

Permit

Environmental Protection Act 1994

Environmental authority EPML00550113

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

Environmental authority number: EPML00550113

Environmental authority takes effect on 09 February 2023

Environmental authority holder(s)

Name(s)	Registered address
CAPE FLATTERY SILICA MINES PTY LTD	Cairns Corporate Tower Level 15, 15 Lake Street CAIRNS QLD 4870 Australia

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Ancillary 31 - Mineral processing 2: Processing, in a year, the following quantities of mineral products, other than coke (b) more than 100,000t	ML2806, ML2965, ML40048, ML7069
Schedule 3 12: Mining mineral sand	ML2806, ML2965, ML40048, ML7069
Schedule 3 09: A mining activity involving drilling, costeaning, pitting or carrying out geological surveys causing significant disturbance	ML2806, ML2965, ML40048, ML7069
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (b-i) more than 100 but not more than 1500EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	ML2806
Ancillary 60 - Waste disposal 2: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(b) (a) 50t to 2000t	ML2806
Ancillary 08 - Chemical Storage 3: Storing more than 500 cubic metres of chemicals of class C1 or C2	ML2806

Environmentally relevant activity/activities	Location(s)
combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)	
Schedule 3 10: Investigating the potential development of a mineral resource by large bulk sampling or constructing an exploratory shaft, adit or open pit	ML2806, ML2965, ML40048, ML7069

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

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

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

Contaminated land

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

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

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

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

Take effect

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

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

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Sustainable Planning Act 2009* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

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

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

T. Gibbs

Signature

9 February 2023

Date

Teale Gibbs
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Mineral Business Center
Department of Environment and Science
Phone: 07 4222 5352
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Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

Location: Mining Lease ML2806
 Cape Flattery
 Mining Lease ML2965
 Cape Flattery
 Mining Lease ML40048
 Cape Flattery
 Mining Lease ML7069
 Cape Flattery

This **environmental authority** incorporates the following schedules:

Schedule A—General
Schedule B—Air
Schedule C—Water
Schedule D—Noise & Vibration
Schedule E—Waste
Schedule F—Land
Schedule G—Community
Schedule H—Definitions
Schedule J—Maps and Figures

Schedule A - General

- (A1-1) This environmental authority authorises the production of up to approximately 3,500,000 tonnes per year of product.

Financial Assurance

- (A1-2) Provide a financial assurance in the amount and form required by the administering authority prior to the commencement of activities proposed under this environmental authority.

NOTE: The calculation of financial assurance for condition (A1-1) must be in accordance with Guideline 17 and may include a performance discount. The calculation of financial assurance for must be in accordance with Guideline 17. The amount is defined as the maximum total rehabilitation cost for complete rehabilitation of all disturbed areas, which may vary on an annual basis due to progressive rehabilitation. The amount required for the financial assurance must be the highest Total Rehabilitation Cost calculated for any year of the Plan of Operations and calculated using the formula: (Financial Assurance = Highest Total Annual Rehabilitation Cost x Percentage Required)

- (A1-3) The financial assurance is to remain in force until the administering authority is satisfied that no claim on the assurance is likely.

NOTE: Where progressive rehabilitation is completed and acceptable to the administering authority, progressive reductions to the amount of financial assurance will be applicable where rehabilitation has been completed in accordance with the acceptance criteria defined within this environmental authority.

Maintenance of Measures, Plant and Equipment

- (A2-1) The holder must:
- (a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; and
 - (b) maintain such measures, plant and equipment in a proper condition; and
 - (c) operate such measures, plant and equipment in a proper manner.

Monitoring

- (A3-1) Record, compile and keep for a minimum of five years all monitoring results required by this environmental authority and make available for inspection all or any of these records upon request by the administering authority.
- (A3-2) Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

Storage and Handling of Flammable and Combustible Liquids

- (A4-1) Spillage of all flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm (other than trivial harm) and maintained in accordance with the most recent version of *AS 1940 - Storage and Handling of Flammable and Combustible Liquids*.
- (A4-2) All piping and infrastructure associated with the loading and unloading of petroleum products must be designed, constructed and maintained in accordance with the most recent version of *AS1940 – Storage and Handling of Flammable and Combustible Liquids*.

Definitions

- (A5-1) Words and phrases used throughout this EA are defined in Schedule H – Definitions. Where a definition for a term used in this EA is sought and the term is not defined within this EA, the definitions in the *Environmental Protection Act 1994*, its Regulations and Environmental Protection Policies must be used.

Notification of Emergencies, Incidents and Exceptions

- (A6-1) You must, as soon as practicable after becoming aware of:
- (a) any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority; or
 - (b) any monitoring result that indicates an exceedance of any environmental authority limit, notify the administering authority of the release by telephone, facsimile or other electronic means.

Exploration

- (A7-1) All exploration activities carried out on the mining leases must comply with each of the Standard Environmental Conditions contained in the most recent version of the Code of Environmental Compliance for exploration and mineral development projects.

Acid Sulfate Soils

- (A8-1) Acid sulfate soils must be managed such that contaminants are not directly or indirectly released from the works to any waters.
- (A8-2) When treating and managing acid sulfate soils, the latest edition of the Queensland Environmental Protection Agency's "Instructions for the Treatment and Management of Acid Sulfate Soils, 2001", must be complied with.

New Service Jetty

- (A9-1) All works are to be constructed in accordance with Appendix 1 – Map 2, titled “Proposed New Service Jetty and Hardstand – General Arrangement” dated 13/07/07.
- Drawings must be signed by the Registered Professional Engineer of Queensland who is responsible for the design of the works.
- A report from a Registered Professional Engineer of Queensland must be submitted to the Environmental Protection Agency within three (3) months of the date of completion of the works, certifying that:-
- (a) The works (including any other associated works) have been constructed in accordance with the approved drawings and these conditions;
 - (b) The works:- (i) are structurally adequate for anticipated usage; and (ii) comply with all relevant codes including the Environmental Protection Agency's operational policy, Building and engineering standards for tidal works; and
 - (c) The bed and banks of the waterway for a distance of 15 metres around the site of the works are clear of all debris.
- (A9-2) The administering authority may order the works to be removed or modified, within a reasonable time, if the works have or are likely to have a significant effect on coastal management because the works:
- (a) create a navigation hazard or other danger to the public; or
 - (b) cause erosion or land degradation; or
 - (c) are unstable or have not been constructed according to the approved plans.
- (A9-3) All reasonable and practicable measures must be taken to prevent pollution to adjacent waters as a result of silt run-off, oil and grease spills from machinery, concrete truck washout and alike. Concrete agitator wash out must only be conducted in a specified area to facilitate the removal of waste concrete from the area to landfill. Wastewater from cleaning equipment must not be discharged directly or in-directly to any watercourses or stormwater systems.
- (A9-4) You must remove any material that is deposited outside of the alignment of the works shown on the approved plans or any debris that falls or is deposited on tidal lands or into tidal waters during the construction of the works.
- (A9-5) No CCA treated timber is to be used until external surfaces are dry from the CCA treatment process. All treated timber is to be sawn or drilled over a catchment sheet and all offcuts are to be disposed of to an approved landfill site.

- (A9-6) You must:-
- (a) Ensure that the construction of the works are carried out only by means of suitable plant and equipment and that measures are taken to limit turbidity in tidal waters as a result of the construction.
 - (b) Ensure that the disturbance to the bed and banks of the waterway is kept to a minimum.
 - (c) Take all appropriate measures to minimise pollution of tidal waters as a result of silt runoff, and the discharge of other contaminants, such as fuel, oil and hydraulic fluid to the waterway during construction of the works.
 - (d) Assess the area with regards to the occurrence of acid sulphate soils, where any excavations are made in or adjacent to tidal land or waters. If these soils are found to be present, then action must be undertaken to minimise the impact these soils will have on the water quality of the waterway.

END OF CONDITIONS FOR SCHEDULE A

Schedule B - Air

Dust nuisance

- (B1-1) The release of dust or particulate matter or both resulting from the mining activity must not cause an environmental nuisance, at any sensitive place.

Odour nuisance

- (B2-1) The release of noxious or offensive odour(s) or any other noxious or offensive airborne contaminant(s) resulting from the mining activity must not cause an environmental nuisance at any sensitive place.

Point source release of contaminants to the atmosphere

- (B3-1) Contaminants must not be released to the atmosphere from a release point shown in Schedule B – Table 1 other than:
- (a) in accordance with the criteria shown in Schedule B – Table 1; and
 - (b) directed vertically upwards, with no impedence.

Schedule B – Table 1 (Release of contaminants)

Release Point	Contaminant released	Maximum mesh size
Incinerator on ML 2806	Ash only	≤1cm

Abrasive Blasting / Metal finishing

- (B4-1) Itinerant and/or open air abrasive blasting and / or metal finishing activities must be carried out in a dedicated area using temporary shrouding, screens, polythene sheeting or other methods to prevent the release of contaminants that may cause a nuisance at any nuisance sensitive or commercial place or contamination of surrounding areas.

Note: Refer to the Department of Employment Training and Industrial Relations – Workplace Health and Safety for any safety requirements that may apply to your specific operations.

- (B4-2) Unless an item is too large for containment in an enclosed booth or chamber, all fixed site abrasive blasting and/or metal finishing must be carried out within an enclosed booth or chamber that prevents the release of contaminants that may cause a nuisance at any nuisance sensitive or commercial place or contamination of surrounding areas

Note: Refer to the Department of Employment Training and Industrial Relations – Workplace Health and Safety for any safety requirements that may apply to your specific operations.

END OF CONDITIONS FOR SCHEDULE B

Schedule C - Water

Release to waters

- (C1-1) The release of contaminants to waters must only occur from the release points specified in Schedule C - Table 1 (Contaminant Release Points) and depicted in Schedule 1 - Map 1.

Schedule C - Table 1 (Contaminant Release Points)

Release Point	Easting (WGS 84)	Northing (WGS 84)	Contaminant Source, Location and Description of Release Point	Monitoring Point Description
SWL005	320507	8342294	Treated water from the processing mill and stormwater runoff from process plant and ore stockpile, releasing via water pump/s	Airport Lake release point

- (C1-2) Receiving waters affected by the release of process water or storm water contaminated by the mining activities or both must be monitored at the locations and frequencies specified in Schedule C – Table 2 (as depicted in Schedule 1 – Map 1), for each quality characteristic described in Schedule C – Table 3 (Receiving Water Trigger Levels) and Schedule C – Table 4 (Receiving Water Contaminant Limits).

Schedule C – Table 2 (Receiving water monitoring locations and frequency)

Monitoring point	Easting (WGS 84)	Northing (WGS 84)	Monitoring frequency
<u>Lakes/Wetlands</u>			
SWL001	318396	8341636	Monthly
SWL002	319972	8343430	Monthly
SWL005	320507	8342294	For routine monitoring of receiving waters if flowing: • Monthly During discharge: • Daily for first week • Where a discharge event has a duration exceeding one week, sampling should be undertaken weekly after week one until discharge ceases
<u>Reference Site¹</u>			
SWL003	321928	8342811	Monthly
SWL004	315932	8341660	Monthly

<u>Streams</u>			
SWS003	320775	8342249	For routine monitoring of receiving waters if flowing: • Monthly During discharge: • Daily for first week • Where a discharge event has a duration exceeding one week, sampling should be undertaken weekly after week one until discharge ceases
Reference Site¹			
SWS002	315246	8335059	Monthly

¹ Reference sites must:

- (a) be from the same biogeographic and climatic region; and
- (b) have similar geology, soil types and topography; and
- (c) contain a range of habitats similar to those at the test sites; and
- (d) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site.

Schedule C – Table 3 (Receiving Water Trigger Levels)

Parameter	Units	Trigger Level for lakes		Trigger Level for streams	Trigger Level Type
Chlorophyll α	$\mu\text{g/L}$	10 ³ or 80 th percentile ¹ of reference site ² whichever is higher		10 ³ or 80 th percentile ¹ of reference site ² whichever is higher	Mean ⁵
pH	Units	4.0 ⁶ or 20 th percentile ¹ of reference site ² whichever is lower		4.0 ⁶ or 20 th percentile ¹ of reference site ² whichever is lower	Mean ⁵
		8.0 ⁶ or 80 th percentile ¹ of reference site ² whichever is higher.		8.0 ⁶ or 80 th percentile ¹ of reference site ² whichever is higher	
Total Petroleum Hydrocarbons ⁷	$\mu\text{g/L}$	C6-C9	20 ⁹	N/A	95 th percentile ⁵
		C10-C14	50 ⁹		
		C15-C28	100 ⁹		
		C29-C36	50 ⁹		
Turbidity	NTU	22 ⁸ or 80 th percentile ¹ of reference ² whichever is higher		15 ³ or 80 th percentile ¹ of reference ² whichever is higher	Mean ⁵
Dissolved Oxygen	%	90% ³ or 20 th percentile ¹ of reference site ² whichever is lower		85% ³ or 20 th percentile ¹ of reference site ² whichever is lower	Mean ⁵
		120% ³ or 80 th percentile ¹ of reference site ² whichever is higher		120% ³ or 80 th percentile ¹ of reference site ² whichever is higher	

¹ Trigger value based on the 80th or 20th percentile are derived using ANZECC (2000) methodology.

² Reference sites as defined in Schedule C – Table 2 .

³ ANZECC (2000) trigger levels for aquatic ecosystems slightly – moderately disturbed systems – Table 3.4.1 95% level of protection or Table 3.3.4 / 3.3.5 - tropical Australian low rivers and fresh water lakes & wetlands.

⁵ The mean and the 95th percentile must be determined based on no more than ten (10) consecutive samples.

⁶ The values for pH in unimpacted lake and stream waters at CFSM are naturally in excess of ANZECC (2000) trigger levels in aquatic ecosystems for slightly disturbed systems – table 3.3.4. The minimum trigger value here is derived from the CFSM EMOS (1994). The minimum values are within the range recorded for reference sites - lake (SWL004), and stream (SWS002) between October 1996 and November 2002.

⁷ TPH will only be analysed for in lake waters (SWL002) and (SWL001).

⁸ The turbidity values in some unimpacted lake waters at CFSM are in excess of the lower ANZECC (2000) trigger levels for aquatic ecosystems of slightly disturbed systems – table 3.3.5. The trigger value here represents the 80th percentile value for control SWL003 calculated from 22 data points generated between October 1997 and November 2002.

⁹ Value based on the Limit of Detection attainable by NATA accredited analytical laboratories.

