in 98 years, despite extensive searches (Webster et al 2022), and is likely extinct.
Tyto novaehollandiae kimberli	Masked owl (northern)	V	***Unlikely***	*Preferred habitat (riparian forest, rainforest, melaleuca swamps) is either not present in Project Area or suboptimal and unlikely to support species.* The distribution of the masked owl (northern) is poorly known. Three sub-populations have been proposed: 1) Kimberley, 2) Northern Territory, and 3) Cape York. The subspecies occurs along the southern rim of the Gulf of Carpentaria, Cape York Peninsula, and south to the Atherton Tablelands and the Einasleigh-Burdekin divide (TSSC, 2015). There are historical (Queensland) records of the masked owl (northern) from the Normanton region, and from Pascoe, Archer, Chester, and Watson Rivers on Cape York Peninsula. Masked Owl (northern) has been observed in riparian forest, rainforest, and open forest, melaleuca swamps, the edges of mangroves, and along the margins of sugar cane fields (TSSC, 2015). There are no records of the subspecies near the Project Area and the habitat is suboptimal.
Fish				
Stiphodon semoni	Opal cling goby	CE	***Unlikely***	*Preferred habitat (rainforest streams) is not present in the Project area; species not known from broader region.* The opal cling goby is known from Bali, Indonesia, northern Papua New Guinea, the Solomon Islands, and a small area in Australia, where the species is known only from 10–30 individuals recorded in a limited number of rainforest streams in the Wet Tropics Bioregion. The opal cling goby was first observed in Harvey Creek, a tributary of the Russell River, 25 km south of Cairns. The area of occupancy for the species is estimated to be only ~10 km2 (DSEWPaC 2011, TSSC 2011, Ebner & Kemp 2019). Not known or likely to occur in or near the Project area and suitable habitat does not occur.
Invertebrates				
Hydrochrysops apollo apollo	Apollo jewel butterfly (Wet Tropics subspecies)	V	***Possible***	*Suitable habitat present in Project Area, although closes record is >45km away* Occurs in coastal paperbark swamps, in close association with ant plants, *Myrmecodia becarii* (Samson 2009, Laidlaw & Butler 2012a). The Wet Tropics subspecies reportedly occurs from Cooktown to Ingham; a different subspecies is found from Rocky River (central Cape York) to Papua New Guinea (Dunn et al 1994, Braby 2000, Qld Museum 2000, Samson 2009, Curtis et al 2012, Geyle et al 2021). However, Laidlaw and Butler's (2012a) potential habitat model for the subspecies extends north of Diatreme's Project area (the Project area is not modelled habitat) and ant plants occur within the clearing impact area. No records within and/or surrounding (within 1 km) the Project area but suitable habitat present. The local region includes areas modelled as potential habitat and ant plants are known to occur in and near the Project area. The nearest record of the species is 47 km south-west of the Project area (ALA).
Mammals				
Dugong dugon	Dugong	V	***Likely***	*Project Area is within species distribution and habitat* Several regional sightings have occurred including the closest sighting of 14 km (Atlas of Living Australia 1974) and recent sightings 43 km away (Richardson et al 2016). These species typically inhabit areas with highly productive seagrass meadows, where feeding trails were sighted in recent surveys ~35 km south at Nob Point.
Hipposideros semoni	Semon's leaf-nosed bat	E	***Unlikely***	*Preferred habitat (tropical rainforest, sclerophyll forest and savannah woodland) is either not present in Project Area or is suboptimal and unlikely to support species; and nearest records are >40km south.*

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				Semon's leaf-nosed bat is a rare and poorly known species. It is usually found in tropical rainforest, monsoon forest, wet sclerophyll forest and open savannah woodland and sometimes along streams and rivers adjacent to rainforest. The species generally uses a range of roosts including caves, mines, houses, and trees (TSSC, 2016a) but has also been recorded in the door handle of a car, a wardrobe, a picture rail, and an oven in an uninhabited home (Hall, 2008). There are records of the species north and south of the Project Area, the nearest being in Cooktown, approximately 42km south. The habitats within the Project Area are sub-optimal for the species.
Macroderma gigas	Ghost bat	E	***Possible***	*Preferred breeding habitat (caves) is not present in Project Area and other habitats are of marginal value for foraging; and nearest records are >40km southwest.* In 2012, the total Queensland ghost bat population was estimated to possibly be ~1,200, with perhaps fewer than 400 on Cape York Peninsula. The species' current range is discontinuous, with geographically disjunct colonies occurring in the Pilbara, northern Northern Territory (including Groote Eylandt), Gulf of Carpentaria, coastal and near-coastal eastern Queensland from Cape York to near Rockhampton, and western Queensland (including Riversleigh and Cammooweal districts). Most Queensland records are from around Iron Range, Thumotang, Oyala, Kulla, and Cape Melville National Parks, and near Cooktown (Reardon *et al*. 2010). Anecdotal evidence suggests that a small, isolated subpopulation may exist south of Gladstone, at Kroombit Tops (TSSC, 2016b). Ghost bats roost in caves, rock crevices, and old mines during daylight hours. Other than Mitchell-Palmer limestone and King's Plains station, there are no definitively identified maternity sites; only fourteen (14) breeding sites are currently known (TSSC, 2016b). Clusters of records of the species near Coen and Black Mountain indicate that potential breeding sites occur in those locations; it is rumoured that there is a small colony near Iron Range (Bruce Thomson pers.com., cited in Reardon *et al*. 2010). The nearest records of the species are 47km southwest of the Project Area. The habitat in the Project Area is unsuitable for breeding (no suitable caves) and represents marginal to poor foraging habitat. ***NOTE: While originally assessed as unlikely to occur, this species has been included in the list of species for consideration under the project EPBC Referral decision and is therefore included in scope.***
Orcaella heinsohni	Australian snubfin dolphin	V	***Possible***	*Study area is within species distribution and habitat.* Several regional and local (Cooktown) sightings including the closest sighting ~130 km away (Wildnet DES 2008). The snubfin dolphin typically inhabits shallow coastal waters (<20 m deep) and coastal waters in proximity to estuaries and seagrass beds. Therefore this species may occur in coastal areas adjacent to Project area.
Phascolarctos cinereus	Koala	E	***Unlikely***	*The Project Area is expected to be outside the species distribution and preferred habitat (eucalypt forests and woodlands) is not present in Project Area or is suboptimal and unlikely to support species.* The koala is an arboreal, folivorous marsupial that is widely distributed throughout eastern Australia. Its range is closely linked to climatic conditions and the distribution of the genera eucalyptus and corymbia (Adams-Hosking *et al.* 2016; DAWE, 2022). Koala habitat includes coastal and inland areas, typically dominated by eucalyptus forests and woodlands (DAWE 2022). The listed population has a patchy but broad distribution, spanning coastal and inland areas of Queensland, north to the Herberton area (~250km south of the Project Area), and westwards into semi-arid climates of central Queensland, New South Wales and the Australian Capital Territory (DAWE, 2022). Koalas previously occurred further north, and there is a historical record (1952) approximately 55km southwest of the Project Area (Atlas of Living Australia); however, the species is considered unlikely to persist in the region. The habitats within the Project Area are sub-optimal for the species.

