ENVIRONMENT
An O2Marine company

Benthic Communities and Habitat Monitoring and Management Plan

Eramurra Solar Salt Project

ENVIRONMENT
An O2Marine company

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MARINE

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Acknowledgement Of Country

In the spirit of reconciliation, Leichhardt Salt Pty Ltd and O2 Marine Pty Ltd acknowledge that this project is proposed on the lands of the Mardudhunera People. We pay our respects to Elders past, present and emerging and recognise their continuing connection to land, sea, culture, and community.

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Version Register

Version	Status	Author	Reviewer	Comment	Authorised for release (signed and dated)
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Rev 0	Issued for Use	P Bouvais S Preston	A Gartner	Client Review	
Rev 1	Issued for Use	P Bouvais	A Gartner	Address client comments	
Rev 2	Issue for Use	J. Abbott	S. Preston	Address client comments	

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c. the above offences are punishable on conviction by imprisonment, a fine or both.

Signed: _____

Full name: _____

Organisation: Leichhardt Salt Pty Ltd_____

Document will be signed when issued as final.

EPBC Referral Number: 2018/8236

Name of Action Management Plan: This document and declaration refer to: the Eramurra Solar Salt Project: Benthic Habitat and Communities Monitoring and Management Plan.

Date: _____

Acronyms and Abbreviations

Term	Full term
%	Percentage
ANOVA	Multi-factorial Analysis of Variance
BACI	Before-After Control-Impact
BCH	Benthic Communities and Habitat
BCHMMP	Benthic Communities and Habitat Monitoring and Management Plan
BOM	Bureau of Meteorology
CC	Closed Canopy
CEO	Chief Executive Officer
CEMP	Construction Environmental Management Plan
cm	Centimetres
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Development
DSDPMMP	Dredge and Spoil Disposal Monitoring & Management Plan
DWER	Department of Water and Environmental Regulation
EMP	Environmental Management Plan
EnSTaR	EnSTaR Australia Ltd
EP Act	*Environmental Protection Act 1986* (WA)
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ERD	Environmental Review Document
ESSP	Eramurra Solar Salt Project
EVI	Enhanced Vegetation Index
GLM	Generalised Linear Model
GL	Gigalitres
GMMP	Groundwater Monitoring and Management Plan
GPS	Global Position System
ha	hectares

Term	Full term
HSE	Health, Safety, and Environment
IPCC	Intergovernmental Panel on Climate Change
km	Kilometres
LAU	Local Assessment Unit
LS	Leichhardt Salt Pty Ltd
LWC	Land & Water Consulting
m	Meters
m^3	Cubic metres
MCP	Mine Closure Plan
MEQMMP	Marine Environmental Quality Monitoring and Management Plan
mm	Millimetres
MS	Ministerial Statement
NASA	National Aeronautics and Space Administration
NDVI	Normalised difference vegetation index
NOAA	National Oceanic and Atmospheric Administration
OSRP	Oil Spill Response Plan
P	Statistical P-value
PAM	Pulse-amplitude modulated
PPA	Pilbara Ports Authority
ppt	Parts per thousand
Proposal	Leichhardt Salt Proposal for Eramurra Solar Salt Project
RGB imagery	Natural colour imagery (Red, Green & Blue)
RSMA	Regionally Significant Mangrove Area
RWL	Radar Water Level
SC	Scattered Canopy
SIPI2	Structure Intensive Pigment Index 2
WA	Western Australia
WAFIC	Western Australian Fishing Industry Council Inc
WAMSI	Western Australian Marine Science Institution

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1. Context, scope and rationale

1.1. Eramurra Solar Salt Project

Leichhardt Salt Pty Ltd (Leichhardt) is seeking to develop the Eramurra Solar Salt Project (the Proposal), a solar salt project east of Cape Preston, approximately 55 km west-south-west of Karratha in the Pilbara region of Western Australia (WA; Figure 1).The Proposal is an evaporative solar project that utilises seawater to produce raw salt as a feedstock for reprocessing to high purity salt. The Proposal aims for average annual production rates of 5.2 million tonnes per annum (Mtpa). To meet this production, the following infrastructure will be developed:

- Seawater intake, pump station and pipeline
- Concentration ponds totalling approximately 10,000 ha
- Crystallisers, totalling approximately 1,900 ha
- Drainage channels and bunds
- Process plant and product dewatering facilities
- Water supply (desalination plant)
- Bitterns disposal pipeline and outfall
- Pumps, pipelines, roads, and support buildings including offices and communications facilities
- Workshops and laydown areas
- Landfill, and
- Other associated infrastructure.