Schedule C – Table 4 (Receiving Water Contaminant Limits)

Parameter	Units	Limit	Limit Type
pH	Units	3.8 ¹ or 0.5 unit less than the value recorded at a reference site ³ during the same sampling event, whichever is lower	Minimum
		8.5 ² or 0.5 unit more than the highest value recorded at a reference site ³ during the same sampling event, whichever is higher	Maximum
Turbidity	NTU	95 ⁴ or 10% more than the value recorded at the reference site ³ during the same sampling event, whichever is higher	Maximum
Chlorophyll α	$\mu\text{g/L}$	83 ⁵ or 10% more than the value recorded at the reference site ³ during the same sampling event, whichever is higher	Maximum
TPH	NA	Oil and petrochemicals should not be noticeable as a visible film on the water nor should they be detectable by odour ²	Maximum

¹ Value based on lowest pH recorded at reference site SWL004 in Schedule C – Table 2.

² Value based on Recreational waters ANZECC (2000) Guidelines for Recreational Water Quality and Aesthetics.

³ Reference sites as defined in Schedule C Table 2.

⁴ Value based on the highest turbidity recorded at reference site SWL003 in Schedule C – Table 2.

⁵ Value based on highest Chlorophyll α recorded at reference site SWL004 in Schedule C – Table 2.

(C1-3) Subject to Condition (C1-2), if the surface water trigger levels defined in Schedule C – Table 3 are exceeded then the environmental authority holder must complete an investigation into the potential for environmental harm and notify the administering authority within 3 months of receiving the analysis result.

(C1-4) Subject to Condition (C1-2), Schedule C – Table 2, surface water quality parameters must not exceed the contaminant limits defined in Schedule C – Table 4.

Erosion and sediment control

(C2-1) All reasonable and practicable erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment.

Sewage effluent

(C3-1) All effluent released from the treatment plant must be monitored at the frequency and for the parameters specified in Schedule C – Table 5.

Schedule C – Table 5 (Sewage effluent quality targets and monitoring frequency)

Quality characteristics	Units	Limit	Limit Type	Monitoring frequency
pH	Units	6 8.5	Minimum Maximum	Weekly
Dissolved Oxygen	mg/L	≥ 2.0	80 th percentile ¹	Weekly
Total Suspended Solids (TSS)	mg/L	≤ 30	80 th percentile ¹	Monthly
Free chlorine residual (Cl ₂)	mg/l	≤ 0.7	Maximum	Weekly

¹ The 80th percentile must be determined based on no more than ten (10) consecutive samples.

- (C3-2) Subject to Condition (C3-1), release of final effluent is permitted via a subsurface trench located at point x (Appendix 1 – Map 1: Water Monitoring Locations). Alternatively, such effluent can be used for dust suppression, irrigation or the process circuit.

Groundwater

- (C4-1) Groundwater, affected by the mining activities must be monitored for the stated parameters at the locations and frequencies defined in Schedule C – Table 6, as shown in Appendix 1 – Map 1.

Schedule C – Table 6 (Groundwater monitoring locations and frequency)

Monitoring point	Easting (WGS 84)	Northing (WGS 84)	Parameters	Monitoring frequency
GW003 (Down gradient of STP)	317331	8345071	TON, TN, FRP, TP only	Monthly
GW004 (Bioremediation pad)	318517	8344368	TPH	Monthly
GW005 (Stores - refuelling area)	318678	8344270	TPH	Monthly
GW006 (Powerhouse - refuelling area 1)	320044	8343611	TPH	Monthly
GW007 (Powerhouse - refuelling area 2)	320084	8343590	TPH	Monthly
GW008 (Fuel Farm 1)	318360	8345310	TPH	Monthly
GW009 (Fuel Farm 2)	318357	8345332	TPH	Monthly
GW010 (Down gradient of landfill)	318373	8344985	pH, EC, Manganese, Ammonia, Chloride, Lead	Monthly
GW013 (Down gradient of the Mine Rejects Area)	315142	8341422	pH, EC, Ammonia, , TP	Monthly
GW014 (Down gradient of the New Mill)	316349	8340498	pH, EC, Ammonia, , TP	Monthly
GW015 (Down gradient of the New Mill Process Pond)	316208	8340030	pH, EC, Ammonia, , TP	Monthly
Reference Site ¹				

GW001	320786	8342422	TPH, Lead, TON, TN, FRP, TP, pH, EC, Ammonia, Chloride, Manganese, Lead	Monthly
GW002	319042	8340652	TPH, Lead, TON, TN, FRP, TP, pH, EC, Ammonia, Chloride, Manganese, Lead	Monthly

¹ Reference sites must:

- a) be from the same biogeographic and climatic region; and
- b) have similar geology, soil types and topography; and
- c) contain a range of habitats similar to those at the test sites; and
- d) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site

Schedule C – Table 7 (Groundwater contaminant trigger levels)

Parameter		Units	Contaminant trigger levels	Limit type
Total Oxidised Nitrogen		mg/L	0.01 ³ or 80 th percentile ¹ of reference site ² whichever is higher	Mean ⁴
Total Nitrogen		mg/L	No trigger value (refer to Table 8)	N/A
Filterable Reactive Phosphorus (orthophosphate)		mg/L	0.01 ⁵ or 80 th percentile ¹ of reference site ² whichever is higher	Mean ⁴
Total Phosphorus		mg/L	No trigger value (refer to Table 8)	N/A
Total Petroleum Hydrocarbons	C6-C9	µg/L	20 ⁵	95 th percentile ⁴
	C10-C14	µg/L	50 ⁵	
	C15-C28	µg/L	100 ⁵	
	C29-C36	µg/L	50 ⁵	
Manganese		µg/L	1900 ³ or 80 th percentile ¹ of reference site ² whichever is higher	95 th percentile ⁴
Chloride		µg/L	80 th percentile ¹ of reference site ²	95 th percentile ⁴
Ammonia		µg/L	900 ³ or 80 th percentile ¹ of reference site ² whichever is higher	95 th percentile ⁴
Lead		µg/L	3.4 ³ or 80 th percentile ¹ of reference site ² whichever is higher	95 th percentile ⁴
Conductivity		µScm ⁻¹	250 ³ or 80 th percentile ¹ of reference site ² whichever is higher	Mean ⁴
pH		Units	4.0 ⁶ or 20 th percentile ¹ of reference site ² whichever is lower	Mean ⁴
			8.0 ³ or 80 th percentile ¹ of reference site ² whichever is higher	

¹ Trigger levels based on the 80th percentile or 20th percentile are derived using ANZECC (2000) methodology.

² Reference sites defined in Schedule C – Table 6.

³ ANZECC (2000) trigger levels for slightly – moderately disturbed aquatic ecosystems – table 3.4.1 (trigger values for toxicants in freshwater) level of protection 95% or table 3.3.4 / 3.3.5 - tropical Australian lowland rivers and fresh water lakes & wetlands.

⁴ The mean and the 95th percentile must be determined based on no more than ten (10) consecutive samples.

⁵ Value based on the Limit of Detection attainable by NATA accredited analytical laboratories.

⁶ The values for pH in unimpacted lake and stream waters at CFSM are naturally in excess of ANZECC (2000) trigger levels in aquatic ecosystems for slightly disturbed systems – table 3.3.4. The trigger value for pH was developed through negotiation with CFSM and based upon local monitoring data.

- (C4-2) Subject to Condition (C4-1), if the groundwater contaminant trigger levels defined in Schedule C – Table 7 are exceeded then the environmental authority holder must complete an investigation into the potential for environmental harm and notify the administering authority within 3 months of receiving the analysis results.
- (C4-3) Subject to Condition (C4-1), groundwater quality parameters must not exceed the contaminant limits defined in Schedule C – Table 8.

Schedule C – Table 8 (Groundwater contaminant limits)

Parameter	Units	Contaminant limit	Limit type
Total nitrogen	mg/L	4 ¹ or no more than 10% higher than the value recorded at the reference site ² during the same sampling event, whichever is higher	Maximum
Total phosphorus	mg/L	1 ¹ or no more than 10% higher than the value recorded at the reference site ² during the same sampling event, whichever is higher	Maximum
Lead	mg/L	0.01 ³ or no more than 10% higher than the value recorded at the reference site ² during the same sampling event, whichever is higher	Maximum
Ammonia	mg/L	1 ¹ or no more than 10% higher than the value recorded at the reference site ² during the same sampling event, whichever is higher	Maximum
Total Petroleum Hydrocarbons	µg/L	No more than 10% higher than the value recorded at the reference site ² during the same sampling event.	Maximum

¹ Based on CFSM EMOS (1994), GBRMPA Policy Paper 9 (1993) and Tertiary Treatment Standards

² Reference sites as defined in Schedule C – Table 6

³ Based on ANZECC (2000) drinking water quality guidelines

- (C4-4) The method of water sampling required by this environmental authority must comply with that set out in the latest edition of the Department of Environment and Resource Management's Water Quality Sampling Manual.

END OF CONDITIONS FOR SCHEDULE C

Schedule D - Noise and Vibration

Noise nuisance

- (D1-1) Noise from the mining activity must not cause an environmental nuisance, at any sensitive or commercial place.

Vibration nuisance

- (D2-1) Vibration from the mining activity must not cause an environmental nuisance, at any sensitive place.

END OF CONDITIONS FOR SCHEDULE D

Schedule E - Waste

Storage of tyres

- (E1-1) Tyres stored awaiting disposal or transport for take-back and, recycling, or waste-to-energy options - should be stockpiled in volumes less than 3m in height and 200 sq.m in area and at least 10m from any other tyre storage area.
- (E1-2) All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10m radius of the scrap tyre storage area.

Off Site Movement of Regulated Wastes

- (E4-1) Where regulated waste is removed from the licensed place (other than by a release as permitted under another schedule of this environmental authority), the holder of this environmental authority must ensure that:
- (a) the removal and transport of such wastes, where it constitutes an environmentally relevant activity under the *Environmental Protection Regulation 1998*, is carried out by a person licensed for carrying out this activity under the *Environmental Protection Act 1994*; and
 - (b) records are kept of the following:
 - (i) the date, quantity and type of waste removed; and
 - (ii) name of the regulated waste transporter that removed the waste; and
 - (iii) the intended treatment/disposal destination of the waste.

Note: Records of documents maintained in compliance with a waste tracking system established under the *Environmental Protection Act 1994* or any other law for regulated waste will be deemed to satisfy this environmental authority condition.

- (E4-2) Regulated waste generated by maintenance of plant and equipment and absorbent materials used to clean up spills must be either disposed of at a facility whose operator is permitted to accept such waste in accordance with the requirements of the *Environmental Protection Act 1994* or be treated on site in a designated bioremediation area. Treated material will not be used for any purpose unless contamination thresholds defined in Schedule E - Table 13 are achieved.

Schedule E – Table 13: TPH Thresholds in Treated Soils

Recoverable Hydrocarbon Fraction	Maximum ¹
C6-C9	100 mg/kg
C10-14	100 mg/kg
C15 and greater	1000 mg/kg

¹ Guidelines for Assessment of Contaminated Land in Qld. 1991.

END OF CONDITIONS FOR SCHEDULE E

Schedule F - Land

Rehabilitation landform criteria

- (F1-1) All areas significantly disturbed by mining activities must not exceed the maximum surface area as defined in Schedule F – Table 1 and Appendix 1 – Figure 3.
- (F1-2) All areas significantly disturbed by mining activities must be rehabilitated to the post-mine land description as defined in Schedule F – Table 1.

Schedule F – Table 1 (Final Land Use and Rehabilitation)

Tenure ID	Disturbance category	Disturbance type	Maximum surface area (ha)	Post-mine land description	Rehabilitation completion criteria
ML2806 ML2965 ML40048 ML7069	Township	Township	9	Conservation ²	Refer to Condition (F2-1)
		Old offices, workshop and store	4	Hopevale Owner Use ¹	
	Infrastructure	Workshops, store and offices	1	Hopevale Owner Use ¹	
		Airstrip	8	Hopevale Owner Use ¹	
		Main fuel farm	1	Hopevale Owner Use ¹	
		Landfill	1	Native grass ³	
		Supply wharf area	3	Hopevale Owner Use ¹	
		STP	1	Hopevale Owner Use ¹	
		Water supply	1	Hopevale Owner Use ¹	
		Communications	1	Hopevale Owner Use ¹	
	Treatment Plant	Treatment Plant (new), Process pond and new mill infrastructure not to be retained	4	Conservation ²	
		Treatment plant (incl. water pump, nursery, pipe shed, laydown areas)		Hopevale Owner Use ¹	
		Power house and fuel storage	1	Hopevale Owner Use ¹	
		Stockpile and mill outwash	42	Conservation ²	
	Access	Mining access roads to be retained, Township access roads, fuel line and powerlines	72	Hopevale Owner Use ¹	

Tenure ID	Disturbance category	Disturbance type	Maximum surface area (ha)	Post-mine land description	Rehabilitation completion criteria
		Mining access roads, powerlines and water transport system	52	Conservation ²	
	Dams and Diversions	Water Diversions	11	Hopevale Owner Use ¹	
		Arnie's Dam	10	Hopevale Owner Use ¹	
	Quarries and Borrow Pits	Quarry (incl. borrow pits)	7	Conservation ²	
	Active mining ⁴ , Non-active Mining ⁵ and Mobile Infrastructure ⁶	Current and Planned future Active Mining, Non-active Mining and Mobile Infrastructure	1,570	Conservation ²	
	Exploration ⁷		10	Conservation ²	

1. Special Covenants and conditions (Schedule 3.13) apply to ML 2806 and require that "capital installations not of a demountable nature revert to the Department of Aboriginal and Island Affairs(sic) for the sole use and benefit of assisted residents of the reserve areas." Capital installations have been interpreted as township, wharves, power station, fuel lines and storage, airstrip, offices and workshops. It has been assumed that mining infrastructure such as treatment plant and reclaimer would need to be removed on surrender of the lease.
2. Conservation land use has been nominated for areas not identified by Hope Vale Owners for alternative uses. Prior to lease surrender Hope Vale Owners may nominate suitable post mining landuses (for example, retention of some roads or development of horticulture areas). Where alternative uses are agreed between CFSM and Hope Vale Owners these land uses will be adopted.
3. Native grasses must be used on the capped landfill as per the requirements of the approved Decommissioning Plan.
4. **Active mining** includes land:
 - a. that is cleared of vegetation, stripped of topsoil, and where sand is being extracted for processing
 - b. that is an active rejects area.
 The upper limit for active mining at any one time is 150 ha
5. **Non-active mining** includes disturbed land that is not active mining, mobile infrastructure or exploration.
6. **Mobile infrastructure** includes:
 - a. infrastructure that can be relocated from one position to another
 - b. land area associated with access tracks, conveyors, pipelines, slurry lines, power lines, transfer stations and mill infrastructure.
 The upper limit for the disturbance area occupied by mobile infrastructure at any one time is 125 ha.
7. Exploration can be undertaken within the Mining Lease areas to a maximum of 10 ha at any one time in accordance with Condition A7-1.