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
Pteropus conspicillatus	Spectacled flying-fox	E	***Unlikely***	*Preferred habitat (rainforest) is suboptimal in the Project Area and unlikely to support species; and nearest records are <40km south.* Spectacled flying-foxes occur in Indonesia, New Guinea and north Queensland, Australia (Helgen *et al*. 2008, TSSC, 2019c). In Australia, the species is restricted to north-eastern Queensland, where it occurs in association with extensive areas of rainforest, from Cape York, down the east coast to Ingham, with outlier records at least as far south as Charters Towers and as far west as Chillagoe. Within this range, the Wet Tropics region is considered to be the species' stronghold, with a smaller population around Iron Range, on Cape York. The spectacled flying-fox is generally associated with rainforests, with most colonial camps occurring in, or within several kilometres of, rainforests (Richards *et al*. 2008; TSSC. 2019c). The habitats within the Project Area are sub-optimal for the species. The nearest record is from Cooktown, approximately 42 km south of the Project Area.
Saccolaimus saccolaimus nudicluniatus	Bare-rumped sheathtail bat	E	***Possible***	*Preferred habitat (forests containing roost trees) in the Project Area is suboptimal and unlikely to support the species; and nearest records are >40km south.* The bare-rumped sheath-tailed bat is known from comparatively few records, from widespread localities, between (near) Cardwell in the south to Iron Range in the north. Its distribution on Cape York Peninsula is poorly known (Reardon *et al*. 2010). Most observations of the bare-rumped sheath-tailed bat have been in near-coastal locations (TSSC, 2016d; Biosphere, unpublished data, 2021 and 2022), although there is one record from 150km inland, in Jasper Gorge, Northern Territory. Overseas, the species has been recorded roosting in a range of environments, including numerous hollow-bearing tree species, and geological formations including caves. However, surveys of caves in Queensland and the Northern Territory have failed to locate this subspecies (Schulz & Thomson, 2007), and the small number of Australian roosts that have been identified have all been within deep hollows in eucalyptus and melaleuca trees (TSSC, 2016d). The bare-rumped sheath-tailed bat has been recorded in habitats containing suitable roost trees, or in nearby areas, north and south of the Project Area. The nearest record is from Cooktown, ~42 m south of the Project Area. The habitats within the Project Area are sub-optimal for the species. ***NOTE: While originally assessed as unlikely to occur, this species has been included in the list of species for consideration under the project EPBC Referral decision and is therefore included in scope.***
Sousa sahulensis	Australian humpback dolphin	V	***Possible***	*Closest sighting ~19 km of Project area with numerous sightings regionally.* The Australian humpback dolphin is typically found in shallow coastal waters near estuaries. Therefore this species could occur within the Project area.
Xeromys myoides	False water-rat	V	***Unlikely***	*Preferred habitat (mangrove forests) does not occur in Project Area; and nearest records are >200km south.* Water mice occur in mangrove and near-coastal freshwater ecosystems in Queensland, the Northern Territory, and Papua New Guinea (DERM, 2010). The species has been recorded at a number of locations in north-eastern and northern Australia: 1) southeast Queensland; 2) between Wide Bay and Shoalwater Bay in central Queensland; 3) vicinity of Mackay in Central Queensland; 4) Cairns; and 5) the Northern Territory (CoA, 2015; Biosphere, 2020). The species likely also occurs in other, unsurveyed mangrove habitats, where suitable habitat exists, along the Queensland and Northern Territory coasts, and in northern New South Wales, (CoA, 2015). Water mice forage in mangrove flats and generally nest in the forest zone within a few metres of the astronomical high tide mark (Russell & Hale, 2009). Suitable mangrove habitat does not occur within the Project Area and the nearest records for the species are more than 200km south, in Cairns (Ball & Mitchell, 2018; Biosphere, 2020; WildNet).

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
Plants				
Acacia solenota		V	***Known***	*Recently recorded in Project Area* Shrub or small tree confined to quaternary sand-dunes between Cooktown and Cape Flattery, sometimes in dense pure stands, in scrubs (Maslin 2018). Collection record from within ML100308. Observed as common along access roads in the Project area, December 2022.
Acmenosperma pringlei (Syzgium pringlei)		V	***Unlikely***	*Preferred habitat (gallery rainforest) is not present in Project Area.* Small tree, generally on gallery rainforest along creek lines in sandstone or granite (ALA 2022). Suitable habitat does not occur in or adjacent to the Project area.
Acriopsis emarginata	Pale chandelier orchid	V	***Unlikely***	*Preferred habitat (humid rainforest) is not present in Project Area.* An epiphytic orchid that grows on trees in hot humid lowland habitats such as rainforests, swamps and rainforest margins. Plants are frequently found occurring on paperbarks, palms and *Pandanus spp.*, and usually grow on the upper sections of tree trunks and on branches in the lower canopy. In palms they are often found growing in leaf bases with their roots visible in amongst the fibrous leaf sheaths. Occurs in far north-eastern Queensland from Cape York to the Daintree River (Jones *et al*. 2010), with records from the Daintree River area and Iron Range. Suitable humid rainforest habitat unlikely to be present in the Project Area.
Arenga australasica		V	***Unlikely***	*While preferred habitat (littoral rainforest) is present in Project Area, nearest record of occurrence is >50km from Project Area.* A multi-stemmed palm, occurring from islands in Torres Strait south to Hinchinbrook Island. Grows in littoral forest or near-coastal rainforest (Dowe 2010). Nearest record of occurrence is from Hope Vale.
Bruguiera x hainesii	Haines orange mangrove	CE	***Unlikely***	*Preferred habitat (mangrove forest) is not present in Project Area.* Large mangrove tree. A natural hybrid between *Bruguiera gymnorhiza* and *B. cylindrica* (Ono *et al*. 2016). In its only recorded occurrence in Australia, it grows in tidally inundated forest on a sheltered creek (Atlas of Living Australia). Suitable sheltered mangrove habitat is not present in the Project Area.
Cucurnis costatus		NT	***Unlikely***	*Preferred habitat (rocky and stony habitats) is not present in Project Area* A small, tendril-climbing vine recorded mostly from rocky and stony habitats, including open eucalypt forest, vine thickets, and the Little Annan crossing on the Mulligan Highway. Also recorded from soils derived from basalt (ALA 2022). It has a scattered distribution from Mareeba to Starcke, and west to Lakefield, however there are no records from dunefield habitats.
Cyclophyllum costatum		V	***Unlikely***	*Preferred habitat (mesophyll and notophyll rainforest) not present in Project Area; no records north of Cape Tribulation (>100km south of Project Area).* Shrub or small tree of mesophyll and notophyll rainforests in the Daintree River catchment, Windsor Tableland and northern Carbine Tableland (Atlas of Living Australia). No records north of Cape Tribulation. Suitable rainforest habitat is not present in the Project Area.
Dendrobium bigibbum	Cooktown orchid	V	***Possible***	*No records from Project Area but preferred habitat (littoral rainforest) is present.* Widespread on Cape York. Occurs in coastal scrub, littoral rainforests, riverine vegetation, monsoon thickets, vine thickets, swamps and gullies in open forest. Plants grow on trees and rocks and rapidly recolonise disturbed sites (Jones *et al.* 2010).

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				Recorded in the search area from rainforest on old, consolidated sand dunes (Atlas of Living Australia). No records from the Project Area. Littoral rainforest areas with the Project Area represent suitable habitat for this species.
Dendrobium carronii	Pink tea tree orchid	V	***Unlikely***	*Project Area is outside species known range (Lakefield to Bamaga).* Occurs in stunted open forests, especially adjacent to low-lying areas subject to occasional flooding. It is often found growing on *Melaleuca viridiflora* in bright, exposed situations and survives on trees on the margins of monsoonal thickets (Jones *et al.* 2010). Records in northern Cape York, from Lakefield to Bamaga (Atlas of Living Australia). Project Area is outside the species' known range.
Dendrobium johannis	Chocolate tea tree orchid	V	***Known***	*Recently recorded in Project Area.* Occurs in open humid habitats, close to swamps, in pockets of monsoon forest, and on slopes in open woodlands (Jones *et al.* 2010). This species flowers from March to July and has long-lasting flowers with an unpleasant odour. The apex of the column (pollinia) at the centre of the flower is purple. This distinguishes the species from the related and similar *D. trilamellatum* (syn. *D. semifuscum*), which flowers July to November, has a white column apex, and a pleasant scent (Jones *et al*. 2010). Recorded from dunefield habitat (Atlas of Living Australia). Suitable habitat occurs within the Project Area.
Dianella incollata		NT	***Unlikely***	A lanky, spreading herb or shrub with erect panicles of blue flowers. Grows only in rather dry sandy soil associated with sandstone outcrops, generally in open eucalypt woodland (Henderson 2020, ALA 2022). There are no records from dunefield habitats.
Donella lanceolata		NT	***Unlikely***	Tree of drier rainforests and gallery rainforests, northwards from Cooktown (ALA 2022). There are no records from dunefield habitats.
Habernaria rumphii (Pecteillis rumphii)		NT	***Unlikely***	Short-lived ground orchid, recorded from swampy open forest, open forest and open grassland with Pandanus (ala.org.au). Recorded from Cardwell to Iron Range. There are no records from dunefield habitats.
Habernaria xanthantha (Pecteilis xanthantha		NT	***Unlikely***	Short lived ground orchid, recorded from wet ground in Melaleuca woodland and open forest (ALA 2022). Recorded from the Cardwell area and Proserpine, with no records from dunefield habitats.
Hedyotis novoguineensis		E	***Unlikely***	Occurs in northeast Queensland from Mount Windsor to Tully in the south. Altitudinal range from near sea level to 660 m. Grows in rainforest, sclerophyll forest, Allocasuarina-Melaleuca woodland, Melaleuca swamp and in grassland (Zich et al 2020). One record from Starcke National Park (ALA 2022). Has not been observed/recorded in dunefield habitats.
Leichhardtia araujacea		CE	***Unlikely***	*Preferred habitat (gallery rainforest) is not present in Project Area.* Species occurs in rainforest (Atlas of Living Australia), including Blepharocarya gallery forest, associated with permanent water on conglomerate soils (Forster, 2019). Has not been observed/recorded in dunefield habitats.
Myrmecodia beccarii	Ant plant	V	***Known***	*Recently recorded in Project Area.* Observed growing as an epiphyte in Melaleuca arcana on access roads to the Project Area. Suitable habitat is present within the Project Area.
Phaius pictus	Forest swamp orchid	V	***Unlikely***	*Preferred habitat (humid rainforest) is not present in Project Area. Known only from McIlwraith Range and Bloomfield River.*