A general description of the of the Proposal is provided in Table 1, while the physical extent and Proposal content elements (e.g. development, action, activities or processes) are summarised in Table 2. The Proposal development envelopes are shown in Figure 2.

Table 1: Short Summary of the Proposal

Project Title	Eramurra Solar Salt Project
Proponent Name	Leichhardt Salt Pty Ltd
Short Description	Leichhardt Salt Pty Ltd (Leichhardt) is seeking to develop a solar salt project in the Cape Preston East area, approximately 55 kilometres (km) west-southwest of Karratha in Western Australia (WA) (the Proposal). The Proposal will utilise seawater and evaporation to produce a concentrated salt product for export. The Proposal includes the development of a series of concentration ponds, crystallisers and processing plant. Supporting infrastructure includes bitterns outfall, drainage channels, product dewatering facilities, desalination plant, pumps, pipelines, power supply, access roads, administration buildings, workshops, laydown areas, landfill facility, communications facilities and other associated infrastructure. The Proposal also includes dredging at the Cape Preston East Port and both offshore and onshore disposal of dredge spoil material.

The export of salt is proposed to be via a trestle jetty. The jetty and associated stockpiles will be located at the Cape Preston East Port as approved by Ministerial Statement (MS) 949. Dredging will be undertaken as part of this Proposal to remove high points at the Cape Preston East Port. Dredged material will either be disposed of at an offshore disposal location, or onshore within the Ponds and Infrastructure Development Envelope. The Cape Preston East Port jetty and associated stockpiles are excluded from the ESSP. The ESSP will produce a salt concentrate according to the following processes:

- Seawater will be pumped into the first concentration pond and commence progressive concentration by solar evaporation as it flows through successive concentration ponds.
- Salt is deposited onto a pre-formed base of salt in the crystallisers.
- Salt will be removed from the drained crystallisers by mechanical harvesters and stockpiled adjacent to the processing facilities.
- Cleaned Salt will be trucked to the trestle jetty approved by MS 949 for export, and
- A maximum of 5.9 GL of bitterns (at 410 ppt salinity) will be generated in any given year and up to 0.65 GL (at 410 ppt salinity) in a peak summer month. The bitterns will be diluted 1:1 volume ratio with local seawater prior to discharge via ocean outfall diffuser within the Marine Development Envelope.

The Proposal may be developed in its entirety, or the East concentration ponds may be developed at a later stage.

The location of the Proposal and development envelopes are displayed in Figure 1 and Figure 2, while Table 2 outlines the extent of the physical and operational elements of the ESSP.

Table 2: Location and proposed extent of physical and operational elements

Element	Proposed Extent
Physical Elements	
Pond and Infrastructure Development Envelope – Concentration ponds and crystallisers. Process plant, desalination plant, administration, water supply, intake, associated works (access roads, laydown, water supply and other services).	Disturbance of no more than 12,201 ha within the 20,160 ha Ponds Development Envelope.
Marine Development Envelope – Seawater intake and pipeline, dredge channel, bitterns pipeline, outfall diffuser and mixing zone.	Disturbance of no more than 53 ha within the 703 ha Marine Development Envelope.
Dredge Spoil Disposal Development Envelope – Disposal location for dredge spoil.	Disturbance of no more than 100 ha within the 285 ha Dredge Spoil Disposal Development Envelope.
Operational Elements	
Bitterns discharge	Discharge of up to 5.9 Gigalitres per annum (GL pa) of bitterns within a dedicated offshore mixing zone within the Marine Development Envelope
Dredge Volume	Approximately 400,000 m^3