(F1-3) Progressive rehabilitation must commence when areas become available within the operational land.

Rehabilitation completion criteria

(F2-1) Land disturbed by mining must be rehabilitated in accordance with **Schedule F -Table 2a** and **Schedule F – Table 2b**.

(F2-2) By 1 November 2021 and every two years thereafter, the holder of this environmental authority must submit a rehabilitation monitoring report to the administering authority.

- (F2-3) The rehabilitation monitoring report referred to in (F2-2) must clearly demonstrate rehabilitation progress in accordance with rehabilitation objectives, indicators and completion criteria as detailed in **Schedule F - Table 2a** and **Schedule F - Table 2b** for each **rehabilitation area** in accordance with the post-mine land use descriptions. The report must include but not be limited to the following:
- (a) details of monitoring, reporting and review for each completion criterion;
 - (b) a description of methodologies and standards, including the results from field-based assessments and the application of Geographic Information Systems and other relevant emerging technologies;
 - (c) an analysis of site data including multi-year comparison trends;
 - (d) the presentation of relevant statistically valid data;
 - (e) maps and figures illustrating the mine disturbance, all existing infrastructure including that infrastructure which is to remain for the landholder;
 - (f) details with regards to any potential contamination, notifiable activities, site management plans, remediation; and
 - (g) contingency strategies if monitoring data indicates completion criteria are unlikely to be met.

Infrastructure

- (F3-1) All infrastructure, constructed by or for the environmental authority holder during the mining activities including water storage structures, must be removed from the site prior to mining lease surrender, except where agreed in writing by the post mining land owner / holder.

Schedule F - Table 2a (Land rehabilitation completion criteria for the attainment of the goals: safe, stable, does not cause environmental harm, and is able to sustain the post-mining land use)

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
Hope Vale Owner Use	Township (excluding landfill) and Infrastructure	- Township - Old offices, workshop and store - Quarry (current sand blasting area and pad) - New workshops, store and offices - Supply wharf area - Communications	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	- All infrastructure/ assets not stipulated in a landholder statement as being retained are removed. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			Contamination associated with notifiable activities identified, risk to human or ecological receptors in terrestrial or aquatic environments assessed and remediation carried out or site management plan approved and implemented.	Soil and water quality with respect to contaminants.	- Site Investigation Report: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>. - Site removed from Contaminated Land Register by the registrar; or - Site Management Plan: - prepared and certified by an appropriately qualified person and - approved in accordance with the <i>Environmental Protection Act 1994 and</i> - includes a statement by the underlying landholder accepting responsibility to implement the Site Management Plan.

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
			Stormwater managed to minimise likelihood of environmental values in the receiving environment being diminished.	Condition of all designated erosion and sediment control structures (ESCSs) in the domains.	- Within 2 months prior to relinquishment, all retained ESCSs are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Agreement reached with Traditional Owners on transfer of infrastructure/ assets to maintain existing land use.	Existence of landholder statement to cover infrastructure/ assets.	Landholder statement in place to cover infrastructure/ assets.
Hope Vale Owner Use	Access	Township access roads, fuel line and power lines	- Access roads maintained at transfer. - Fuel and power lines in serviceable condition. - All signage and safety devices retained in place and maintained.	- Road condition. - Fuel line and power line condition. - Presence of signage.	- Within 2 months prior to relinquishment, all retained township access roads, fuel and power lines are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Contamination associated with notifiable activities identified, risk to human or ecological receptors in terrestrial or aquatic environments assessed and remediation carried out or site management plan established.	Soil and water quality with respect to contaminants.	- Site Investigation Report: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>. - Site removed from Contaminated Land Register by the registrar; or - Site Management Plan: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>; and - includes a statement by the underlying landholder accepting responsibility to implement the Site Management Plan.

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
			Stormwater managed to minimise likelihood of environmental values in the receiving environment being diminished.	Condition of all designated erosion and sediment control structures (ESCSs).	- Within 2 months prior to relinquishment, all retained ESCSs are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Agreement reached with Traditional Owners on transfer of infrastructure/ assets to maintain existing land use.	Existence of landholder statement to cover infrastructure/ assets.	- Landholder statement in place to cover infrastructure/ assets. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
		Mining access tracks to be retained	Minor tracks to be retained will remain open and usable at relinquishment.	Track condition.	- Within 2 months prior to relinquishment, all retained tracks are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Agreement reached with Traditional Owners on transfer of infrastructure/ assets to maintain existing land use.	Existence of landholder statement to cover infrastructure/ assets.	- Landholder statement in place to cover infrastructure/ assets. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
	Infrastructure	Airstrip and associated infrastructure/ assets	- Airstrip and fuel storage meet relevant standards and are maintained at transfer. - All signage and safety devices retained in place and maintained.	- Airstrip condition. - Fuel storage condition. - Presence of signage.	- Within 2 months prior to relinquishment, the airstrip and fuel storage area is certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
			Agreement reached with Traditional Owners on transfer of infrastructure/ assets to maintain existing land use.	Existence of landholder statement to cover infrastructure/ assets.	- Landholder statement in place to cover infrastructure/ assets. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
Hope Vale Owner Use	Infrastructure and Treatment Plant	- Main fuel farm - Sewage Treatment Plant (STP) - Water supply - Powerhouse and fuel storage - Water pump, nursery, pipe shed, filter belt pad and laydown areas	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	- All infrastructure/ assets not stipulated in a landholder statement as being retained are removed. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			All equipment and assets meet relevant standards and/or performance is in compliance with the conditions of this environmental authority.	Environmental compliance.	- Within 2 months prior to relinquishment, all retained infrastructure/ assets associated with the main fuel farm; sewage treatment plant (STP); water supply; powerhouse and fuel storage; water pump, nursery, pipe shed, filter belt pad and laydown areas are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Contamination associated with notifiable activities identified, risk to human or ecological receptors in terrestrial or aquatic environments assessed and remediation carried out or site management plan established.	Soil and water quality with respect to contaminants.	- Site Investigation Report: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>. - Site removed from Contaminated Land Register by the registrar; or - Site Management Plan: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>; and

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
					includes a statement by the underlying landholder accepting responsibility to implement the Site Management Plan.
			Stormwater managed to minimise likelihood of environmental values in the receiving environment being diminished.	Condition of all designated erosion and sediment control structures (ESCSs) in the domains.	- Within 2 months prior to relinquishment, all retained ESCSs are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Agreement reached with Traditional Owners on transfer of infrastructure/ assets to maintain existing land use.	Existence of landholder statement to cover infrastructure/ assets.	Landholder statement in place to cover these infrastructure/ assets.
	Dams and Diversions	Arnie's Dam	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	- All infrastructure/ assets not stipulated in a landholder statement as being retained are removed. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			All equipment and infrastructure/ assets meet relevant standards and/or performance as required by existing approvals (such as Water Licences).	Regulatory compliance.	- Within 2 months prior to relinquishment, all retained Dams and Diversions are certified by an appropriately qualified person: - as being fit for purpose; and - meet the requirements of its intended final use.

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
			Releases or run-off to the surface water receiving environment does not diminish environmental values in the receiving environment.	Water quality.	Within 2 months of relinquishment, a site investigation report is prepared by appropriately qualified person that verifies that Arnie's Dam: - meets the relevant water quality parameter requirements in this environmental authority; and - meets the requirements of its intended final use.
			Agreement reached with Traditional Owners on transfer of infrastructure/ assets to maintain existing land use.	Existence of landholder statement to cover infrastructure/ assets.	- Landholder statement in place to cover these infrastructure/ assets. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
	Dams and Diversions	Water diversions	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	- All infrastructure/ assets that is not stipulated in a landholder statement as being retained is removed. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			The channels will be open and functional with no signs of active erosion that could compromise functionality.	Condition of channels.	- Within 2 months prior to relinquishment, all retained ESCs are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm. - Within 2 months prior to relinquishment, all retained water diversions and channels are certified by an appropriately qualified person as: - being in a fit for purpose; and

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
Native Grass	Township	Landfill			causing no environmental harm.
			Agreement reached with Traditional Owners on transfer of assets to maintain existing land use.	Existence of landholder statement to cover infrastructure/ assets.	Landholder statement in place to cover these infrastructure/ assets.
			All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	All infrastructure/ assets not stipulated in a landholder statement as being retained are removed.
			Decommissioned according to a plan prepared by an appropriately qualified person.	Decommissioning Plan existence and implemented.	- Decommissioning Plan prepared by an appropriately qualified person and implemented as approved by the administering authority. - Native grass present in revegetation of the landfill.
			Stormwater managed to minimise erosion and the likelihood of environmental values in the receiving environment being diminished.	Condition of all designated erosion and sediment control structures (ESCSs) in the domains.	- Within 2 months prior to relinquishment, all retained ESCSs are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Seepage water quality does not present a risk of impacting the environmental values of the local aquifer.	Soil and water quality.	- Site Investigation Report: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>. - Site removed from Contaminated Land Register by the registrar; or - Site Management Plan: - prepared and certified by an appropriately qualified person; and

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
					- o approved in accordance with the <i>Environmental Protection Act 1994</i>; and - o includes a statement by the underlying landholder accepting responsibility to implement the Site Management Plan.
Conservation Use	Treatment plant (old)	Stockpile and mill outwash	• All infrastructure/ assets not listed in Appendix 2 Table H are removed.	• Presence of unwanted infrastructure/ assets.	• All infrastructure/ assets not stipulated in a landholder statement as being retained are removed. • All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			• Contamination associated with notifiable activities identified, risk to human or ecological receptors in terrestrial or aquatic environments assessed and remediation carried out or site management plan established.	• Soil and water quality with respect to contaminants.	• Site Investigation Report: - o prepared and certified by an appropriately qualified person; and - o approved in accordance with the <i>Environmental Protection Act 1994</i>. • Site removed from Contaminated Land Register by the registrar; or • Site Management Plan: - o prepared and certified by an appropriately qualified person; and - o approved in accordance with the <i>Environmental Protection Act 1994</i>; and - o includes a statement by the underlying landholder accepting responsibility to implement the Site Management Plan.
			• Refer to rehabilitation objectives (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F - Table 2b.	• Refer to rehabilitation indicators (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F - Table 2b.	• Refer to rehabilitation completion criteria (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F - Table 2b.
	Access		• All infrastructure/ assets not listed in Appendix 2 Table H are removed.	• Presence of unwanted infrastructure/ assets.	• All infrastructure/ assets not stipulated in a landholder statement as being retained are removed.

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
		Mining access roads, power lines, sand and water transport systems not to be retained			All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			Refer to rehabilitation objectives (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F – Table 2b.	Refer to rehabilitation indicators (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F – Table 2b.	Refer to rehabilitation completion criteria (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F – Table 2b.
	Treatment plant (new)	Process pond and new mill infrastructure not to be retained	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	- All infrastructure/ assets not stipulated a landholder statement as being retained are removed. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			Contamination associated with notifiable activities identified, risk to human or ecological receptors in terrestrial or aquatic environments assessed and remediation carried out or site management plan established.	Soil and water quality with respect to contaminants.	- Site Investigation Report: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>. - Site removed from Contaminated Land Register by the registrar; or - Site Management Plan: - prepared and certified by an appropriately qualified person; and - approved in accordance with the <i>Environmental Protection Act 1994</i>; and - includes a statement by the underlying landholder accepting responsibility to implement the Site Management Plan.
			Refer to rehabilitation objectives (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F – Table 2b.	Refer to rehabilitation indicators (Treatment Plant (old), Access and Treatment Plant (new)) in Schedule F – Table 2b.	Refer to rehabilitation completion criteria (Treatment Plant (old), Access and Treatment Plant (new)) in Table 2b.

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
	Quarries	Quarry areas at headlands including abandoned fuel storage area above the township	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	- All infrastructure/ assets not stipulated in a landholder statement as being retained are removed. - All areas where infrastructure/ assets have been removed have been rehabilitated to meet the completion criteria for Conservation Use as prescribed in Schedule F - Table 2b.
			Quarries decommissioned according to a plan developed within 36 months of closure prepared by an appropriately qualified professional.	Quarries Decommissioning Plan existence.	An appropriately qualified person has certified that the quarry area has been decommissioned in accordance with an approved Quarries Decommissioning Plan that has been agreed to in writing by the administering authority.
			Geotechnical stability is assessed as part of the preparation of the Quarries Decommissioning Plan and works implemented to provide acceptable geotechnical stability.	Geotechnical stability.	Within six months prior to relinquishment, a geotechnical assessment has been undertaken by an appropriately qualified person to certify that the quarry area is geotechnically stable and meets relevant standards.
			Stormwater managed to minimise erosion and the likelihood of environmental values in the receiving environment being diminished.	Condition of all designated erosion and sediment control structures (ESCSs) in the domain.	- Within 2 months prior to relinquishment, all retained ESCSs are certified by an appropriately qualified person as: - being fit for purpose; and - causing no environmental harm.
			Rehabilitation objectives to be developed as part of the Quarries Decommissioning Plan.	Rehabilitation indicators to be nominated in the Quarries Decommissioning Plan.	Rehabilitation completion criteria to be nominated in the approved Quarries Decommissioning Plan.

Post-mining land use description	Disturbance category	Disturbance type	Rehabilitation objectives	Indicators	Completion criteria
	Borrow pits	Borrow pits (red sand) in mining areas or adjacent to haul roads	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	All infrastructure/ assets not stipulated in a landholder statement as being retained are removed.
			Refer to rehabilitation objectives (Borrow Pits, Non-active mining, Active Mining) in Schedule F - Table 2b.	Refer to rehabilitation indicators (Borrow Pits, Non-active mining, Active Mining) in Schedule F – Table 2b.	Refer to rehabilitation completion criteria (Borrow Pits, Non-active mining, Active Mining) in Schedule F – Table 2b.
Conservation Use	Non-Active Mining Active Mining	All areas disturbed directly by sand mining (sand removal and/or rejects replacement) including mining under rehabilitation, current mining or waiting commencement of rehabilitation.	All infrastructure/ assets not listed in Appendix 2 Table H are removed.	Presence of unwanted infrastructure/ assets.	All infrastructure/ assets not stipulated in a landholder statement as being retained are removed.
			Refer to rehabilitation objectives (Borrow Pits, Non-active mining, Active Mining) in Schedule F – Table 2b.	Refer to rehabilitation indicators (Borrow Pits, Non-active mining, Active Mining) in Schedule F – Table 2b.	Refer to rehabilitation completion criteria (Borrow Pits, Non-active mining, Active Mining) in Schedule F - Table 2b.