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				Occurs in north-eastern Queensland on the McIlwraith Range, and from the Bloomfield River to Kirrama Range between Tully and Cardwell. In humid rainforests, usually in sheltered sites close to streams or localised seepage areas. It can also be found growing among forest litter on boulders (Jones et al 2010). Has not been observed/recorded in dunefield habitats.
Phlegmariurus dalhousieanus	Blue tassel-fern	CE	***Unlikely***	*Preferred habitat (lowland littoral and riparian rainforest) and host species (Platycerium hillii) not present in Project Area.* This species is a high-light and high-humidity specialist epiphyte. In Malesia and in Australia it is a lowland littoral and riparian rainforest epiphyte. The Australian population is host-specific with *Platycerium hillii* (Field 2022a). No records of this species exist between Cairns and the Iron Range. Neither suitable habitat nor host plants are present in Project Area (Atlas of Living Australia).
Phlegmariurus squarrosus	Rock tassel-fern	CE	***Unlikely***	*Preferred habitat (humid rainforest) is not present in Project Area.* Restricted to a small area of foot slopes and gorges of the Wet Tropics mountains between the Mount Finnegan and the Tully River. A subcanopy epiphyte and lithophyte, usually near watercourses in brightly lit areas of humid rainforest at low to mid-montane altitudes. Uncommon to rare species in Australia that has declined dramatically in the southern part of its range due to the combined threats of poaching, habitat change, drought and cyclones (Field 2022b). No records in or near the Project Area (Atlas of Living Australia). Suitable humid rainforest is not present in or near Project Area.
Pseudolycopodiella limosa (Lycopodiella limosa)		NT	***Possible***	*Preferred habitat (shrublands)) in Project Area although beyond species' known distribution.* Suitable habitat is present in the Project area; however, the Project is outside of the species known distribution. Endemic to northern Cape York Peninsula, Queensland. This terrestrial species occurs in Melaleuca/Grevillea/Banksia spp. shrubland, wetlands and forest margins, usually in muddy to peaty organic soils (Field & Chinnock 2022). A similar species *Pseudolycopodiella serpentina* occurs in the Project area. *P. limosa* has leaves on its main branches >6 mm long, whereas *P. serpentina* has leaves <4.5 mm long.
Stackhousia sp. (McIvor River J.R. Clarkson 5201)		E	***Likely***	*Recent records from near Project Area in similar habitat (grassland)* Suitable habitat is present within the Project area. The species has been collected in grassland, behind a foredune, near the mouth of the McIvor River, approximately 7 km south of the Project area (ALA 2022).
Stylidium elachophyllum		E	***Unlikely***	*Preferred habitat (sedgelands) not present in Project Area.* A tiny, short-lived seasonal herb with a widely scattered distribution. Recorded from granite pavement on the Hann Tableland, in sedgelands with scattered Melaleuca on poorly drained clay soils near Elim Beach, and in seepage area on a gently sloping plain with Melaleuca spp. No records from dunefield habitats. No records from the Project area. Swamps in the Project area may provide marginal habitat for this species.
Xanthostemon arenarius	Heath panda	NT	***Known***	*Recent records in Project Area.* Tree growing up to 10 m tall. Suitable habitat and individual plants occur within the Project area (S. Worboys, pers. obs., November 2022).
Reptiles				
Caretta caretta	Loggerhead turtle	E	***Possible***	*High value feeding habitat (coral and seagrass) is not present in Project Area but is present in surrounding region; Project Area outside species nesting distribution.*

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				Major rookery sites for the loggerhead turtle occur in central and southern Queensland, with occasional nesting on GBR islands, and is unlikely to occur in the Project Area. Outside of breeding periods, loggerhead turtles transit between feeding habitat, occurring primarily around highly productive reef and seagrass sites. While the Project Area is not expected to support high value feeding areas, sites occur in the immediate region and turtles may therefore transit through the Project Area. The closest record is 60km away with few sightings regionally (WildNet).
Chelonia mydas	Green turtle	V	***Known***	*Listed as 'known' in the Project Area (supported by regional sightings)* PMST identifies the species as 'known' for the Project Area. Additionally, in recent years the green turtle has been confirmed previously from the embayment between Nob Point and Cape Bedford (BMT, unpublished), ~30km south of the Project Area. While the Project Area does not support extensive seagrass meadows for foraging, turtles are likely to transit through the site to high value habitat north and south. Isolated nesting could occur on the beaches adjoining the Project Area.
Crocodylus porosus	Estuarine crocodile	V	***Known***	*Known from adjoining areas region and anecdotal evidence of occurrence in Project Area.* Estuarine crocodiles occur in coastal areas of northern and north-eastern Australia. The species inhabits coastal rivers and wetlands, major rivers and wetlands on floodplains, and occasionally, the ocean (Cogger 2018). Habitat for estuarine crocodiles occurs in and adjacent to the Project area (lakes/wetlands/beach) and the species has been recorded in a wetland <1 km away (WildNet) and occurs elsewhere within the adjacent Cape Flattery Silica Mines (M. Newman, pers. obs., 2018-2022).
Ctenotus rawlinsoni	Cape heath ctenotus	V	***Likely***	*Preferred habitat (coastal heath) is present in Project Area; Project Area within key species distribution.* The cape heath ctenotus inhabits sandy and coastal heath. The species is known to occur only in the vicinity of Cape Flattery and nearby Cape Bedford (Cogger 2018, Biotropica 2021a; WildNet). Suitable habitat exists and there are numerous records of the species in and near the Project area (WildNet).
Dermochelys coriacea	Leatherback turtle	E	***Possible***	*Project Area is within species distribution and habitat but closest records are >150km away* The closest known sighting of the leatherback turtle is >150km away and regional sightings are sparse (WildNet). Nesting in eastern Queensland is rare and has been in decline over recent decades. While leatherback turtles can occur in shallow coastal waters, they are not associated with any particular benthic habitat features (e.g. reef assemblages) and commonly forage in deeper water and therefore would likely only transit through the Project Area.
Egernia rugosa	Yakka skink	V	***Possible***	*Preferred habitat (dry sclerophyll woodlands and forests) is not present in Project Area; species only known from inland, hinterland sites.* Yakka skinks occur in coastal areas and hinterlands of eastern Queensland. The habitat requirements of the yakka skink are poorly understood; however, the species is usually found in open dry sclerophyll woodlands and forests. Yakka skinks prefer to shelter among dense ground vegetation (Cogger, 2018). Record of the species existing ~30km southwest of the Project Area; the local has 10km error (Atlas of Living Australia) which is likely to be a countermeasure against illegal wildlife collection. Regardless, the record would be in an inland habitat unlike any in the Project Area. ***NOTE: While originally assessed as unlikely to occur, this species has been included in the list of species for consideration under the project EPBC Referral decision and is therefore included in scope.***
Eretmochelys imbricata	Hawksbill turtle	E	***Known***	*Listed as 'known' in Project Area; Project Area includes BIA habitat*