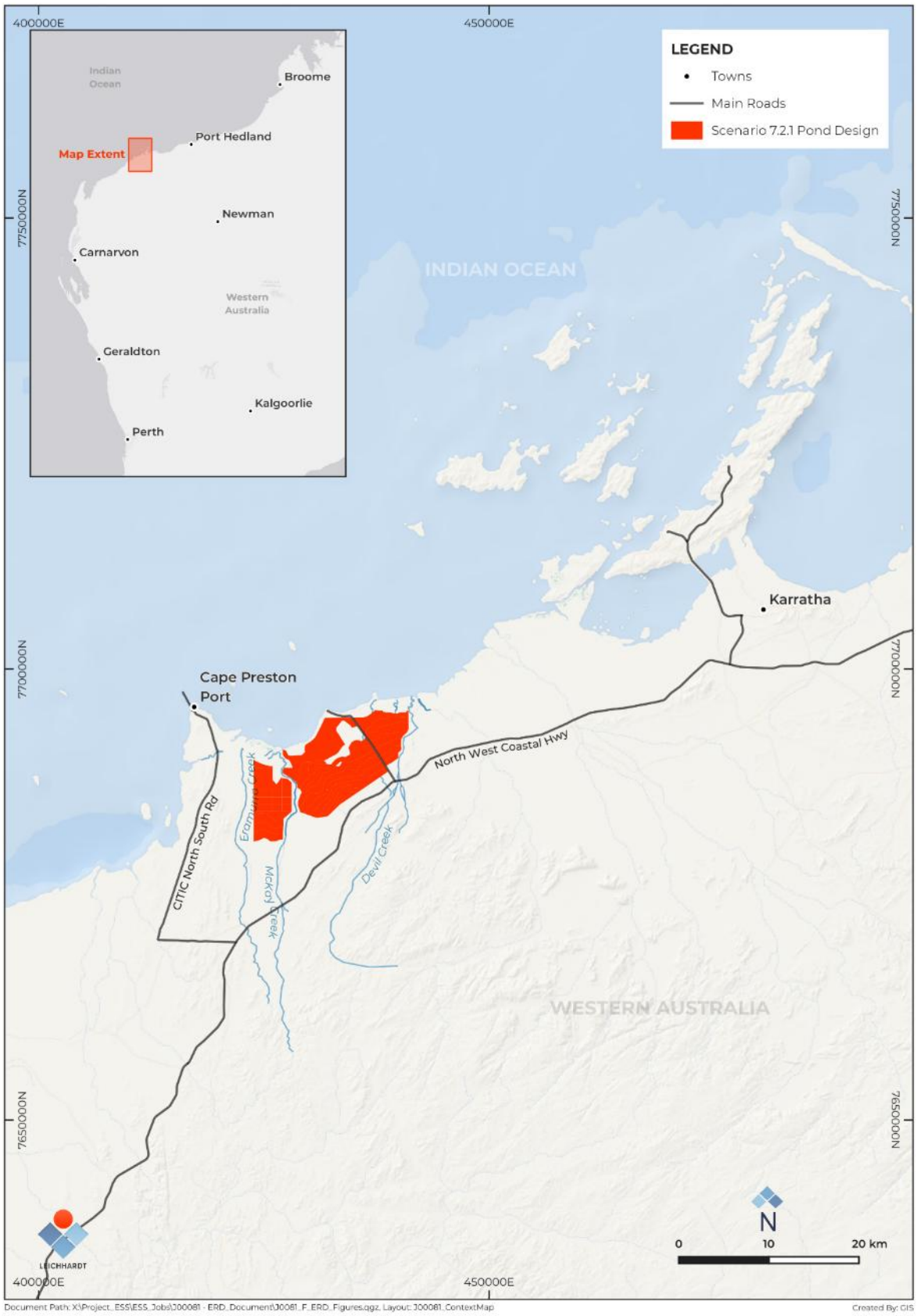

Figure 1: Regional location of the Proposal

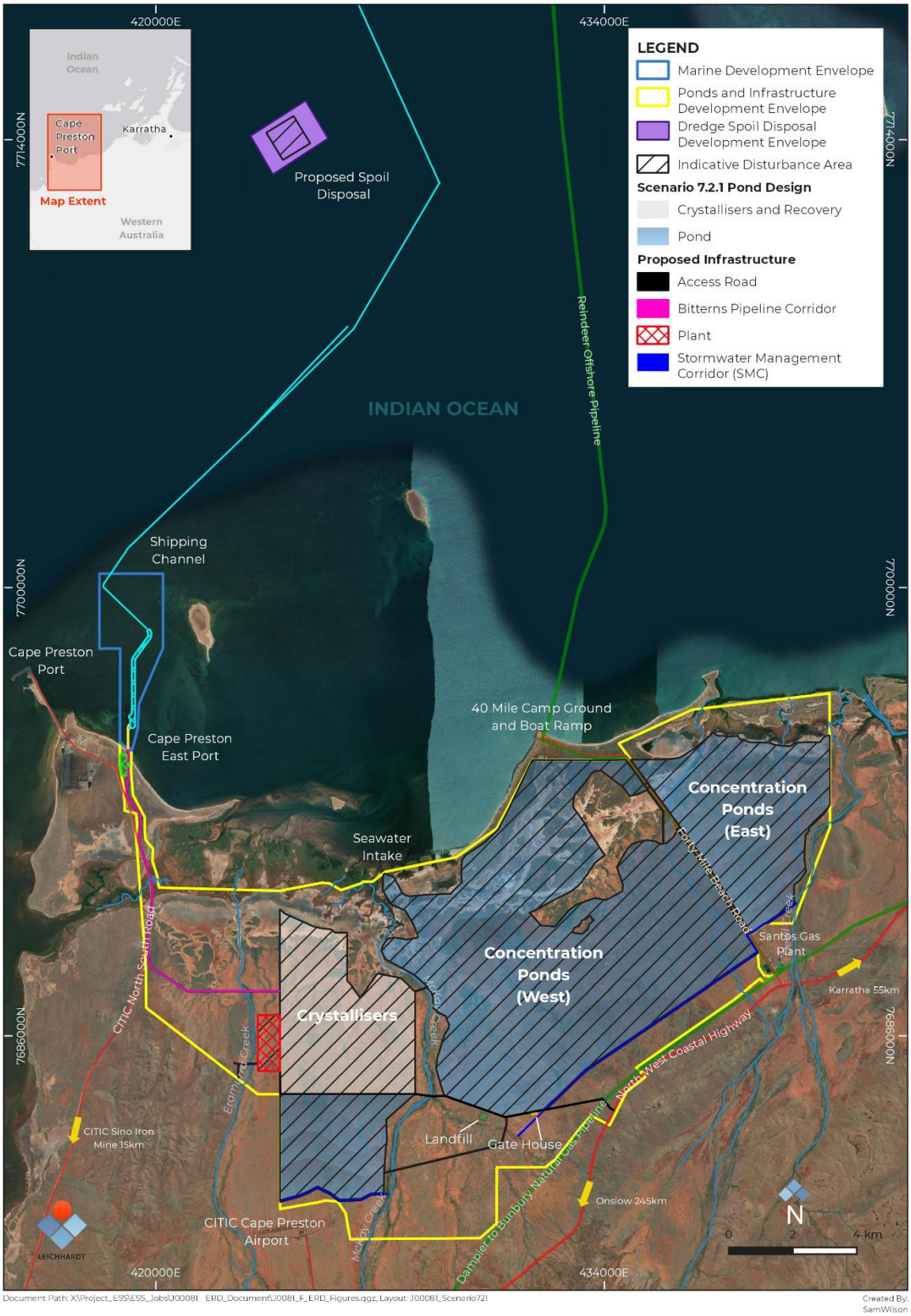

Figure 2: Development Envelopes

1.2. Purpose of this Management Plan

This BCH Monitoring and Management Plan (BCHMMP) provides monitoring and management measures to be implemented by LS to protect the health, abundance, and diversity of BCH. The BCHMMP has been prepared to demonstrate LS's commitment to achieving the EPA's objective for BCH, which is *to protect benthic communities and habitats so that biological diversity and ecological integrity are maintained* (EPA 2016a). Specifically, the plan:

1. Addresses the commitment of the Environmental Review Document to prepare a BCHMMP
2. Describes the process for baseline data acquisition and mapping for ongoing monitoring, and
3. Documents management and monitoring measures required for construction, operation, and closure, including defined trigger levels and adaptive management responses, to ensure residual impacts are not greater than predicted and achieve predicted outcomes/objectives.

A summary of the key outcomes and objectives for the ESSP BCHMMP is provided in Table 3.

Table 3: Summary of key outcomes and objectives for the ESSP BCHMMP

Key outcomes	Outcome 1: No direct impacts to subtidal or intertidal BCH outside of the designated impact areas as defined in the referred Proposal (ERD, Preston Consulting 2023). • The spatial extent of final direct impacts to BCH does not exceed the proposed maximum impact areas. • Clearing of mangroves, algal mats, or intertidal samphires is confined to the Proposal design footprint. • No change in the health, coverage extent, or species diversity of intertidal benthic communities beyond 100 m seaward of the pond walls, as illustrated in Figure 2. • Adverse impacts to intertidal benthic communities are limited to an area within 100 m of the pond wall defined in Figure 2. Outcome 2: No loss of subtidal or intertidal BCH beyond predicted indirect impact areas associated with the Proposal. • No decline in cover/density beyond the predicted indirect impact areas compared to reference sites. • No development that would have an adverse impact on the ecological function of intertidal and subtidal benthic communities and habitats • No development that would have an adverse impact on the ecological processes or habitats that sustain the bluespotted emperor (*Lethrinus punctulatus*) fishery.
Key Objectives	• Detect as early as possible changes to the health, diversity, and extent of BCH as a result of changes to surface water, groundwater quality, groundwater regimes, and marine environmental quality associated with the Proposal • Record and report loss of BCH as a result of the Proposal, including loss of health, abundance or diversity as a result of project-attributable indirect impacts • Address project-attributable adverse impacts to BCH (including subtidal macroalgae) using best-practice available management mitigation and contingency measures.