Schedule F - Table 2b (Land rehabilitation completion criteria for the attainment of the goals: safe, stable, does not cause environmental harm, and is able to sustain the post-mining land use)

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
Conservation Use ¹	- Borrow pits - Non-active Mining - Active Mining	Borrow pits (red sand) in mining areas or adjacent to haul roads All areas disturbed directly by sand mining (sand removal and/or rejects replacement) including mining under rehabilitation, current mining or awaiting commencement of rehabilitation.	Socio-economic	Conservation Use is confirmed by TOs as the preferred post-mining land use prior to relinquishment ¹ .	Documentation.	Documented confirmation exists that Conservation Use remains the preferred post-mining land use prior to relinquishment.
				Rehabilitation to include plants recognised by TOs as important food plants or those having the potential for commercial exploitation by TOs (referred to generally as 'special use plants') ⁵ through inclusion of planting material in revegetation works.	Species composition.	Two or more (≥2) special use plants (Appendix 2 Table A)⁵ are recorded in each rehabilitation domain.
			Landscape context ¹⁹	Mining on the project area will not result in the loss of a rare or significant landform type ⁶ in the Cape Flattery Dunefield.	Land occupied by a rare or significant landform type⁶ disturbed by mining on the project area.	No loss of a rare or significant landform type (Appendix 2 Table B)⁶ in the Cape Flattery Dunefield as a result of mining on the project area.
				Rehabilitated landforms will contain complexity at different scales that is characteristic of the surrounding un-mined dunefield landform.	Landform element⁷ richness per rehabilitation area.	Each rehabilitation area will contain no less than 4 different landform elements (Appendix 2 Table C)⁷. [Rehabilitation area scale complexity.]
					Landform element⁷ richness per rehabilitation area. Landform element⁷ richness per nominal 4 ha grid cell in un-mined areas.	Within each rehabilitation domain, the median landform element⁷ richness per rehabilitation area will be greater than or equal to eight landform elements (≥8). [Rehabilitation domain scale complexity.]

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
					• Landform element⁷ richness per rehabilitation area. • Landform element⁷ richness per nominal 4 ha grid cell in un-mined areas.	• The range in landform element⁷ richness per rehabilitation area, across all rehabilitation domains available for assessment, will fall within the range of 3 to 47 landform elements. [Dunefield scale complexity.]
				Rehabilitated landforms will contain a range of landform elements that are common to and characteristic of the surrounding un-mined dunefield.	• Proportion of land area in each rehabilitation domain occupied by the 30 landform elements⁸ common to all dunefield landforms in un-mined areas. • Proportion of land area in each rehabilitation domain occupied by the 24 landform elements that account for 95% of the un-mined dunefield land area⁹.	• The land area of each rehabilitation domain occupied by any of the 30 common landform elements⁸ will be greater than or equal to 80% or • The land area of each rehabilitation domain occupied by any of the 24 landform elements that account for 95% of the un-mined dunefield land area⁹ will be greater than or equal to 75%.
					• The proportion of land occupied by each landform element in each rehabilitation domain. • The proportion of land occupied by each landform element in each dunefield landform type potentially affected by mining¹⁰.	• For at least one dunefield landform type, the average difference (all differences treated as positive values) between the proportion of land area occupied by each landform element in a rehabilitation domain compared to the proportion of land area occupied by the same landform element provided in Appendix 2 Table D¹⁰ is equal to or less than 1.5 %

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
					Proportion of land area in each rehabilitation domain occupied by landform elements with northeast and southwest facing aspects.	Northeast and southwest facing landform elements will dominate and occupy greater than or equal to 60% of the land area in each rehabilitated domain.
			Structure/ species composition	The rehabilitation strategy shall maximise the likely return of native plant species represented in the un-mined Cape Flattery Dunefield.	Documentation of topsoil, trash and/or brushmatting placement¹¹.	Propagules are returned to rehabilitated areas in the form of applied stored/direct placed topsoil, trash or brushmatting¹¹.
				Declared pest plants ² are being managed to minimise their threat to the surrounding landscape.	- Documentation of weed management. - Presence and proportion of declared pest plant² species.	- A Weed Management Plan is implemented to minimise the weed burden on lease areas and the risk of infestation in rehabilitated areas. - No declared pest plants² are recorded in the rehabilitation domain; or - The proportion of declared pest plant species relative to reference conditions is not increasing².
				Fauna recolonisation from the surrounding landscape is promoted through the provision of vegetation community structure in dominant landform groups in rehabilitation domains ¹² similar to the landform groups in the surrounding ecosystem.	Vegetation structure.	Crown class⁴ equivalent to, or crown cover (%) progressing towards, that of surrounding undisturbed vegetation community⁴ on dominant landform-groups in rehabilitation domains¹².

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
			Ecosystem function	Plant functional group richness on dominant landform groups in rehabilitation domains ¹² similar to or greater than the surrounding landscape.	- Species composition. Plant functional group richness.	- At least 70% of the plant functional groups¹³ present in reference sites (on equivalent landform groups) are represented in the rehabilitation domains¹⁴ or - In areas of standing water or regular periodic inundation, characterised by the accumulation of organic detritus in depressions, at least two species of flora wetland indicator species¹⁵ are present.
				The rehabilitation shows active recruitment of species from the surrounding landscape (a normal function of a recovering ecosystem).	- Species composition. - Documentation of seed mix or tubestock planting applied¹⁶. - Evidence of flowering and reproduction.	- Native species that are not in the original revegetation broadcast seed or planted tubestock species mix¹⁶ are present in each landform group within each rehabilitation domain; and - At least 3 native species¹⁷ are reproductively mature (flowering or seeding); and - At least 3 native species have at least 1 seedling or sapling¹⁷.
			Ecosystem stability / resilience	Vegetation community resilient to periodic stress (drought, cyclone or fire nominated as the stresses likely to affect rehabilitation outcomes).	- Annual rainfall (as an indicator of drought). - Fire events. - Tropical cyclones. - Plant functional group richness	- All other rehabilitation criteria have been met and the rehabilitation domain has at some point since seeding or final surface preparation experienced either: - at least one year with annual rainfall in the first decile range; or - at least one fire event covering > 50% of the rehabilitation domain; or - at least one severe tropical cyclone (Category 3 or greater); or - if the rehabilitation domain has never experienced one of the stress events (<i>i.e.</i> i, ii, or iii), then at least 80% of the plant functional groups¹³ in a

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
						rehabilitation domain (on equivalent landform groups), that has experienced a stress event, are present.
				Long-term sustainability of rehabilitation outcomes is demonstrated.	Attainment of completion criteria.	Legacy areas (rehabilitated before 2001, Appendix 1 Figure 1)¹⁸: - all rehabilitation completion criteria have been met during the first monitoring event; or - all rehabilitation completion criteria have been met on a minimum of three consecutive occasions over a period of not less than 3 years. Rehabilitation domains rehabilitated since 2001: - all rehabilitation completion criteria have been met on a minimum of three consecutive occasions over a period of not less than 3 years.
Conservation Use ¹	- Treatment plant (old) - Access - Treatment plant (new) - Township - Infrastructure - Dams and diversions	Stockpile and mill outwash Mining access roads, power lines, sand and water transport systems not to be retained Process pond and new mill infrastructure not to be retained	Socio-economic	<i>Conservation Use</i> is confirmed by TOs as the preferred post-mining land use prior to relinquishment ¹ .	Documentation.	Documented confirmation exists that <i>Conservation Use</i> remains the preferred post-mining land use prior to relinquishment.
				Rehabilitation to include plants recognised by TOs as important food plants or those having the potential for commercial exploitation by TOs (referred to generally as 'special use plants') ⁵ through inclusion of planting material in revegetation works.	Species composition.	Two or more (≥2) special use plants (Appendix 2 Table A)⁵ are recorded in each rehabilitation domain.

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
		Township infrastructure (not to be retained) Infrastructure (not to be retained)	Landscape context ¹⁹	Mining on the project area will not result in the loss of a rare or significant landform type ⁶ in the Cape Flattery Dunefield.	Land occupied by a rare or significant landform type⁶ disturbed by mining on the project area.	No loss of a rare or significant landform type (Appendix 2 Table B)⁶ in the Cape Flattery Dunefield as a result of mining on the project area.
		Dams and diversions (not to be retained)	Structure/ species composition	The rehabilitation strategy shall maximise the likely return of native plant species represented in the un-mined Cape Flattery Dunefield.	Documentation of topsoil, trash and/or brushmatting placement¹¹.	Propagules are returned to rehabilitated areas in the form of applied stored/direct placed topsoil, trash or brushmatting¹¹.
				Declared pest plants ² are being managed to minimise their threat to the surrounding landscape.	- Documentation of weed management. - Presence and proportion of declared pest plant² species.	- A Weed Management Plan is implemented to minimise the weed burden on lease areas and the risk of infestation in rehabilitated areas. - No declared pest plants² are recorded in the rehabilitation domain; or The proportion of declared pest plant species relative to reference conditions is not increasing².
				Fauna recolonisation from the surrounding landscape is promoted through the provision of vegetation community structure in dominant landform groups in rehabilitation domains ¹² similar to the landform groups in the surrounding ecosystem.	Vegetation structure.	Crown class⁴ equivalent to, or crown cover (%) progressing towards, that of surrounding undisturbed vegetation community⁴ on dominant landform groups in rehabilitation domains¹².

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
			Ecosystem function	Plant functional group richness on dominant landform groups in rehabilitation domains ¹² similar to or greater than the surrounding landscape.	- Species composition. Plant functional group richness.	- At least 70% of the plant functional groups¹³ present in reference sites (on equivalent landform groups) are represented in the rehabilitation domains¹⁴; or - In areas of standing water or regular periodic inundation, characterised by the accumulation of organic detritus in depressions, at least two species of flora wetland indicator species¹⁵ are present.
				The rehabilitation shows active recruitment of species from the surrounding landscape (a normal function of a recovering ecosystem).	- Species composition. - Documentation of seed mix or tubestock planting applied¹⁶. - Evidence of flowering and reproduction.	- Native species that are not in the original revegetation broadcast seed or planted tubestock species mix¹⁶ are present in each landform group within each rehabilitation domain; and - At least 3 native species¹⁷ are reproductively mature (flowering or seeding); and - At least 3 native species have at least 1 seedling or sapling¹⁷.
			Ecosystem stability / resilience	Vegetation community resilient to periodic stress (drought, cyclone or fire nominated as the stresses likely to affect rehabilitation outcomes).	- Annual rainfall (as an indicator of drought). - Fire events. - Tropical cyclones. Plant functional group richness.	- All other rehabilitation criteria have been met and the rehabilitation domain has at some point since seeding or final surface preparation experienced either: - at least one year with annual rainfall in the first decile range; or - at least one fire event covering > 50% of the rehabilitation domain; or - at least one severe tropical cyclone (Category 3 or greater); or - if the rehabilitation domain has never experienced one of the stress events (<i>i.e.</i> i, ii, or iii), then at least 80% of the plant functional groups¹³ in a

Post-mining land use description	Disturbance category	Disturbance type	Main attribute group	Rehabilitation objectives	Indicators	Completion criteria
						rehabilitation domain (on equivalent landform groups), that has experienced a stress event, are present.
				Long-term sustainability of rehabilitation outcomes is demonstrated.	Attainment of completion criteria.	- Legacy areas (rehabilitated before 2001, Appendix 1 Figure 1)¹⁸: - all rehabilitation completion criteria have been met during the first monitoring event; or - all rehabilitation completion criteria have been met on a minimum of three consecutive occasions over a period of not less than 3 years. Rehabilitation domains rehabilitated since 2001: - all rehabilitation completion criteria have been met on a minimum of three consecutive occasions over a period of not less than 3 years.

¹ Post-mining land use *Conservation Use* has been nominated for areas not identified by Hope Vale Owners for alternative uses. Prior to lease surrender Hope Vale Owners may nominate alternative suitable post-mining land uses (for example, retention of some roads or development of horticulture areas). Where alternative post-mining land uses are agreed between the holder of this environmental authority and Hope Vale Owners these nominated post-mining land uses will be adopted. Infrastructure/ assets that are not to be retained under Hope Vale Owner Use will revert to Conservation Use as a post-mining land use.

² Declared pest plant is defined as a *Restricted or Prohibited Matter* under the Queensland Biosecurity Act 2014, or are listed under the Weeds of National Significance list (DoEE 2016) and/or the National Environmental Alert List (DoEE 2016). '**Not increasing**' is defined as the difference between rehabilitated and reference conditions not showing a successive increase over three successive monitoring events. DoEE 2016, *National weeds lists*, Australian Government Department of the Environment and Energy, Canberra, <<http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/index.html>>.

³ Intentionally left blank

⁴ Crown class according to Neldner *et al.* (2019) Table 28. If assessment of crown class shows that the rehabilitated domain is not equivalent to surrounding vegetation, crown cover (%) must be increasing towards equivalent crown class. '*Equivalent to*' means a crown class equal to or denser than that of the surrounding vegetation. '*Increasing*' defined as showing a net increase over three successive monitoring events (or until equivalence is reached). Neldner, VJ, Wilson, BA, Dillewaard, HA, Ryan, TS, Butler, DW, McDonald, WJF, Addicott, EP & Appelman, CN, 2019, *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland version 5.0*, Queensland Department of Environment and Science, Brisbane.

⁵ Special use plants, that are recognised by Traditional Owners as important food plants or those having potential for commercial exploitation, are listed in **Appendix 2 Table A**.

⁶ Rare or significant landform types in the Cape Flattery dunefield, and the pre-mining area of each landform type, are listed in **Appendix 2 Table B**.

⁷ Refer to **Appendix 2 Table C** for landform characteristic classes and data used to generate landform elements.

⁸ The 30 common landform elements are 111, 112, 113, 114, 121, 122, 123, 124, 134, 211, 212, 213, 214, 221, 222, 223, 224, 233, 234, 311, 312, 313, 314, 321, 322, 323, 324, 332, 333 and 334.

⁹ The landform elements that cover 95% of the un-mined dunefield are 111, 112, 113, 114, 121, 122, 123, 124, 211, 212, 213, 214, 221, 222, 224, 311, 312, 313, 314, 321, 322, 324, 332 and 334.