Scientific Name	Common Name	Status*	Likelihood of Occurrence	Occurrence description
				PMST identifies the species as 'known' for the Project Area. While the species primarily nests on offshore islands north of the Project Area (nesting rare south of Princess Charlotte Bay), the beaches of the local region are mapped as BIA for the nesting for the species and therefore conservatively assumed to support nesting activities.
Lepidochelys olivacea	Olive Ridley turtle	E	***Likely***	*Project Area is within species distribution and habitat* The closest sighting of the species is >80km away at Lizard Island (Atlas of Living Australia). However, the olive Ridley turtles are known to forage over soft-bottom habitats in nearshore waters and therefore may occur in the Project Area.
Natator depressus	Flatback turtle	V	***Likely***	*Listed as 'known' in Project Area but outside of species preferred distribution (outer GBR); conservatively assumed to be 'likely'* PMST identifies the species as 'known' for the Project Area and there have been numerous sightings regionally. However, the closest sighting of the species is >80km away at Lizard Island (Atlas of Living Australia). Further, flatback turtles more commonly occur in the outer GBR around soft bottomed habitats. Nesting occurs on major continental islands of the southern GBR with no nesting north of Townsville (>500km south). Due to the discrepancy in PMST records and preferred distribution, the species is conservatively assumed to be 'likely'.
Tiliqua scincoides intermedia	Northern bluetongue	CE	***Unlikely***	*Project Area and broader region is not within species distribution.* Bluetongue lizards are found in a broad variety of climates and habitats throughout most of Queensland, and also in the northern NT, eastern NSW, Victoria, and south-eastern SA (Cogger 2018). The northern subspecies (T. s. intermedia) occurs across the wet-dry tropics, from northwestern Queensland (i.e. west of Cape York), to the Mt Isa district near Cloncurry, west to the Kimberley region of WA including Groote Eylandt and Melville, Milingimbi and Mornington Islands, and Groote Eylandt (DAWE 2021). The northern subspecies does not occur in the Project region.

*Listing is as per *Nature Conservation (Animals) Regulation 2020* and *Nature Conservation (Plants) Regulation 2020*. CE: Critically Endangered, E: Endangered, V: Vulnerable, NT: Near Threatened.
Known: Records or strong anecdotal information of presence from Project Area; Likely: species has a high possibility of occurring due to a combination of factors, including presence of suitable habitat, species distribution and known sightings in adjoining areas; Possible: species could occur based on suitable habitat and/or known sightings in adjoining areas; Unlikely: species is unlikely to occur either due to lack of suitable habitat or distance to known distribution.

Impacts and Assessment Requirements

The project will introduce the following impacting processes relevant to flora and fauna:

- Clearing of native vegetation – while vegetation will be rehabilitated, there will be a lag time between clearing and full rehabilitation, during which time there will be a temporary loss of habitat value.
- Construction and operational noise (i.e. machinery, conveyor).
- Construction and operation of coastal infrastructure, to the extent the shoreline conveyor option is adopted.
- Construction and operation of maritime infrastructure within port limits, including piling for jetty infrastructure and placement of rock.
- Construction and operational vessel movement.

Terrestrial habitat impacts are unlikely to pose a negative impact to any threatened flora or threatened or migratory fauna. The threatened flora species potentially in the impact area consist of species that can be translocated to suitable habitat elsewhere, while threatened and migratory fauna are not expected to be reliant upon the Project Area comparative to other similar habitat in the broader region.

Coastal infrastructure could have impacts on marine turtles, especially where conveyor infrastructure interferes with areas that would otherwise be utilised for nesting. This will require management through the use of buffers and other arrangements.

The construction of maritime infrastructure could also affect marine megafauna such as turtles and dolphins. However, this can be managed through standard marine construction measures, including use of buffers and observers. Similarly, increased vessel movements associated with barges and additional OGVs access the port can be managed through existing port and maritime safety controls that aim at minimising the risk of vessel strike and other impacts. Note that the number of additional vessel movements attributed to the project will be an average of one OGV movement per week.

Noting the above, the intended focus for the EIS will be:

- Ground-truthing of mapping of vegetation communities
- Targeted surveys for protected flora species
- Targeted surveys for terrestrial fauna species, including identification of any important breeding habitat or other areas
- Beach surveys to identify potential turtle nesting activity and/or suitability of beach for turtle nesting
- Mapping of marine habitat, including identification of any sensitive habitat types (e.g. seagrass).

Underwater noise modelling is not proposed as part of the EIS. While noise modelling provides the opportunity to better understand mitigation measures for piling and other noise-generating activities, it is not anticipated to material affect the understanding of environmental risk for the purposes of the impact assessment. Rather, it is proposed to be undertaken as a post-approval activity to define buffer zones and similar measures to be implemented during construction works.

Surveys for vegetation and species will be undertaken in accordance with prevailing state and federal government guidelines, including seasonal surveys as necessary to identify different species.

4.7 Coastal Environment

The Project Area lies within a broadly crenulate-shaped beach and dune system spanning from Cape Bedford in the south and Cape Flattery in the north. The coastal waters are largely protected from oceanic swell within the GBR lagoon; however the coastline is exposed to relatively uninterrupted lagoon wind/wave fetches (~30 km). There are numerous offshore and nearshore reefs and islands that will influence the coastal wave climate and littoral sediment transport regime. This influence is evident in the tombolo shoreline features along the southern flank of the crenulate embayment.

Coastal currents in the NSP study area will be primarily driven by tide and wind but may also be influenced to a lesser extent by regional circulation and by wave action in the littoral zone.

The coastal portion of the NSP overlaps the coastal management district and areas mapped for coastal erosion risk, as shown in Figure 4.7.

As the catchment for the marine environment is mostly undeveloped (except for the CFSM mining activities) water quality in the embayment south of Cape Flattery is anticipated to be mostly clean and high quality. No specific water quality monitoring data is available for this area, however.

The ecology associated with the coastal and marine environment is described in Section 4.6.

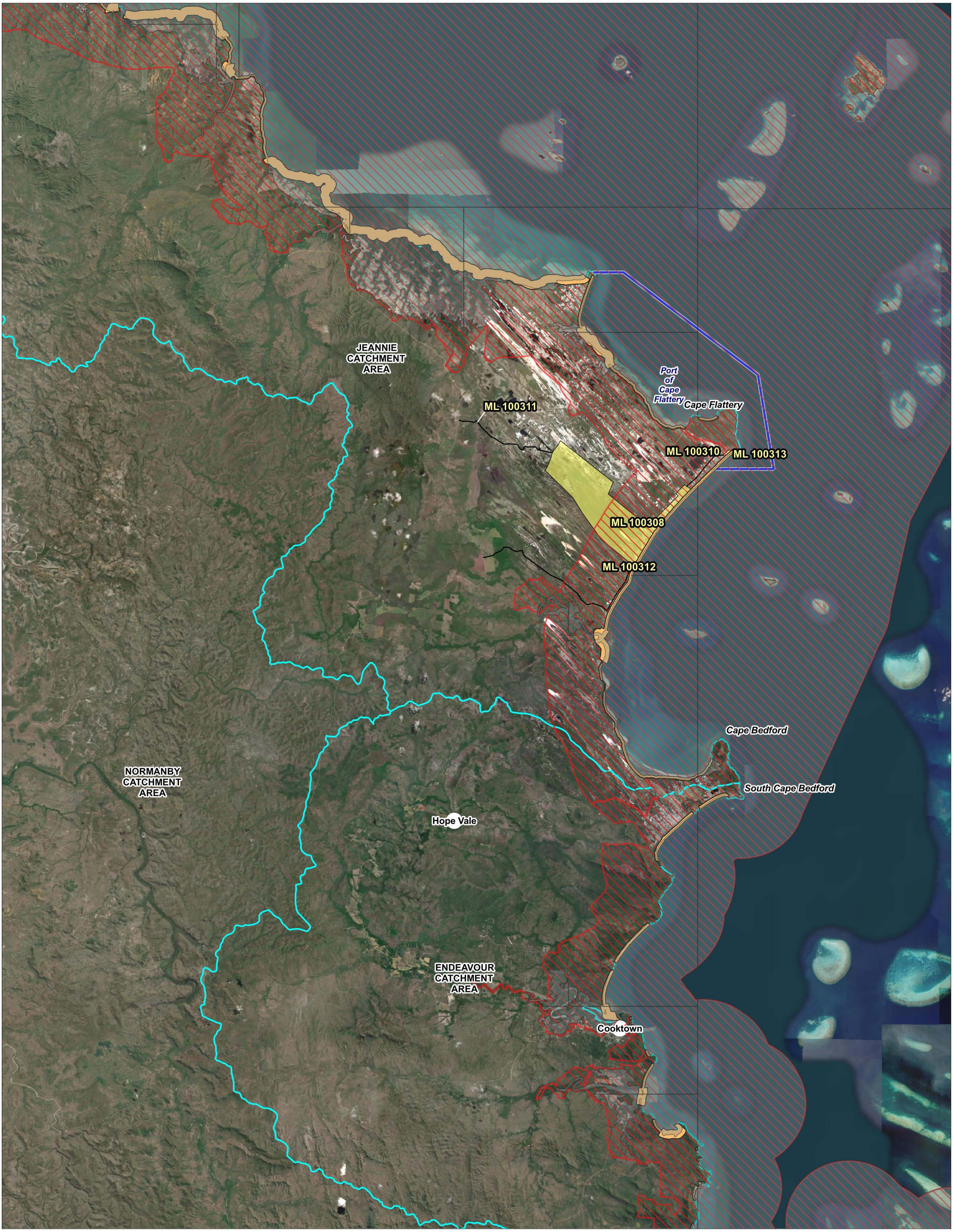
The marine components of the Project Area are within the Port of Cape Flattery. The port currently exclusively supports the export of silica product from the CFSM, at a rate of ~3Mtpa. This occurs through a single wharf structure that supports mooring of OGVs. Silica product is conveyed along the structure to vessels via a conveyor. The wharf structure is owned by Ports North but managed by CFSM while the supporting conveyor and loading infrastructure is owned and operated by CFSM. The land and waters within the declared port limits surrounding the wharf are part of the Great Barrier Reef World Heritage Area but are excluded from the boundaries of both the Federal and State Marine Parks.