- ¹⁰ Refer to **Appendix 2 Table D** for the list of landform types that occur in the un-mined Cape Flattery dunefield relevant to the borrow pits and mined-out areas, and the baseline proportions of landform elements which comprise each landform type.
- ¹¹ Pre-2012: Based on inclusion of procedures for the application of stored/direct placed topsoil, trash or brushmatting to rehabilitated areas. Areas rehabilitated before 2012 are shown on **Appendix 1 Figure 2**.
- ¹² Refer to **Appendix 2 Table E** for landform group classification and landform group descriptions. Dominant landform groups will be the two landform groups, when ranked by land area, that account for the top 50% (or more) of the rehabilitation domain. To achieve a 'high' to 'very high' sampling intensity, relative to the total area of dominant landform group at each rehabilitation domain (as per McKenzie *et al.* (2008) Table 3.1); a rehabilitation domain will comprise of at least one rehabilitation area (grouped by similar age, treatment and/or proximity) and must have a cumulative area greater than 1.8 ha and less than 40 ha.
McKenzie, NJ, Grundy, MJ, Webster, R & Ringrose-Voase, AJ 2008, *Guidelines for surveying soil and land resources, Australian Soil and Land Survey Handbooks Series, Second Edition*, CSIRO Publishing, Collingwood, Victoria.
- ¹³ Refer to **Appendix 2 Table F** for the plant functional group codes that are used to determine the plant functional group for each plant species.
- ¹⁴ On at least one occasion per monitoring site, it will be necessary to validate that plants regarded as nitrogen fixers show these functions, or those forming mycorrhizal associations show these functions or conditions are favourable in rehabilitated domains (*i.e.* soil has demonstrated mycorrhizal infection in bait plants).
- ¹⁵ Flora wetland indicator species are native plants that are adapted to and dependent on wet conditions for at least part of their life cycle, and can successfully reproduce in wet conditions (DES 2019). Wet conditions are defined as areas where the root zone of the plant becomes periodically saturated or inundated during the growing season (DES 2019). DES 2019, *Wetland flora (plants)*, *WetlandInfo*, Queensland Department of Environment and Science, Brisbane, <<https://wetlandinfo.des.qld.gov.au/wetlands/ecology/components/flora/>>.
- ¹⁶ Verification that native species are present in rehabilitation domains that were not introduced in the seed mix/tubestock planting. For areas rehabilitated pre-2012 (**Appendix 1 Figure 2**): the seed or planted tubestock species mix is based on the plant species listed in the **Appendix 2 Table G**. Areas rehabilitated post-2012: this is based on records of planting stock used in individual rehabilitation areas which will be provided with the Annual Return for Environmental Authority EPML00550113. The species lists provided in the Annual Returns for areas rehabilitated after 2012 should be used to assess natural recruitment of plants into these areas.
- ¹⁷ These criteria are based on 'very good' condition assessment class in the *Native Vegetation Condition Assessment and Monitoring Manual for Western Australia* (Casson *et al.* 2009). Casson, N, Downes, S & Harris, A 2009, *Native vegetation condition assessment and monitoring manual for Western Australia*, Western Australia Department of Environment and Conservation, Perth.
- ¹⁸ Legacy areas were rehabilitated before 2001 and are shown on **Appendix 1 Figure 1**.
- ¹⁹ Landscape context relates to topographic features and complexity. The method to create the data that is required to assess the landscape context completion criteria given in **Schedule F - Table 2b**, is provided in **Appendix 2 Table C** and **Appendix 2 Table D**.

END OF CONDITIONS FOR SCHEDULE F

Schedule G - Community**Complaint response**

- (G1-1) All complaints received must be recorded including details of complainant, reasons for the complaint, investigations undertaken, conclusions formed and actions taken. This information must be made available for inspection by the administering authority on request.

END OF CONDITIONS FOR SCHEDULE G

Schedule H - Definitions

“acceptance criteria” means the measures by which the actions implemented to rehabilitate the land are deemed to be complete (same as completion criteria).

Active mining includes land:

- a) that is cleared of vegetation, stripped of topsoil, and where sand is being extracted for processing
- b) that is an active rejects area.

The upper limit for active mining at any one time is 150 ha.

“appropriately qualified person” means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

“active gegenwalles” means a rare and significant landform on the Cape Flattery dunefield that is characterised by small vegetated ridges (less than 2 m), that run perpendicular to the prevailing wind with deflation areas of bare sand, devoid of vegetation and seasonally inundated, occurring between the ridges.

“authority” means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

“certified” means assessed and approved by an appropriately qualified and experienced person via a written declaration.

“commercial place” means a place used as an office or for business or commercial purposes, other than a place within the boundaries of the operational land.

“competent person” means a person with the demonstrated skill and knowledge required to carry out the task to a standard necessary for the reliance upon collected data or protection of the environment.

“Crown Class” is determined in accordance with the methodology outlined in Neldner, VJ, Wilson, BA, Dillewaard, HA, Ryan, TS, Butler, DW, McDonald, WJF, Addicott, EP & Appelman, CN, 2019, Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland version 5.0, Queensland Department of Environment and Science, Brisbane.

“declared pest plants” means a plant that is defined as a *Restricted or Prohibited Matter* under the Queensland *Biosecurity Act 2014*, or are listed under the Weeds of National Significance list (DoEE 2016) and/or the National Environmental Alert List (DoEE 2016). DoEE 2016, *National weeds lists*, Australian Government Department of the Environment and Energy, Canberra, <<http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/index.html>>.

“deflation corridor of active elongate/ parabolic dune” means the areas of low relief that occur between the trailing arms of active elongate parabolic dunes formed by the removal of sand by wind.

“elongate parabolic dune head” means a rare and significant landform on the Cape Flattery dunefield that is characterised by an actively advancing apical dune head of an elongate parabolic dune. It has a single or several slip faces with the upwind side paralleling the downwind side which are both devoid of vegetation.

“environmental authority holder” means the holder of this environmental authority.

“extensive development of small parabolic dune and associated deflation areas” means a rare and significant landform on the Cape Flattery dunefield that comprises of a field of parabolic dunes that are too small to be mapped individually. They are produced by local remobilisation of sand from their associated deflation areas.

“fit for purpose” means the purpose that something is designed or expected to fulfil and meets relevant standards.

“flora wetland indicator species” means native plants that are adapted to and dependent on wet conditions for at least part of their life cycle, and can successfully reproduce in wet conditions. The root zone of the plant becomes periodically saturated or inundated during the growing season.

“gegenwalles modified by parabolic dune inception” means a rare and significant landform on the Cape Flattery dunefield that is characterised by gegenwalles formations that have been substantially modified by the development of small parabolic dunes at the windward side of the landform.

“land” in the “land schedule” of this document means land excluding waters and the atmosphere.

“land capability” as defined in the DME 1995 Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.

“landscape context” relates to topographic features and complexity. The method to create the data that is required to assess the landscape context completion criteria given in **Schedule F - Table 2b**, is provided in **Appendix 2 Table C** and **Appendix 2 Table D**.

“landform element” means parts of a landform with defined unique combinations of slope, relief and aspect. Refer to **Appendix 2 Table C** for landform characteristic classes and data used to generate landform elements.

“Landform element richness” means the number of landform elements recorded in an area.

“Landform group” means the landform elements that grouped according to their collective influence on vegetation structure and composition. Refer to **Appendix 2 Table E** for the landform group classification, and a description of each landform group, for assessment of relevant ecological criteria.

“Landform type” The type of landscape feature which occurs in the Cape Flattery dunefield (e.g. coastal parabolic dune, waterbody, long narrow ridges). Refer to **Appendix 2 Table D** for the landform types that naturally occur in the Cape Flattery dunefield.

“land use” term to describe the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

“legacy areas” means land that was rehabilitated before 2001 and are shown on **Appendix 1 Figure 1**.

Mobile infrastructure includes:

- a) infrastructure that can be relocated from one position to another
- b) land area associated with access tracks, conveyors, pipelines, slurry lines, power lines, transfer stations and mill infrastructure.

The upper limit for the disturbance area occupied by mobile infrastructure at any one time is 125 ha.

Non-active mining includes disturbed land that is not active mining, mobile infrastructure or exploration.

“not increasing” is defined as the difference between rehabilitated and reference conditions not showing a successive increase over three successive monitoring events.

“offensive” means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

“protected area” means - a protected area under the Nature Conservation Act 1992; or

- a) a marine park under the Marine Parks Act 1992; or
- b) a World Heritage Area.

“Plant functional group” means plants that are grouped according to their functional attributes and traits (ie growth form, primary regeneration mode and nutrient acquisition strategy). Refer to **Appendix 2 Table F** for the plant functional group codes that are used to determine the plant functional group for each plant species.

“Plant functional group richness” - The number of plant functional groups recorded in an area.

“progressive rehabilitation” means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as mining operations are ongoing.

“rehabilitation” the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

“rehabilitation area” means an area of land that is no longer active for mining and rehabilitation of that land has progressed (i.e. terraforming has occurred).

“rehabilitation domain” means one or more rehabilitation areas that are grouped by similar age, treatment and/or proximity and have a cumulative area greater than or equal to 1.8 ha and less than or equal to 40 ha.

“relict gegenwalles” means a rare and significant landform on the Cape Flattery dunefield that is characterised by gegenwalles that have been covered in vegetation and are no longer active.

“relief” means the difference in elevation relative to the surrounding landscape.

“significant disturbance” – includes land

- (a) if it is contaminated land; or
- (b) it has been disturbed and human intervention is needed to rehabilitate it.
 - i. to a state required under the relevant environmental authority; or
 - ii. if the environmental authority does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance.

Some examples of disturbed land include:

- areas where soil has been compacted, removed, covered, exposed or stockpiled;
- areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion; (vegetation & topsoil)
- areas where land use suitability or capability has been diminished;
- areas within a watercourse, waterway, wetland or lake where mining activities occur;
- areas submerged by tailings or hazardous contaminant storage and dam walls in all cases;
- areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after mining activities have ceased; or
- areas where land has been contaminated and a suitability statement has not been issued.

However, the following areas are not included:

- areas off lease (e.g. roads or tracks which provide access to the mining lease);
- areas previously significantly disturbed which have achieved the rehabilitation outcomes;
- by agreement with the EPA, areas previously significantly disturbed which have not achieved the rehabilitation objective(s) due to circumstances beyond the control of the mine operator (such as climatic conditions);
- areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be left by agreement with the landowner. The agreement to leave permanent infrastructure must be recorded in the Landowner Agreement and lodged with the EPA;
- disturbances that pre-existed the grant of the tenure unless those areas are disturbed during the term of the tenure.

“sensitive place” means;

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- an educational institution; or

- a medical centre or hospital; or
- a protected area under the Nature Conservation Act 1992, the Marine Parks Act 1992 or a World Heritage Area; or
- a public park or gardens; or
- a place used as a workplace, an office or for business or commercial purposes which is not part of the mining activity and does not include employees accommodation or public roads.

“special use plants” plants that are recognised by Traditional Owners as important food plants or those having potential for commercial exploitation, are listed in **Appendix 2 Table A**.

“stable” means geotechnical stability of the rehabilitated landform where instability related to the excessive settlement and subsidence caused by consolidation / settlement of the wastes deposited, and sliding / slumping instability has ceased.

“trivial harm” means environmental harm which is not material or serious environmental harm and will not cause actual or potential loss or damage to property of an amount of, or amounts totalling more than \$5,000.

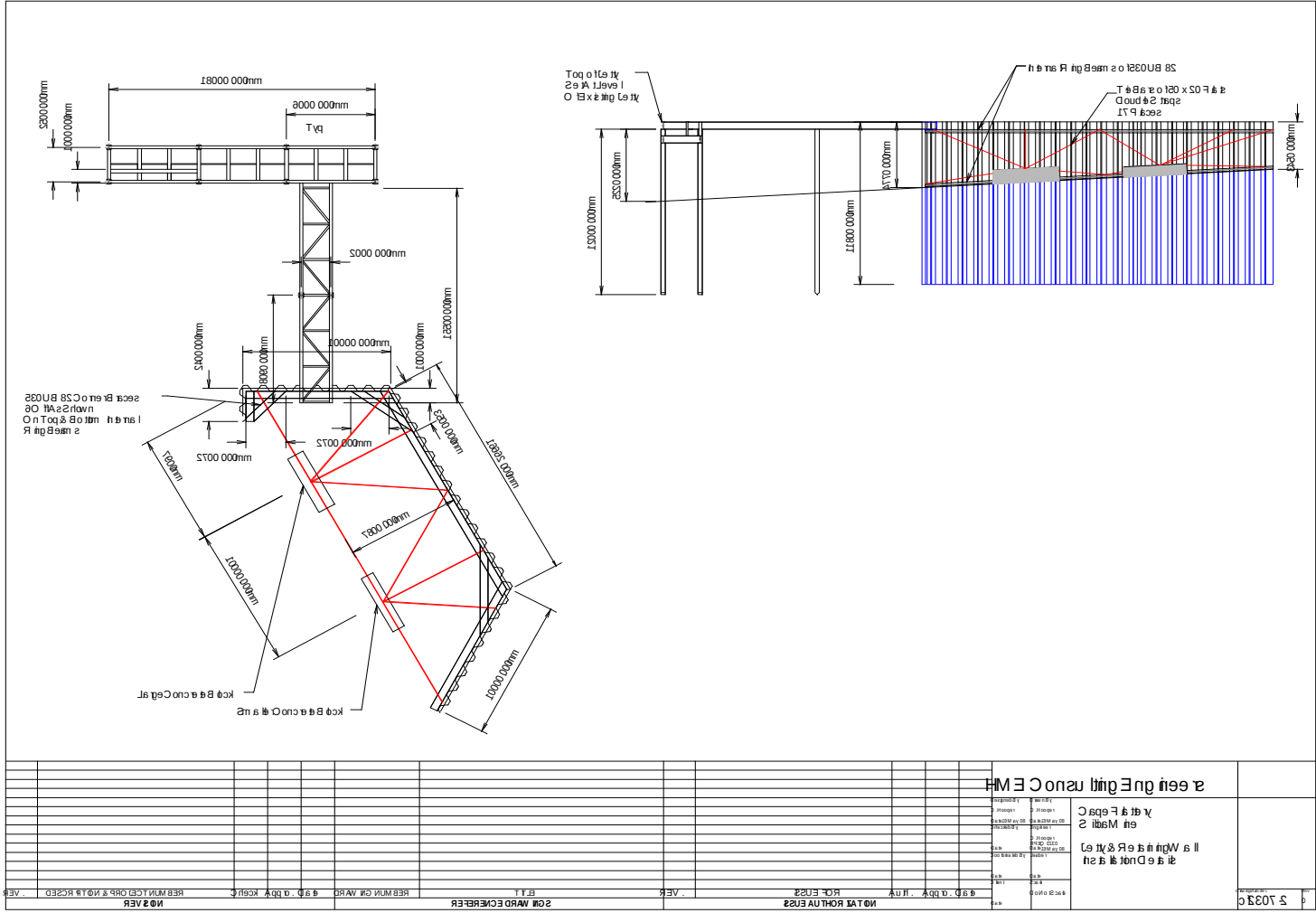
“waters” includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea) or any part thereof.