CFSM also has a private barge ramp and small jetty structure located in the bay northwest of Cape Flattery. As a private structure this does not form part of the port assets but is located within port limits.

Based on current rates of production, vessels load and depart from the port with silica product at a rate of one per week. From the port, vessels transit east/northeast to the main shipping channel (~2.5 km east of the wharf).

No other marine activities currently occur in the marine component of the Project Area due to exclusions associated with port limits.

Onshore, the dune landscape of the Cape Flattery to Cape Bedford resource region is a significant local landform with high local amenity and environmental values. Within this landscape, there are a series of freshwater lake systems either perched or fed through groundwater system, which potentially represent key ecological features. These are described further in Section 4.4.



LEGEND

- Port Limits
- Erosion prone area (component 1 of 3 40m on HAT)
- Erosion prone area (component 2 of 3 calculated erosion distance)
- Water Plan Catchments
- Coastal Management District

Title:

Coastal Mangement District and Erosion Zones

Figure: 4.7

Rev: A

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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Impacts and Assessment Requirements

Impacts and assessment requirements related to marine water quality are described in Section 4.4.1.

Coastal processes could be impacted through the introduction of new physical infrastructure in the marine environment, especially the barge ramp. To understand these impacts, assessments will be undertaken to understand the hydrodynamic conditions in this area. Additionally, these measures will inform the design of infrastructure to ensure it is suitable for the range of wave and tidal conditions experienced in the area.

In this context, the EIS will include collection of metocean and marine water quality data within the port site (likely near the proposed barge ramp location) and numerical modelling to determine design criteria and assess the impacts of new maritime infrastructure.

Numerical modelling of vessel wake or other plume impacts is not considered necessary due to low risk of plumes from project activities.

4.8 Air Quality

Due to the undeveloped nature of the broader Project Area and surrounds, there are minimal industrial emissions in the region. Currently, there is no air quality monitoring data within the Cape Bedford area obtained from the Queensland Government. The closest air quality monitoring station is in Cairns, over 200 km south of the Project.

The current air quality along both Access 1 and Access 2 Road corridors are not known. However due to its rural setting it is likely that low traffic volumes are present and therefore is expected to have high air quality.

The only emissions anticipated are dust and plant emissions associated with mining at the CFSM and operations at the Port of Cape Flattery. Using the National Pollutant Inventory (NPI) database, Table 4.4 below provides air emission data from CFSM 2021-2022 environmental report.

Table 4.4 Cape Flattery Silica Mines emission report 2021/2022

Substance	Air total (kg)	Air Fugitive (kg)	Air Point (kg)	Land (kg)	Water (kg)	Total (kg)
Carbon monoxide	97,000	7,800	89,000	-	-	97,000
Cumene	4	-	4	0.024	-	4
Lead & compounds	0	-	0	-	-	0
Oxides of Nitrogen	220,000	22,000	200,000	-	-	220,000
PM10	13,000	2,100	10,000	-	-	13,000
PM2.5	12,000	1,800	10,000	-	-	12,000
PAHs	1.8	0.97	0.82	0.091	-	1.9
Sulphur dioxide	120	15	110	-	-	120
Total Nitrogen	-	-	-	-	170	170
Total Phosphorus	-	-	-	-	40	40
Total VOCs	11,000	2,500	87,00	-	-	11,000
Xylenes	23	-	23	0.011	-	23

Impacts and Assessment Requirements

At present, an emissions inventory has not been developed for the project. However, given the similarity of mining processes to what is in place for the CFSM, the inventory is anticipated to consist of the same substances as noted in Table 4.4.

For the EIS, a full emissions inventory will be developed for the project, including Scope 1 and 2 greenhouse gas emissions. Additionally, an assessment will be undertaken of potential dust emissions from mining and other operations. This may not involve numerical modelling due to the lack of sensitive receptors in the area.

4.9 Noise and Vibration

As for air, due to the lack of industrial or residential development in the region, there are minimal existing noise sources in the Project Area. The only significant sources are those related to CFSM activities and the operation of the Port of Cape Flattery. There are no 'human' sensitive receptors from the Project Area other than the proposed mining camp (operated by the proponent) and adjacent mining operations at CFSM. The nearest sensitive receptor is the Australian Kite Surfari hotel and Elim beach campground located >20 km southeast of the Project. Due to the remote location of the Project, it is unlikely that the Project will pose significant impacts on the amenity. A visual amenity and landscape assessment will be undertaken however to assess impacts to this value including potential visual impacts observed from marine areas (in the GBRWHA).

Any potential impacts on flora and fauna can be found in Section 4.6.

Impacts and Assessment Requirements

The potential emission sources from the Project could include:

- The construction and operational phase of the mine and ancillary infrastructure
- The construction and operational phase of barge facilities
- Upgrades and maintenance to both Access 1 and 2 Road corridors

Appropriate PPE will be provided to mitigate impacts on personnel. Consistent with the CFSM (cf. Ports North, 2014), no numerical modelling of noise and vibration is proposed for the EIS. Rather, noise assessments will be undertaken to determine a list of emissions and estimate potential impacts and associated management measures.

See Section 4.6 regarding underwater noise and vibration.

4.10 Waste Management

Impacts and Assessment Requirements

There are no major waste streams expected as part of the NSP other than reject sands. The processing of silica sand does not produce contaminated tailings, allowing material to be retained on site for rehabilitation.

Approximately 20% of all ore mined will be converted to reject sands (i.e. product to reject ratio of 80:20) which will be placed back in mining areas as part of land reforming and rehabilitation. Based on this ratio, approximately 30Mt of reject sands would be produced for the 151Mt mined over the 25 years of the mine.

Water used in processing is intended for reuse on site or reinjection into the groundwater system. Silica processing extracts all sediment and impurities from the water. The only potential contaminants for reinjection, therefore, will be any flocculants used in processing (noting that no chemicals are proposed for use in processing). Flocculants are typically inert but can have a toxic effect to aquatic ecosystems in high concentrations. Releases will need to be managed, therefore, to prevent high concentration build up. However, where this is appropriately managed (e.g. through dilution of release streams, use of biodegradable flocculants), impacts are not expected. This will be assessed as part of the EIS.

Waste will be generated through accommodation facilities and general activities. Temporary and permanent solutions for waste management will be identified as part of the EIS process, taking into account the capacity of existing facilities in the area. Note that no permanent onsite landfill is proposed as part of the project.