END OF CONDITIONS FOR SCHEDULE H

Appendix 1 - Maps and Figures



Map 1 – Water Monitoring Locations



Map 2 - Proposed New Service Jetty and Hardstand - General Arrangements

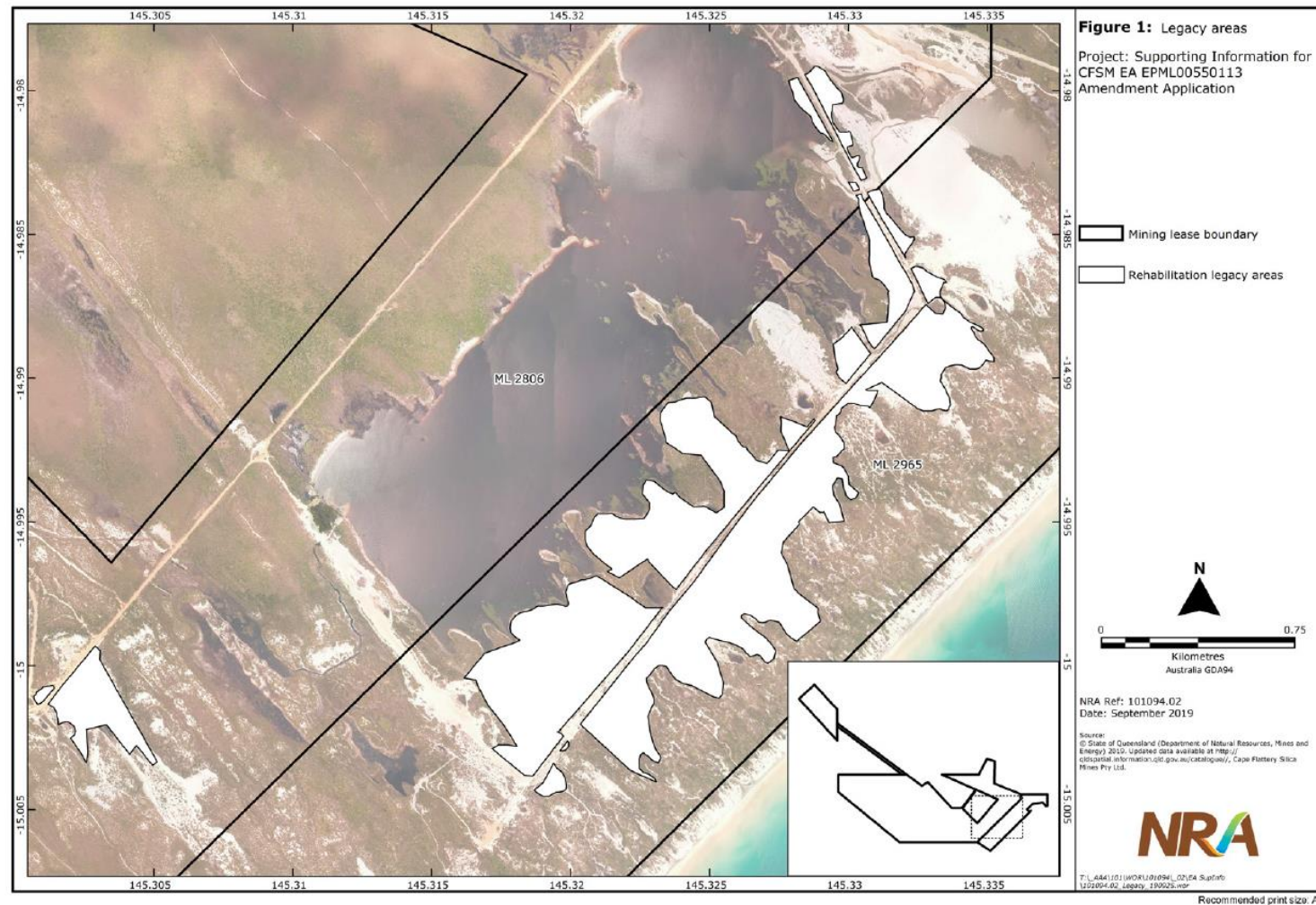


Figure 1: Legacy areas

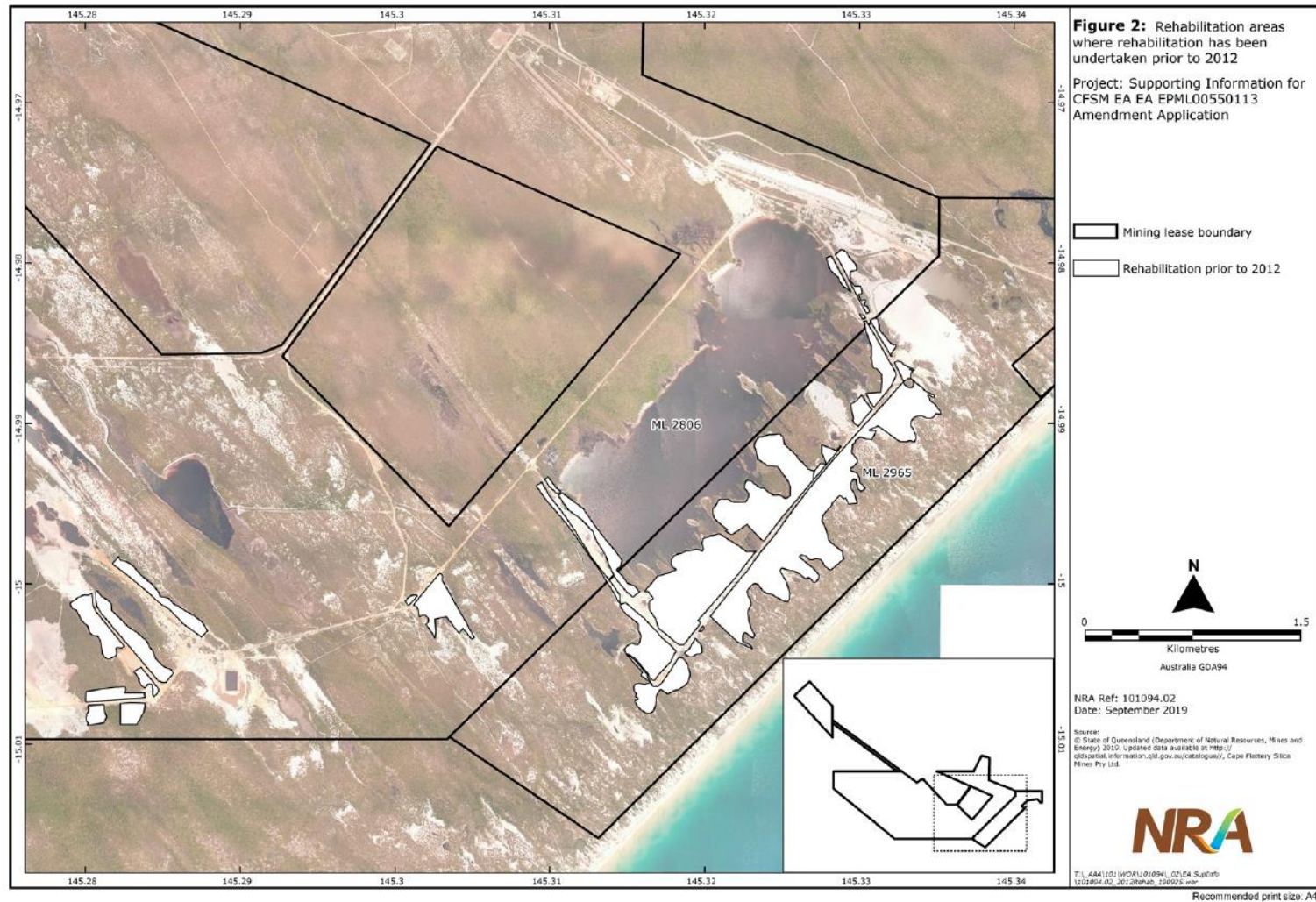


Figure 2: Rehabilitation areas where rehabilitation has been undertaken prior to 2012



Figure 3: Authorised Maximum Surface Areas of Disturbance

Appendix 2

Supporting rehabilitation tables

Table A: Special Use Plants recognised by Traditional Owners

Family	Species
Chrysobalanaceae	<i>Parinari nonda</i>
Combretaceae	<i>Terminalia muelleri</i>
Ebenaceae	<i>Diospyros compacta</i>
Ericaceae	<i>Leucopogon ruscifolius</i>
Fabaceae	<i>Labichea buettneriana</i>
Menispermaceae	<i>Tinospora esiangkara</i>
Myrtaceae	<i>Asteromyrtus lysicephala</i>
Myrtaceae	<i>Leptospermum polygalifolium</i>
Myrtaceae	<i>Lithomyrtus obtusa</i>
Myrtaceae	<i>Melaleuca polandii</i>
Myrtaceae	<i>Syzygium banksii</i>
Myrtaceae	<i>Syzygium forte</i> subsp. <i>forte</i>
Myrtaceae	<i>Syzygium suborbiculare</i>
Myrtaceae	<i>Thryptomene oligandra</i>
Myrtaceae	<i>Xanthostemon arenarius</i>
Proteaceae	<i>Grevillea pteridifolia</i>
Proteaceae	<i>Persoonia falcata</i>
Restionaceae	<i>Baloskion tetraphyllum</i> subsp. <i>meiostachyum</i>
Rutaceae	<i>Boronia alulata</i>
Sapotaceae	<i>Manilkara kauki</i>
Sapotaceae	<i>Sersalisia sericea</i>

Table B: Cape Flattery Dunefield Rare or significant landform types¹ (pre-mining)

Cape Flattery Dunefield Rare or significant landform types	Landform type area mapped in dunefield (pre-mining)
Active gegenwalles	190 ha
Deflation corridor of active elongate/parabolic dune	888 ha
Elongate parabolic dune head	494 ha
Extensive development of small parabolic dune and associated deflation areas	147 ha
Gegenwalles modified by parabolic dune inception	309 ha
Relict gegenwalles	2300 ha

¹ These data are to be referred to for the analysis of land occupied by a rare or significant landform type. Definitions of each rare or significant landform type are provided in **Schedule H**.

Notes: Rare or significant landforms were classified in the CFSM Land Capability Report (NRA 1996). From the mapping presented in NRA (1996) and with reference to the Landform Mapping of Cape Flattery Dunefield Report (NRA 1995) and to the Assessment of the Cape Bedford - Cape Flattery Dunefield for National Estate Listing (Stock 1991) the rare or significant landforms were inferred. The landform areas were calculated from NRA (1995).

NRA 1996, *Land Capability Report*, Report prepared for CFSM Pty Ltd by NRA Environmental Consultants, dated December 1996.

NRA 1995, *Landform Mapping of Cape Flattery Dunefield*, prepared for CFSM Pty Ltd by NRA Environmental Consultants, November 1995.

Stock, EC 1991, *Assessment of the Cape Bedford - Cape Flattery Dunefield for National Estate Listing*, Objection Assessment, A Report to the Australian Heritage Commission, September 1991.

Table C: Landform characteristic classes used to generate landform elements¹

Relief ²	Code identifier	Slope angle	Code identifier	Slope aspect	Code identifier
<5 m	100	<10°	10	87.5° - 177.5°	1
5 m – 10 m	200	10° - 30°	20	177.5° - 267.5°	2
10 m – 35 m	300	>30°	30	267.5° - 357.5°	3
>35 m	400	-	-	357.5° - 87.5°	4

¹ Landform element data (generated from relief, slope angle and slope aspect characteristic classes) for assessment of rehabilitation areas and domains is to be generated using a Digital Elevation Model (DEM) (created using a triangulation method) with a grid cell size equal to or less than 2 m.

For example, landform element 331 = 10 – 35 m relief, >30° slope, and south-easterly aspect.

² Relief is the difference in elevation relative to the surrounding landscape (ie Australian Height Datum (AHD) DEM minus Lake Reference DEM). Point data that are used to create the Lake Reference DEM are provided in Appendix 2 Table C(i).

Table C(i): Cape Flattery Silica Mine elevation point data for the creation of Lake Reference DEM for landform element relief component¹

Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94	
	Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude
0.5	145.3190	-15.0090	5	145.3260	-14.9936	5.5	145.3270	-14.9782	6.5	145.3070	-14.9991	8	145.3070	-15.0067	13	145.2480	-14.9769	19	145.2790	-14.9980
1	145.3410	-14.9888	5.5	145.3030	-15.0242	5.5	145.3280	-14.9873	6.5	145.3080	-15.0011	8.5	145.3010	-14.9863	13	145.2480	-14.9771	20	145.2610	-14.9928
1.5	145.2940	-14.9643	5.5	145.3050	-15.0098	5.5	145.3280	-14.9852	6.5	145.3080	-15.0004	8.5	145.3030	-14.9944	13	145.2480	-14.9710	20.5	145.2510	-14.9875
1.5	145.3050	-14.9637	5.5	145.3190	-14.9954	5.5	145.3280	-14.9838	6.5	145.3090	-15.0012	10	145.2490	-14.9657	13.5	145.2490	-14.9786	20.5	145.2520	-14.9867
1.5	145.3420	-14.9864	5.5	145.3190	-14.9777	5.5	145.3280	-14.9863	6.5	145.3090	-15.0014	10	145.2500	-14.9623	13.5	145.2500	-14.9784	20.5	145.2520	-14.9875
2	145.3050	-14.9639	5.5	145.3200	-14.9806	5.5	145.3280	-14.9817	6.5	145.3100	-15.0018	10.5	145.3010	-15.0020	13.5	145.2500	-14.9790	20.5	145.2520	-14.9878
2.5	145.3080	-15.0131	5.5	145.3200	-14.9886	5.5	145.3280	-14.9826	6.5	145.3100	-15.0019	10.5	145.3020	-15.0018	13.5	145.2510	-14.9790	20.5	145.2620	-14.9936
2.5	145.3090	-15.0135	5.5	145.3200	-14.9945	5.5	145.3280	-14.9831	6.5	145.3100	-15.0025	10.5	145.3020	-15.0020	13.5	145.2510	-14.9794	21	145.2260	-14.9774
2.5	145.3100	-15.0140	5.5	145.3200	-14.9956	5.5	145.3280	-14.9806	6.5	145.3100	-15.0024	10.5	145.3030	-15.0018	13.5	145.2630	-14.9827	21	145.2510	-14.9849
2.5	145.3440	-14.9835	5.5	145.3200	-14.9999	5.5	145.3290	-14.9906	6.5	145.3120	-15.0016	11	145.2540	-14.9706	14	145.2690	-14.9717	21	145.2530	-14.9872
3	145.3050	-14.9640	5.5	145.3210	-14.9844	5.5	145.3290	-14.9864	6.5	145.3150	-15.0042	11	145.2540	-14.9709	14	145.2780	-14.9872	21	145.2660	-15.0240
3	145.3060	-15.0236	5.5	145.3210	-14.9819	5.5	145.3290	-14.9875	6.5	145.3350	-14.9780	11	145.2550	-14.9725	15	145.2720	-14.9859	21	145.2660	-15.0242
3	145.3410	-14.9838	5.5	145.3220	-14.9925	5.5	145.3290	-14.9857	6.5	145.3350	-14.9816	11	145.2560	-14.9720	15	145.2810	-14.9932	21	145.2660	-15.0244
3	145.3430	-14.9834	5.5	145.3220	-14.9928	5.5	145.3290	-14.9859	6.5	145.3360	-14.9790	11	145.2560	-14.9727	15	145.2850	-14.9983	21	145.2660	-15.0249
3.5	145.3260	-14.9996	5.5	145.3220	-14.9935	5.5	145.3290	-14.9848	6.5	145.3370	-14.9786	11	145.2600	-14.9729	15	145.2850	-14.9981	21.5	145.2150	-14.9759
3.5	145.3330	-14.9903	5.5	145.3220	-14.9940	5.5	145.3300	-14.9885	6.5	145.3370	-14.9802	11	145.2640	-14.9833	15	145.2850	-14.9983	22	145.2490	-14.9857
3.5	145.3340	-14.9890	5.5	145.3220	-14.9946	5.5	145.3300	-14.9872	6.5	145.3380	-14.9829	11	145.2640	-14.9845	15	145.2860	-14.9988	22.5	145.2900	-15.0058
3.5	145.3400	-14.9839	5.5	145.3230	-14.9975	5.5	145.3300	-14.9879	6.5	145.3380	-14.9829	11	145.2650	-14.9853	15	145.2860	-14.9995	23	145.2740	-15.0061
3.5	145.3440	-14.9827	5.5	145.3230	-14.9947	5.5	145.3300	-14.9851	7	145.3030	-15.0164	11	145.2660	-14.9832	15.5	145.2740	-14.9880	23	145.2740	-15.0067
4	145.3120	-15.0126	5.5	145.3230	-14.9937	5.5	145.3300	-14.9858	7	145.3040	-15.0182	11	145.2660	-14.9857	16	145.2300	-14.9687	23.5	145.2590	-14.9976
4	145.3270	-14.9978	5.5	145.3240	-14.9961	5.5	145.3390	-14.9804	7	145.3090	-14.9982	11	145.2670	-14.9844	17	145.2810	-14.9996	24.5	145.2250	-14.9788
4	145.3310	-14.9919	5.5	145.3240	-14.9770	5.5	145.3390	-14.9822	7	145.3370	-14.9802	11	145.2670	-14.9858	17	145.2810	-14.9977	24.5	145.2250	-14.9787
4	145.3320	-14.9875	5.5	145.3240	-14.9933	6	145.3130	-15.0038	7	145.3400	-14.9779	11	145.2670	-14.9874	17	145.2830	-15.0010	25	145.2660	-14.9995
4	145.3350	-14.9870	5.5	145.3260	-14.9909	6	145.3150	-15.0029	7	145.3420	-14.9774	11	145.2670	-14.9877	17	145.2840	-15.0020	25.5	145.2250	-14.9795
4	145.3390	-14.9841	5.5	145.3260	-14.9924	6	145.3160	-15.0020	7	145.3420	-14.9766	11	145.2690	-14.9887	17	145.2840	-15.0025	27.5	145.2070	-14.9754

Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94		Elevation (m AHD)	GDA94	
	Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude		Longitude	Latitude
4.5	145.3070	-15.0100	5.5	145.3260	-14.9888	6	145.3210	-14.9781	7	145.3420	-14.9771	11	145.2700	-14.9871	17.5	145.2040	-14.9625	27.5	145.2640	-15.0013
4.5	145.3080	-15.0105	5.5	145.3260	-14.9850	6	145.3220	-14.9922	7	145.3420	-14.9761	11	145.2700	-14.9886	17.5	145.2770	-14.9957	28	145.2100	-14.9789
4.5	145.3250	-14.9983	5.5	145.3260	-14.9779	6	145.3230	-14.9926	7	145.3430	-14.9783	11	145.2710	-14.9883	17.5	145.2780	-14.9952	28	145.2100	-14.9791
4.5	145.3290	-14.9927	5.5	145.3260	-14.9932	6	145.3260	-14.9845	7.5	145.3020	-15.0207	11	145.2710	-14.9888	18	145.2800	-14.9983	28	145.2130	-14.9822
4.5	145.3400	-14.9828	5.5	145.3270	-14.9862	6	145.3270	-14.9827	7.5	145.3030	-15.0161	11	145.3010	-15.0019	18	145.2800	-14.9972	30.5	145.2460	-14.9974
4.5	145.3410	-14.9831	5.5	145.3270	-14.9851	6	145.3380	-14.9790	7.5	145.3030	-15.0155	11.5	145.2630	-14.9832	18.5	145.2800	-14.9982	31.5	145.2450	-15.0009
5	145.3060	-15.0195	5.5	145.3270	-14.9840	6.5	145.3050	-15.0173	7.5	145.3330	-14.9769	12	145.2710	-14.9892	19	145.2260	-14.9744	31.5	145.2470	-15.0017
5	145.3140	-15.0089	5.5	145.3270	-14.9824	6.5	145.3060	-14.9981	7.5	145.3330	-14.9764	12.5	145.2840	-14.9925	19	145.2710	-15.0257	32	145.2490	-15.0022
5	145.3260	-14.9941	5.5	145.3270	-14.9829															

¹ These data are to be used to create the Lake Reference DEM which is then used to calculate relief. These point data were derived from the surface water elevations of lakes that occur in the Cape Flattery dunefield.

Table D: Baseline proportions of landform elements within each landform type in the un-mined natural dunefield

Landform type ^{1,2}	Landform element proportion (%) of landform type ³											
	111	112	113	114	121	122	123	124	131	132	133	134
Active gegenwalles	10.5622	15.3794	10.3839	52.5581	0.3874	1.8761	0.5866	2.7634	0.0050	0.0158	0.0140	0.0529
Coastal parabolic dunes	8.5788	9.2444	4.9059	14.8323	2.6129	7.6858	2.1867	7.4096	0.0366	0.4228	0.1469	0.4224
Deflation corridor of active elongate/parabolic dune	12.1363	15.8274	8.6020	45.9789	0.5055	2.1935	0.5663	2.7762	0.0027	0.0325	0.0150	0.0275
Depositional area in deflation corridor	11.2686	14.0597	15.5791	49.2055	0.8484	1.9811	0.9722	2.1979	0.0070	0.0373	0.0345	0.0439
Elongate parabolic dune head	1.0412	1.4847	0.6461	3.5281	0.2383	2.0098	0.3642	2.7931	0.0091	0.2707	0.0960	0.4747
Extensive development of small parabolic dune and associated deflation areas	12.4651	19.3504	17.1167	42.5380	0.4855	1.3415	1.1937	1.1409	0.0000	0.0060	0.0074	0.0098
Gegenwalles modified by parabolic dune inception	23.1685	18.4960	3.9785	49.8857	0.0721	0.2096	0.1768	0.3618	0.0000	0.0000	0.0000	0.0067
III-defined lakes and swamps	10.9993	16.5982	12.6560	45.9403	0.4079	1.5091	0.6248	1.7545	0.0003	0.0262	0.0105	0.0282
Inter-dune sand plains <20 m ⁴	10.7109	15.4387	6.5552	34.6443	0.3962	1.2473	0.4006	1.5105	0.0074	0.0135	0.0071	0.0126
Inter-dune sand plains >20 m ⁴	6.5331	10.3129	3.0977	18.1462	0.1650	0.9159	0.2577	1.3929	0.0005	0.0077	0.0064	0.0253
Long narrow ridges	1.7665	5.0487	1.3160	7.3169	0.2090	4.2215	0.3282	3.8767	0.0044	0.3153	0.0305	0.1545
Relict gegenwalles	17.2016	36.9290	2.3307	40.7464	0.0378	1.3373	0.1096	0.2511	0.0000	0.0021	0.0022	0.0000
Small deflation areas	18.2296	11.7787	9.9205	41.0952	1.1972	1.3679	0.7729	2.7102	0.0000	0.0288	0.0000	0.0301
Small parabolic dunes	6.0700	7.6752	5.2957	15.3524	1.6984	3.9107	1.5809	3.9749	0.0349	0.2544	0.1610	0.3527
Transition: Lakes and swamps with small deflation areas	18.4041	18.5980	11.4956	41.5304	0.3875	0.5950	0.7272	0.7434	0.0000	0.0000	0.0000	0.0000
Landform type ^{1,2}	Landform element proportion (%) of landform type ³											
	211	212	213	214	221	222	223	224	231	232	233	234
Active gegenwalles	0.6649	0.7526	0.1767	0.3771	0.3259	0.7053	0.2110	0.7763	0.0086	0.0720	0.0196	0.1492
Coastal parabolic dunes	2.3528	2.3682	1.3519	2.5722	2.9581	5.7451	1.7136	5.5912	0.1293	0.9332	0.3624	0.9682
Deflation corridor of active elongate/parabolic dune	1.3593	1.1386	0.6754	2.0796	0.4442	1.0115	0.2231	1.2907	0.0119	0.0509	0.0431	0.0884
Depositional area in deflation corridor	0.4405	0.5258	0.4920	0.7846	0.2945	0.3609	0.2447	0.3882	0.0150	0.0425	0.0358	0.0588
Elongate parabolic dune head	0.5414	0.6342	0.2188	0.8512	0.6298	3.3723	0.3846	3.2248	0.0408	1.7997	0.7615	2.7412
Extensive development of small parabolic dune and associated deflation areas	0.6930	0.7032	0.4727	0.7141	0.3378	0.4455	0.3342	0.3716	0.0029	0.1001	0.0569	0.0507
Gegenwalles modified by parabolic dune inception	0.6187	0.6366	0.4280	0.5906	0.1739	0.5011	0.2748	0.2578	0.0000	0.0215	0.0069	0.0131
III-defined lakes and swamps	1.1509	2.0461	1.1039	2.3104	0.2793	0.5892	0.3055	0.6694	0.0014	0.0428	0.0227	0.0383
Inter-dune sand plains <20 m ⁴	3.0344	6.3812	2.8399	8.9798	0.2015	0.6548	0.2193	0.7163	0.0319	0.0181	0.0207	0.0278
Inter-dune sand plains >20 m ⁴	1.6353	2.5341	1.2869	3.7844	0.2472	1.2675	0.3498	1.4525	0.0040	0.0417	0.0314	0.1014
Long narrow ridges	1.3048	3.4841	0.8465	3.6765	0.8625	4.9938	0.6281	5.2197	0.0271	0.9310	0.1242	0.6948

Relict gegenwalles	0.0758	0.0779	0.0593	0.0699	0.0379	0.4349	0.1127	0.0721	0.0000	0.0078	0.0003	0.0000
Small deflation areas	2.0702	1.5370	1.0140	2.1627	1.1117	0.7066	0.3941	1.5328	0.0181	0.0254	0.0110	0.0241
Small parabolic dunes	1.8167	2.0054	1.3503	2.3718	2.8689	4.0864	1.7278	3.7810	0.2584	1.1777	0.8716	1.3575
Transition: Lakes and swamps with small deflation areas	2.1067	1.0378	0.9584	1.5194	0.4320	0.2695	0.6305	0.5341	0.0000	0.0000	0.0025	0.0280
Landform type ^{1,2}	Landform element proportion (%) of landform type ³											
	311	312	313	314	321	322	323	324	331	332	333	334
Active gegenwalles	0.2268	0.1479	0.0312	0.0650	0.0676	0.2201	0.0611	0.2556	0.0083	0.0478	0.0070	0.0378
Coastal parabolic dunes	1.2632	1.1906	0.7481	1.3497	1.6563	3.0564	0.9939	2.7561	0.1085	0.5539	0.2352	0.5417
Deflation corridor of active elongate/parabolic dune	0.7290	0.1328	0.0569	0.2244	0.4792	0.4210	0.0370	0.6943	0.0022	0.0432	0.0086	0.0729
Depositional area in deflation corridor	0.0153	0.0052	0.0089	0.0104	0.0098	0.0107	0.0083	0.0122	0.0000	0.0006	0.0003	0.0000
Elongate parabolic dune head	2.3270	1.2296	1.0972	3.6463	3.3477	7.0910	1.2741	6.3492	0.5166	9.9906	3.5317	11.5421
Extensive development of small parabolic dune and associated deflation areas	0.0064	0.0064	0.0039	0.0054	0.0103	0.0054	0.0098	0.0093	0.0000	0.0039	0.0001	0.0015
Gegenwalles modified by parabolic dune inception	0.0049	0.0072	0.0056	0.0016	0.0034	0.0636	0.0280	0.0000	0.0000	0.0048	0.0002	0.0019
Ill-defined lakes and swamps	0.0698	0.2047	0.1069	0.1003	0.0399	0.1340	0.0497	0.1321	0.0005	0.0218	0.0057	0.0195
Inter-dune sand plains <20 m ⁴	0.7556	1.9047	0.6864	2.0302	0.0493	0.2186	0.0511	0.2054	0.0078	0.0084	0.0044	0.0080
Inter-dune sand plains >20 m ⁴	5.6362	9.1914	3.7350	12.3139	0.8097	5.0181	1.0948	4.9491	0.0140	0.0937	0.0761	0.1774
Long narrow ridges	2.1398	4.3841	1.2288	4.1312	1.0747	11.5648	1.1182	8.8094	0.1667	3.1340	0.2867	2.8913
Relict gegenwalles	0.0107	0.0160	0.0193	0.0134	0.0000	0.0323	0.0088	0.0003	0.0000	0.0022	0.0005	0.0000
Small deflation areas	0.2187	0.1112	0.1750	0.4067	0.2942	0.0631	0.2010	0.7829	0.0000	0.0000	0.0038	0.0045
Small parabolic dunes	1.1765	1.1559	0.6977	1.2324	3.4299	4.0196	1.7718	3.9202	1.3537	3.4234	2.4030	3.5792
Transition: Lakes and swamps with small deflation areas	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landform type ^{1,2}	Landform element proportion (%) of landform type ³											
	411	412	413	414	421	422	423	424	431	432	433	434
Active gegenwalles	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Coastal parabolic dunes	0.0009	0.0006	0.0002	0.0006	0.0033	0.0035	0.0028	0.0033	0.0000	0.0000	0.0000	0.0000
Deflation corridor of active elongate/parabolic dune	0.0034	0.0000	0.0000	0.0000	0.0089	0.0058	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
Depositional area in deflation corridor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Elongate parabolic dune head	1.6775	1.9296	0.4944	1.8873	1.1613	5.0307	0.4696	2.7944	0.1582	1.7192	0.7219	1.8564
Extensive development of small parabolic dune and associated deflation areas	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Gegenwalles modified by parabolic dune inception	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Ill-defined lakes and swamps	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Inter-dune sand plains <20 m ⁴	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Inter-dune sand plains >20 m ⁴	0.2517	0.3535	0.1979	0.4551	0.1441	0.8837	0.0832	0.8829	0.0051	0.0252	0.0003	0.0105
Long narrow ridges	1.3823	2.2539	0.5075	1.4392	0.2320	3.8309	0.2078	1.7252	0.0000	0.0324	0.0165	0.0613
Relict gegenwalles	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Small deflation areas	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Small parabolic dunes	0.0635	0.0650	0.0434	0.0699	0.1757	0.2532	0.1089	0.2233	0.1381	0.2377	0.1621	0.2611
Transition: Lakes and swamps with small deflation areas	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

¹These data are to be used for the analysis of the proportion of land occupied by each landform element in each dunefield landform type relevant to the borrow pits and mined-out areas disturbance types (*ie* it excludes these landform types: outcrops, sand veneer over outcrop, stream corridors and large waterbodies).