4.11 Hazards and Safety

The project does not involve the introduction of any hazardous substances. It is also not expected to materially affect the risk associated with any existing hazards in the area.

The most relevant hazards for the Project Area are:

- Bushfire
- Wildlife.

The Project Area is mapped as a bushfire hazard area under the Hope Vale Planning Scheme, reflecting the risk of bushfire during drier months of the year. Mining operations will need to be managed to avoid introducing fire sources and to control any fire that may occur in the area.

The Project Area is also known to contain crocodiles which will pose a wildlife risk to mining staff. Given crocodiles occur within close proximity to waterbodies, buffers will be established between mining and infrastructure areas and waterbodies to minimise potential risks.

Impacts and Assessment Requirements

As part of the EIS, framework hazard management plans will be developed, including a Bushfire Management Plan and Crocodile Management Plan. These will form the basis of more detailed plans to be developed post approval. Additionally, Diatreme will liaise with Ports North and Hope Vale Aboriginal Shire Council regarding the provision of resourcing and institutional support to local disaster management arrangements to allow for appropriate response to on land, maritime and/or shipping hazard events.

4.12 Cultural Heritage

Diatreme commissioned a preliminary cultural heritage scoping study (Niche 2022) to identify what baseline data collection and technical assessments were required to support environmental assessments and approvals for the Project. The scope of works included a detailed desktop assessment (DDA) consisting of:

- Searches of relevant local, state and Commonwealth historical and Aboriginal registers and databases to identify known cultural heritage places
- A review of available cultural heritage studies and previous cultural heritage assessments provided by Diatreme of the Project Area

- Desktop analysis of available historical aerial imagery of the Project Area to establish the extent of historical land use activity disturbances and identify any high-risk landscapes or geographic areas

- Recommendations based on an understanding of currently known and potential presence of Aboriginal and historical cultural heritage within the Project Area and requirements and obligations under relevant legislation.

The searches identified in the DDA can be observed in Table 4.5.

Table 4.5 Statutory and Non-statutory database search result

Database	Site Name	Class / Site Type	Location to Project Area
Statuary Database			
World Heritage List	Great Barrier Reef	Natural	Adjacent to landside components of Project (e.g. mining) Overlays marine components of Project (e.g. maritime infrastructure and shipping)
National Heritage List	Great Barrier Reef	Natural	As per GBRWHA
	Quinkan Country	Natural	>60km southwest of Project Area
Non-Statutory Database			
Register of the National Estate	Cape Bedford/Cape Flattery Dunes	Natural	Overlays landside components of Project (e.g. mining)
Australasian Underwater Cultural Heritage Database	Jedda	Shipwreck	>5km north of Project Area (north of Cape Flattery)
	Pilot	Shipwreck	>5km northeast of Project Area (east of Cape Flattery)
	Unidentified Cape Flattery No.1	Shipwreck	>5km south of Project Area (south of Cape Flattery)

Several known heritage sites were identified in the Project Area as shown through searches of the DSDSATSIP register, the National Heritage List, the Australasian underwater cultural heritage database, and previous heritage reports. These are shown in Figure 4.8 and Figure 4.9. An assessment of historical aerial imagery shows that the Project Area has been subject to minimal Significant Ground Disturbance and Surface Disturbance in the past. However, a detailed visual inspection for this Project has not yet been undertaken.

The proposed activities associated with mining are assessed as Category 5 for all areas under the Duty of Care (DoC) Guidelines pursuant to the Aboriginal Cultural Heritage (ACH) Act. On this basis, the desktop review of the local archaeological context of the Project Area has identified that there exists a high potential for the Project activities to impact Aboriginal cultural heritage without greater survey effort and development of appropriate mitigation measures. Note this categorisation is based on the nature of the activity as involving clearing and land disturbance and does not inherently indicate a high risk of cultural heritage disturbance comparative to other sites.

Impacts and Assessment Requirements

Cultural heritage surveys and assessments will be undertaken to identify the presence of indigenous and non-indigenous heritage features.

Under the ACH Act, CHMPs will be required with relevant Aboriginal groups within the Project Area. While these plans are not required to be completed as part of the EIS, the development of CHMPs typically occurs in parallel with EIS studies and includes the collection of cultural heritage information. Noting this, Diatreme intends to undertake cultural heritage negotiations to inform both the EIS and CHMP processes. This will include engagement with each of the three RNTBCs relevant to the Project Area.