Notes: landforms were classified in the Landform Mapping of Cape Flattery Dunefield Report (NRA 1995, *Landform Mapping of Cape Flattery Dunefield*, prepared for CFSM Pty Ltd by NRA Environmental Consultants, November 1995) with reference to the Assessment of the Cape Bedford - Cape Flattery Dunefield for National Estate Listing (Stock, EC 1991, *Assessment of the Cape Bedford - Cape Flattery Dunefield for National Estate Listing*, Objection Assessment, A Report to the Australian Heritage Commission, September 1991).

² Landform mapping was updated using contemporary elevation data captured in 2014 and aerial photography dated 2015.

(NRA 2019. *Cape Flattery Silica Mine Landform Mapping Update and Baseline Natural Un-mined Dunefield Landform Element Area Proportion Table*, prepared for CFSM Pty Ltd by NRA Environmental Consultants. Issued, 25 September 2019.)

³ Landform elements are parts of a landform with defined unique combinations of slope, relief and aspect. Refer to **Table C** for landform characteristic classes and data used to generate landform elements.

⁴ Refers to elevation above sea level (AHD).

Table E: Landform group classification and landform group descriptions

Landform group	Relief	Slope angle	Slope aspect	Relevant landform element codes ¹	Landform group description
1	<5 m	all	all	111-134	- All low-lying areas. Slope angle and aspect would have a negligible influence on vegetation structure and composition when relief is <5 m. - A high proportion of these areas are likely to be subject to waterlogging, which would influence vegetation composition similarly across each landform element.
2	≥5 m	<10°	all	211-214, 311-314, 411-414	- All relatively flat, elevated areas. - Relief above 5 m would have little influence on vegetation structure and composition within the narrow range of elevations at CFSM. - Slope aspect is unlikely to have an influence in relatively flat terrain because differences in exposure to prevailing conditions are negligible and inconsistent.
3	≥5 m	10° - 30°	87.5° - 177.5°	221, 321, 421	- All elevated areas with moderate slopes and aspects (ie sides of ridges). - Relief above 5 m would have little influence on vegetation structure and composition within the narrow range of elevations at CFSM. - Slope aspect on moderate slopes is likely to have some influence on exposure and is likely to influence vegetation structure and composition.
4	≥5 m	10° - 30°	177.5° - 267.5°	222, 322, 422	
5	≥5 m	10° - 30°	267.5° - 357.5°	223, 323, 423	
6	≥5 m	10° - 30°	357.5°-87.5°	224, 324, 424	
7	≥5 m	>30°	87.5°-177.5°	231, 331, 431	- All elevated areas with steep slopes and aspects (ie sides of ridges). - Relief above 5 m would have little influence on vegetation structure and composition within the narrow range of elevations at CFSM. - Slope aspect and steep terrain is likely to influence exposure and is likely to influence vegetation structure and composition.
8	≥5 m	>30°	177.5°-267.5°	232, 332, 432	
9	≥5 m	>30°	267.5°-357.5°	233, 333, 433	
10	≥5 m	>30°	357.5°-87.5°	234, 334, 434	

¹ Refer to **Table C** for landform characteristic classes used to generate landform element codes.

Table F: Plant functional group codes that are used to determine plant functional groups

Plant functional attribute	Range of possible traits	Plant functional group (PFG) code component ¹
Growth form	• Woody species (trees and shrubs) • Graminoids (grasses, sedges and rushes) • Forbs (including vines, ferns and epiphytes)	• W • G • F
Nutrient acquisition strategy	• Nitrogen-fixing (may also be mycorrhizal) • Specialised root systems (some graminoids) • Mycorrhizal associations only (for woody species and forbs) • Other	• N • S • M • -
Primary regeneration mode	• Seeder • Resprouter organ (rhizomes, corms, tubers, large woody subterranean organs) • Vegetative reproduction/dispersal	• 1 • 2 • 3

¹ For example, a plant species with a plant functional group code of WN1: has a woody species growth form (either a tree or a shrub), has a nitrogen-fixing nutrient acquisition strategy, and its primary reproduction mode is by seed.

Notes: Nutrient acquisition strategy identified with reference to Brundrett (2008), Lamont (1982) and MESA (1999-2015).

Brundrett, M 2008, *Mycorrhizal Associations: The Web Resource Version 2*, sponsored by Australian Centre for International Agricultural Research, Lotterywest and School of Plant Biology, The University of Western Australia, <<https://mycorrhizas.info/info.html>>.

Lamont, B 1982, Mechanisms for enhancing nutrient uptake in plants, with particular reference to mediterranean South Africa and Western Australia, *The Botanical Review*, 48: 597-689.

MESA 1999-2015, *Mangroves of Australia – Adaptations*, Marine Education Society of Australasia, <<http://www.mesa.edu.au/mangroves/mangroves02.asp>>.

Table G: Native plant framework species used in the original seeding and tubestock planting in areas rehabilitated before 2012

Growth form	Family	Species
Tree	Chrysobalanaceae	<i>Parinari nonda</i>
Tree	Combretaceae	<i>Terminalia muelleri</i>
Gramminoid	Cyperaceae	<i>Arthrostylis aphylla</i>
Gramminoid	Cyperaceae	<i>Fimbristylis cymosa</i>
Gramminoid	Cyperaceae	<i>Gahnia sieberiana</i>
Gramminoid	Cyperaceae	<i>Schoenus calostachyus</i>
Gramminoid	Cyperaceae	<i>Schoenus sparteus</i>
Forb	Dilleniaceae	<i>Hibbertia banksii</i>
Shrub	Ebenaceae	<i>Diospyros compacta</i>
Shrub	Ericaceae	<i>Leucopogon ruscifolius</i>
Shrub	Ericaceae	<i>Leucopogon yorkensis</i>
Tree	Fabaceae	<i>Acacia brassii</i>
Shrub	Fabaceae	<i>Acacia calyculata</i>
Tree	Fabaceae	<i>Acacia crassicarpa</i>
Shrub	Fabaceae	<i>Acacia humifusa</i>
Shrub	Fabaceae	<i>Acacia legnota</i>
Tree	Fabaceae	<i>Acacia platycarpa</i>
Shrub	Fabaceae	<i>Acacia pubirhachis</i>
Tree	Fabaceae	<i>Acacia racospermoides</i>
Shrub	Fabaceae	<i>Bossiaea arenicola</i>
Shrub	Fabaceae	<i>Labichea buettneriana</i>
Forb	Hemerocallidaceae	<i>Dianella caerulea</i>
Forb	Hemerocallidaceae	<i>Dianella longifolia</i> var. <i>longifolia</i>
Forb	Laxmanniaceae	<i>Lomandra banksii</i>
Vine	Menispermaceae	<i>Tinospora esiangkara</i>
Shrub	Myrsinaceae	<i>Myrsine porosa</i>
Shrub	Myrtaceae	<i>Asteromyrtus lysicephala</i>
Tree	Myrtaceae	<i>Corymbia intermedia</i>
Shrub	Myrtaceae	<i>Leptospermum polygalifolium</i>
Shrub	Myrtaceae	<i>Lithomyrtus obtusa</i>
Shrub	Myrtaceae	<i>Melaleuca arcana</i>
Shrub	Myrtaceae	<i>Melaleuca polandii</i>
Shrub	Myrtaceae	<i>Neofabricia myrtifolia</i>
Shrub	Myrtaceae	<i>Syzygium banksii</i>
Tree	Myrtaceae	<i>Syzygium forte</i> subsp. <i>forte</i>
Shrub	Myrtaceae	<i>Syzygium suborbiculare</i>
Shrub	Myrtaceae	<i>Thryptomene oligandra</i>
Shrub	Myrtaceae	<i>Xanthostemon arenarius</i>
Shrub	Picrodendraceae	<i>Neoroepera banksii</i>
Shrub	Picrodendraceae	<i>Petalostigma pubescens</i>

Growth form	Family	Species
Shrub	Proteaceae	<i>Grevillea glauca</i>
Shrub	Proteaceae	<i>Grevillea pteridifolia</i>
Shrub	Proteaceae	<i>Persoonia falcata</i>
Shrub	Putranjivaceae	<i>Drypetes deplanchei</i>
Gramminoid	Restionaceae	<i>Baloskion tetraphyllum</i> subsp. <i>meiostachyum</i>
Gramminoid	Restionaceae	<i>Dapsilanthus ramosus</i>
Shrub	Rubiaceae	<i>Psydrax odorata</i>
Shrub	Rutaceae	<i>Boronia alulata</i>
Shrub	Santalaceae	<i>Exocarpos latifolius</i>
Shrub	Sapindaceae	<i>Dodonaea polyandra</i>
Tree	Sapotaceae	<i>Manilkara kauki</i>
Shrub	Sapotaceae	<i>Sersalisia sericea</i>
Forb	Violaceae	<i>Hybanthus enneaspermus</i>

¹ This species list is to be used when assessing natural recruitment of plants into rehabilitation domains rehabilitated before 2012. Land rehabilitated before 2012 is shown on **Figure 2**.

Table H: Infrastructure to be retained for Hope Vale Owner Use as itemised in the Retained Infrastructure Deed¹

Disturbance category	Disturbance Type	Retained Infrastructure assets
Township (excluding landfill) and infrastructure	- Township - Old offices, workshop and store. - Quarry (current sand blasting area and pad) - New workshops, store and offices - Supply wharf area - Communications	- Concrete pads that are situated under the following: - Township - Workshop, offices, store and bunker - Blast yard - Administration office - Crib rooms - Abandoned fuel storage - Washdown bay (including oil/water separator) - Township buildings (including swimming pool and associated infrastructure) and Ellicott House - Hardstand lawns and garden areas - Old workshop (new shed behind Main Fuel Farm) - Water tanks - Fuel storage area - Supply wharf area - Service jetty and all associated infrastructure - Communications infrastructure - Administration office - Workshop - Stores buildings - Bunker
Access	Township access roads, fuel line and power lines	- Main township access roads including: - All township roads - Infrastructure access roads - Wharf and beach access roads - All roads leading to concrete pads, buildings and hardstand areas
	Mining access tracks to be retained	Main mining access roads including:

Disturbance category	Disturbance Type	Retained Infrastructure assets
		• Slurry Line road • Haul roads • Conveyer road for access north of the mine • Airport Lake and First Ridge rehabilitation access roads • All roads leading to concrete pads, buildings and hardstand areas
Infrastructure	Airstrip and associated infrastructure	16. Concrete pads that are situated under the following: • Airstrip and hanger 17. Airport building 18. Hardstand, lawns and garden areas
Infrastructure and Treatment Plant	• Main fuel farm • Sewage Treatment Plant (STP) • Water supply • Power house and fuel storage • Water pump, nursery, pipe shed, filter belt pad and laydown areas	19. Concrete pads that are situated under the following: • Reclaimer rails • Bucket wheel • Power screen • Nursery • Filter belt • Low Iron Plant • Old Mill • Motor Control Centre and transformers 20. Power house fuel storage 21. Main Fuel Farm 22. Sewage Treatment Plant 23. Power house 24. Crib room 25. Poly shed 26. Nursery 27. Water tanks 28. Hardstand, lawns and garden areas 29. Water supply 30. Water pump, pipe shed 31. Filter belt 32. Motor Control Centre 33. Laydown areas
Dams and Diversions	Arnie's Dam	34. Arnie's Dam (<i>Syn.</i> Arnie's Lake)
	Water diversions	35. Diversion channels ²
Treatment Plant (old)	Stockpile and mill outwash	36. Concrete pads that are situated under the following: • Reclaimer rails • Bucket wheel • Power screen • Filter belt • Low Iron Plant • Old Mill 37. Hardstand areas
Treatment Plant (new)	Process pond and new mill infrastructure	38. Concrete pads that are situated under the following: • New mill • Trommel • Water tanks • Constant Density Cone (CDC) • Water supply 39. Hardstand areas 40. Crib room

¹ Infrastructure for retention as nominated in the *Retained Infrastructure Deed* current as of 13th June 2019. In accordance with clauses 3.1 and 3.2 of the *Retention Infrastructure Deed (Variations to Retained Infrastructure)* between Hope Vale Congress Aboriginal Corporation and Cape Flattery Silica Mines Pty Ltd, the parties can agree to vary the list of Retained Infrastructure by adding additional items of infrastructure or removing items of infrastructure from that list. The parties agree that any variation to the Retained Infrastructure [list] must be: agreed by the AIC [Agreement Implementation Committee] in accordance with the processes set out in the Compensation Agreement (or otherwise agreed by the parties); and documented as a minute of the meeting at which the variation was agreed, upon with the terms of this Deed, as the case requires (*ie* apply to additional items of infrastructure **or** cease to apply to any items of infrastructure removed from the list of Retained Infrastructure).

² The diversions are channels between natural waterbodies that are not disturbed by other mining operations.

END OF PERMIT