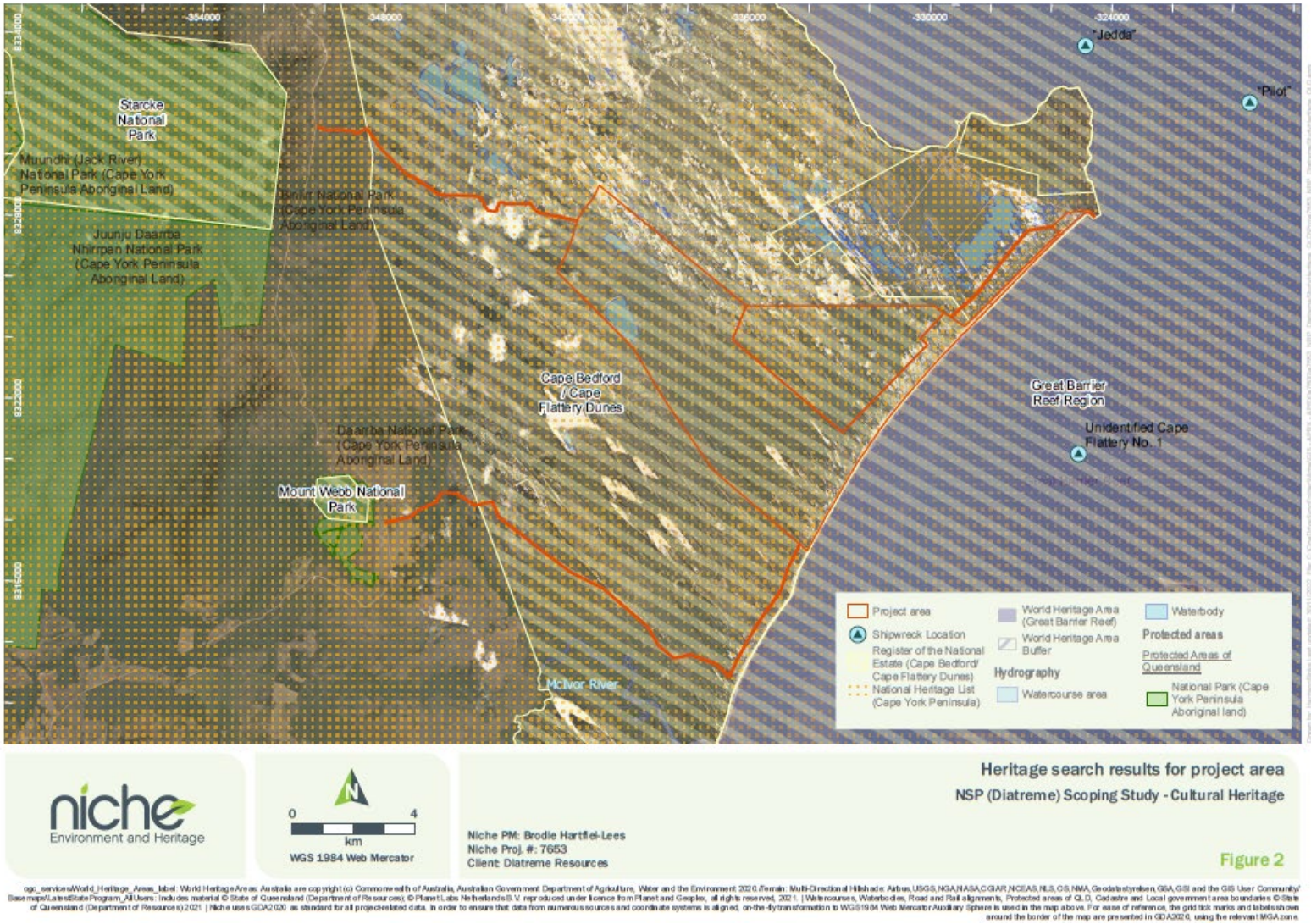

Figure 4.8 Heritage search results for Project Area

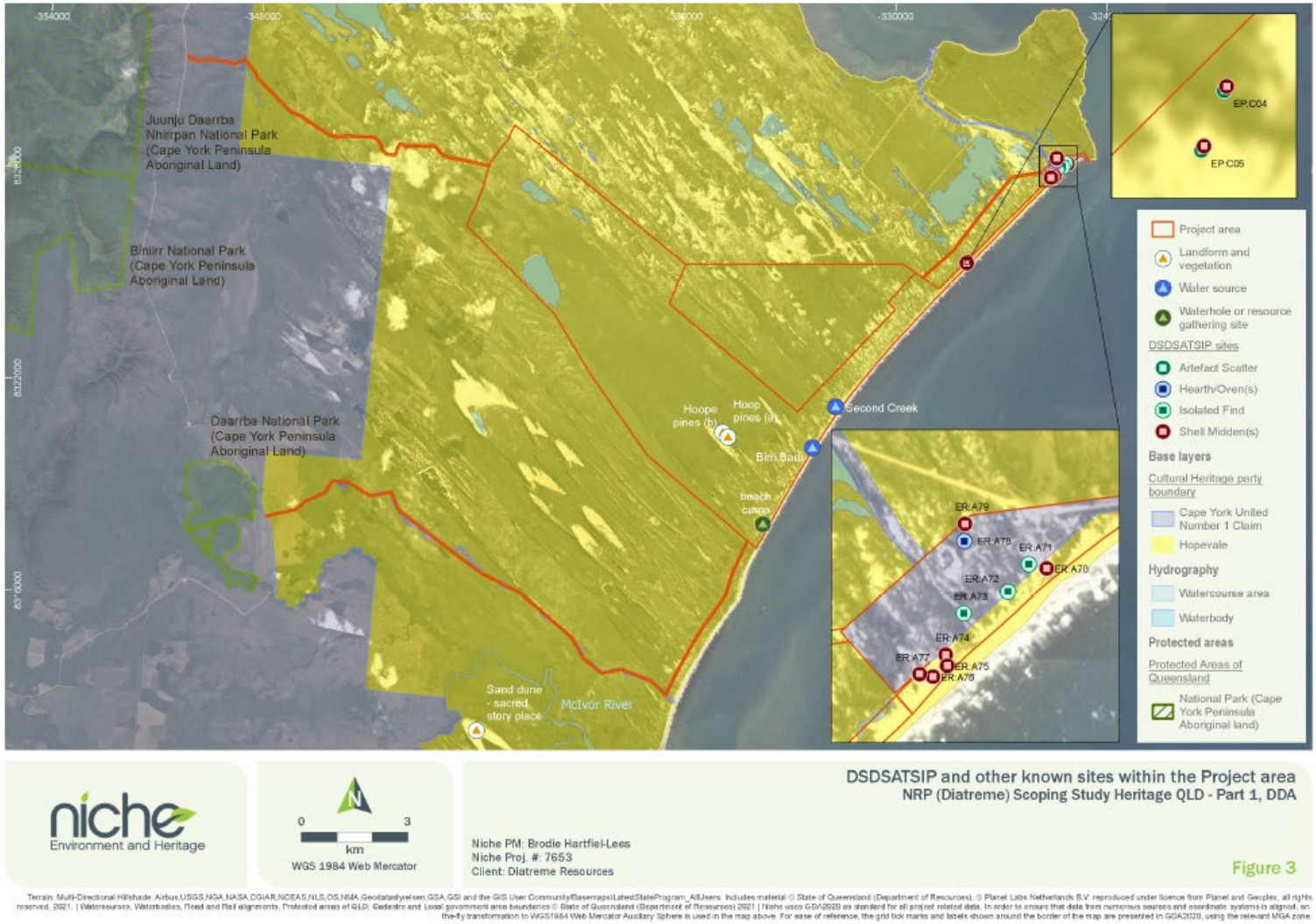

Figure 4.9 DSDATSIP and other known sites in the Project Area

4.13 Social

As per Figure 2.10, the communities for the purposes of an SIA consist of Hope Vale, Cooktown, Rossville, Laura, Lakeland, Wujal Wujal and Bloomfield. Based on Diatreme's intended employment and development strategy, the main community for the purposes of social impacts and benefits will be the Hope Vale community. Key demographic and other information for the community is available from the 2021 census. This includes the following:

- Population size and growth
  - Population of 977 (compared to 976 in 2016)
  - Indigenous population of 863 (88% of total population)
- Age structure
  - >50% of population <30 years of age (53%)
  - 37.1% of population <20 years of age
  - <6% of population 65+ years of age
- Educational attainment (for people aged 15 years and over)
  - 32.1% with post-school degree (Certificate III or IV, diploma, Bachelor's degree or above)
  - 45.5% with at least Grade 12
  - 69.6% with at least Grade 10
- Income and employment (for people aged 15 years and over)
  - 42% in the labour force, 50.3% not in the labour force (7.4% not stated)
  - 49.7% of the labour force employed full time, 21.2% employed part-time, others away from work or unemployed at time of census
  - Top occupations are community and personal service workers (26%), professionals (16.3%), machinery operators and drivers (14.5%), clerical and administrative workers (10.6%), labourers (8.4%), technicians and trades workers (7.9%), managers (5.3%) and sales workers (4.4%)
  - Primary employers are local government (24.2%), mining and quarrying (7.0%), primary education (6.2%), hospitals (4.8%) and combined primary and secondary education (4.4%)
  - Median weekly income for a person is $386, for a family is $874 and for a household is $836

Based on these high-level characteristics, Hope Vale can be described as a small community with a young population and mixed levels of engagement within the formal workforce. Key work opportunities to date are within service and administrative based industries within Hope Vale as well as for the CFSM mine to the north.

Impacts and Assessment Requirements

The potential economic and employment benefits of the project are set out in Section 4.14. In accordance with the SSRC Act, these benefits together with potential impacts will be assessed through an SIA. This will include consideration of the immediate Project Area and the broader communities, including Hope Vale and Cooktown and other communities in the 125km radius. The SIA will also include arrangements associated with workforce management, housing and accommodation, procurement from local businesses and industry, and health and community wellbeing, as per the

Coordinator-General's SIA Guideline. This will be undertaken in parallel with extensive community and stakeholder engagement, including with Traditional Owner groups. See also Section 3.4.

An SIMP will be developed in parallel with the SIA, including commitments from Diatreme focused on supporting the local community and maximising benefits.

To support the development of the SIA, surveys will be undertaken within the local communities to support data obtainable through census and related public datasets.

4.14 Economic

The NSP will produce tangible benefits to the region that will improve the welfare of local communities including First Nations communities.

Initial employment estimates for the project are as follows:

- Construction work force – at least 120 jobs
- Operational work force – at least 90 jobs

As outlined most workers will be sourced from the townships of Hope Vale and Cooktown, with others potentially coming from further townships (e.g. Rossville, Wujal Wujal, Lakeland, Laura) depending on work force demands. They will be accommodated in Hope Vale and Cooktown during construction (and transported to site via bus) and then on an onsite mine camp during operation.

Diatreme has an initial First Nation's employment target of 60% that will be tracked by key performance indicators (KPIs). This process has already commenced with a number of local employees engaged by Diatreme based in Cooktown and Hope Vale to support the project. The MPAs between Diatreme and Traditional Owner representative groups are still ongoing and forecast to be completed by the end of 2023.

The project will involve between $400 million and $550 million of capital expenditure from DRX for mine establishment and operation. This excludes additional expenditure that could be required to facilitate upgrades of port infrastructure at the Port of Cape Flattery.

The Scoping Study developed for the project has identified financial returns across a range of metrics. These are presented in Section 2.1.

4.15 Transport

Impacts and Assessment Requirements

Transport processes for the project will include road and sea transportation. The transport requirements for the project include building one of the following access roads.

- MLA100311 Starcke-Northern Silica Access 1 – this is an MLA for mining infrastructure, representing the preferred of two options for an access road to the site from Starcke Road
- MLA100312 Starcke-Northern Silica Access 2 – this is an MLA for mining infrastructure, representing the alternative option for an access road to the site from Starcke Road.

These will provide for access for machinery, equipment and personnel to and from the Project Area. As part of the EIS, a final option for access will be selected. The EIS will also provide relevant information for the design of road infrastructure, including requirements for waterway crossings and clearing.

As noted elsewhere, silica product will be exported through the Port of Cape Flattery. Works are ongoing to design the export option, including selection of the preferred option, design of material handling and throughput, and development of a conveying and ship loading methodology. As part of the EIS, a final option for export will be selected.

Additional traffic will likely dock at the Port of Cape Flattery as a result of the project being approved. These additional ships would be using the existing shipping lanes through the GBR to their export destinations in Asia. This would primarily utilise the Inner GBR Route, as indicated in Figure 4.10. OGVs with a nominal capacity of 55,000t will be used to ship the product. This equates to 4-5 vessels per month for the 3Mtpa production rate, and 7-8 vessels per month for the 5Mtpa production rate.

If sea access is granted with the proposed barge ramp facilities for the project or use of CFSM barge ramp, then it is likely importation of supplies and material will be done through local boat ramps near the mine and not at Port of Cooktown. Emergency services and evacuation will be available through the following means:

Exploration & Development

- Emergency management plan in place with evacuation points throughout the project area to enable helicopter evacuation during a serious incident.
- Utilisation of local medical facilities at Hope Vale and Cooktown

Construction and Operations

- Development of a project specific emergency management plan for the construction and operations phase of the project.
- On site helipads to enable emergency evacuation
- On site medial staff
- Good site road access and utilisation of local medical facilities at Hope Vale and Cooktown

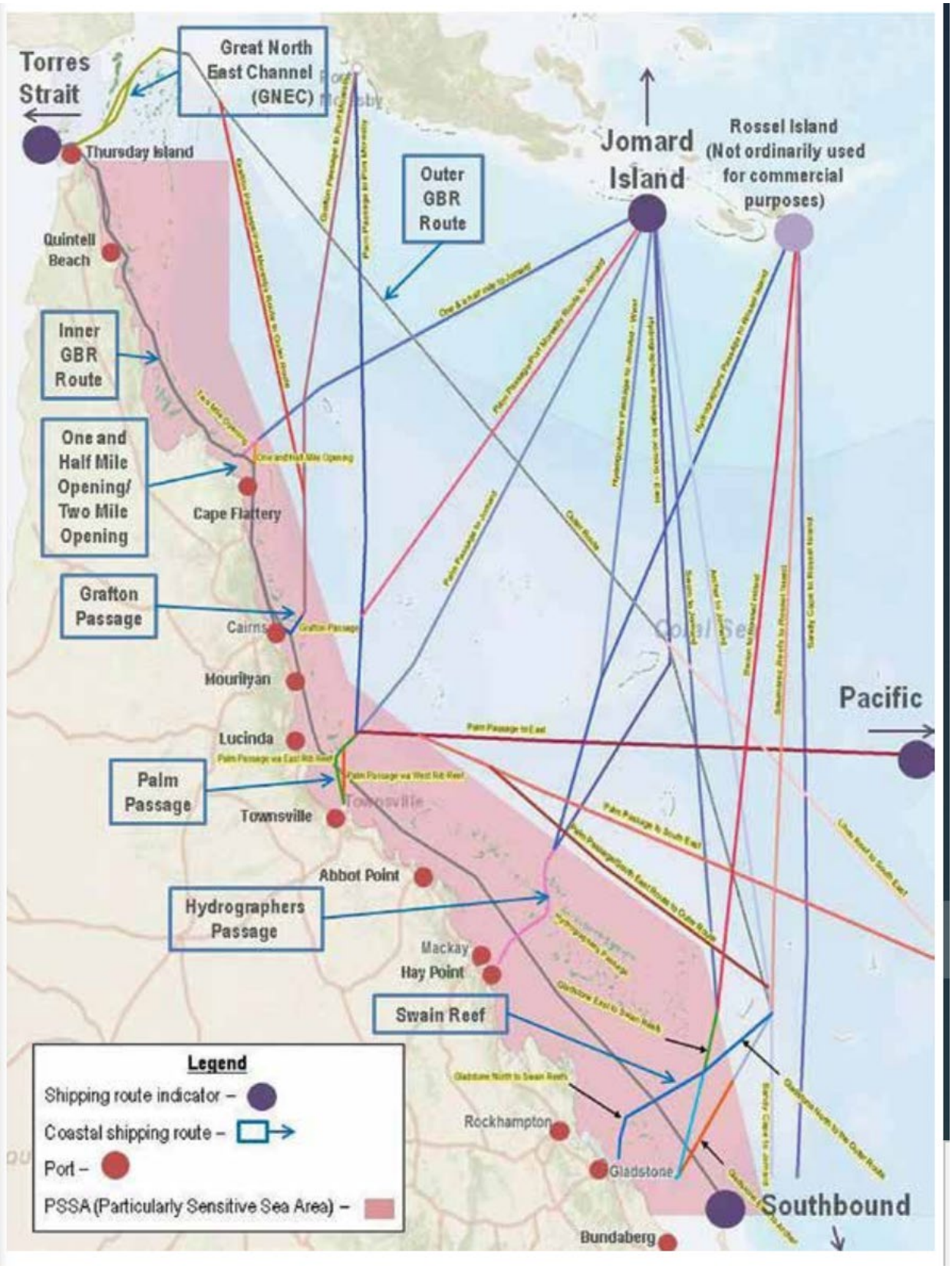

Figure 4.10 Shipping lanes as per the North-East Shipping Management Plan (NESMG, 2014)

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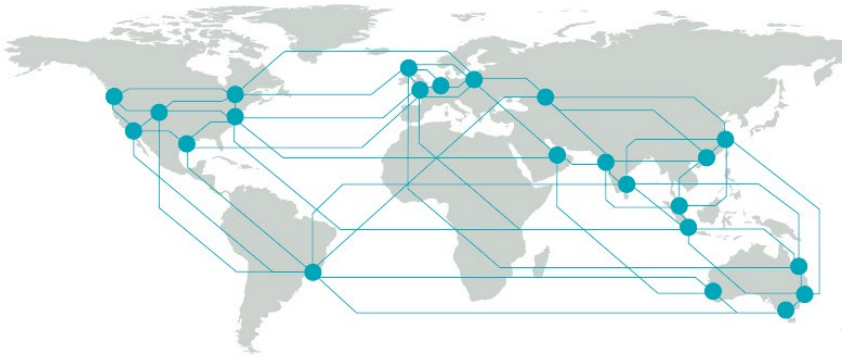
6 Glossary, Acronyms and Abbreviations

ACH Act	*Aboriginal Cultural Heritage Management Act 2003* (Qld)
ALA	*Aboriginal Land Act 1991*
CFSM	Cape Flattery Silica Mine
CHMP	Cultural Heritage Management Plan
Coastal Act	*Coastal Protection and Management Act 1995* (Qld)
DES	Queensland Department of Environment and Science
DoR	Queensland Department of Resources
EA	Environmental Authority
EIS	Environmental Impact Statement
EP Act	*Environmental Protection Act 1994* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPM	Exploration permit for minerals or coal
ERA	Environmentally relevant activity
GBR	Great Barrier Reef
HES	High ecological significance
HVAC	Hope Vale Aboriginal Corporation
IAS	Initial Advice Statement
IMRA	Initiative for Responsible Mining Assurance
IS	Infrastructure Sustainability
ISCA	Infrastructure Sustainability Council of Australia
JV	Joint Venture
ML	Mining Lease
MLA	Mining Lease Application
MPA	Mining Project Agreement
MR Act	*Mineral Resources Act 1989*
NC Act	*Nature Conservation Act 1992* (Qld)
NHMRC	National Health and Medical Research Council
NSP	Northern Silica Project
OGV	Oceangoing vessel
Ports North	Far North Queensland Ports Corporation Ltd
PRCP	Progressive Rehabilitation and Closure Plan
PWTP	Potable water treatment plant
RDMW	Queensland Department of Regional Development, Manufacturing and Water

RE	Regional ecosystem
RNTBC	Registered Native Title Body Corporate
SIA	Social Impact Assessment
SIMP	Social Impact Management Plan
SSRC Act	*Strong and Sustainable Resource Communities Act 2017* (Qld)
TEC	Threatened ecological community
ToR	Terms of Reference
UF	Ultrafiltration
UV	Ultraviolet
WAC	Walmbaar Aboriginal Corporation



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