1.3. Expertise

This BCHMMP was developed by O2 Marine in consultation with leading ecologists and marine scientists from CDM Smith, Land & Water Consulting, Actis Consulting and Preston Consulting. In addition, leading ecologists such as Mark Coleman (Actis Consulting) have been engaged by LS to advise on intertidal ecology and have contributed to the content and methods presented in this BCHMMP.

1.4. Key environmental factors

The Proposal activities that may affect BCH and related disturbances are described in Table 4.

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cwth) and Western Australian *Environmental Protection Act 1986* (EP Act) govern the environmental approval process. This process aims to support environmentally sustainable development while protecting environmental values. Benthic Communities and Habitat (BCH) is a key environmental factor to be considered during environmental impact assessment under Part V of the EP Act (WA).

The EPA's objective for BCH is "*to protect benthic communities and habitats so that biological diversity and ecological integrity are maintained*". The scope of this document is to describe the monitoring and management measures to be implemented by LS during the construction and operation of the ESSP to ensure that residual impacts to BCH are minimised.

The EPBC Act is managed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and covers nine protected matters, including nationally significant animals, plants, habitats, and places. Relevant to this BCHMMP, listed Threatened species, ecological communities, migratory species, and marine species of significance are considered in the development of the Proposal. EPBC 2018/8236 recognises the importance of protecting BCH to minimise impacts on migratory shorebirds and marine fauna.

Table 4: Proposal activities that may affect BCH

Activities	Direct disturbance to BCH	Indirect impacts to intertidal and supratidal BCH	Indirect impacts to subtidal BCH

• Construction and operation of:
  • seawater intake pipeline(s)
  • bitterns discharge infrastructure (may include channel, pipeline and dilution pond)
  • access roads, laydown
  • concentration and crystalliser ponds, salt processing plants, desalination plant, administration, accommodation camp
• Discharge of bitterns and other wastewater
• Dredging activities and offshore disposal
	Direct loss of approximately 1,288.4 ha of intertidal BCH and 24.6 ha of subtidal BCH.	• Introduction of marine pests;
		• Indirect impacts associated with changes to water quality, including:
		  • Increased sedimentation resulting in settlement and smothering of habitat;
		  • Alteration to surface water regimes;
		  • Changes to the dynamics of nutrient flows and budgets;
		  • Leaks or spills of hydrocarbons or chemicals;
		  • Leaks or spillages of hypersaline brine; and
		  • Potential movement of hypersaline groundwater as a result of hydrostatic pressure of the brine
			• Introduction of marine pests;
			• Indirect impacts associated with changes to water quality, including:
			  • Increased sedimentation
			  • resulting in settlement and
			  • smothering of habitat;
			  • Leaks or spills of hydrocarbons or chemicals; and
			  • Bitterns disposal (salinity) at discharge location.

1.5. Scope and association with other management plans

This BCHMMP is designed to align with other environmental management plans (EMPs) as identified in the Proposal ERD (Preston Consulting 2023). A summary flowchart of the relevant monitoring and management plans is presented in Figure 3. This BCHMMMP provides monitoring and management actions for BCH impacts, except for monitoring and management actions associated with:

- Dredging activities, which are covered in the Dredging Spoil and Disposal Monitoring and Management Plan (DSDMMP)
- Bitterns disposal, which is covered in the Marine Environmental Quality Monitoring and Management Plan (MEQMMP).
- Groundwater seepage and mounding which is covered in the Groundwater Monitoring and Management Plan (GMMP)
- Construction activities which are covered in the Construction Environmental Management Plan (CEMP)
- Mine closure, which is covered in the Mine Closure Plan (MCP).

The GMMP provides monitoring and management actions related to groundwater seepage and mounding, which provide early warning trigger criteria that will trigger implementation of BCH monitoring actions presented in this BCHMMP (Section 2.2). Outcomes established in the GMMP relating specifically to BCH are:

No changes to the health, extent or diversity of intertidal benthic communities and habitat, including mangrove, coastal samphire, and algal mat as a result of changes to groundwater regimes or groundwater quality associated with the proposal.

Response actions to trigger criteria exceedances under the GMMP include the implementation of relevant management actions established in this BCHMMP, including enhanced monitoring in potentially affected areas, with feedback to GMMP management actions. Similarly, investigations into trigger and threshold exceedances under this BCHMMP will include a review of monitoring data collected under the GMMP, and the implementation of additional monitoring if required.

The scope of other plans related to the BCHMMP are as follows, however do not directly trigger revisions or updates to the BCHMMP:

- The CEMP provides the framework for the management of environmental aspects and impacts during the construction phase of the Project
- The MEQMMP provides monitoring and management actions relating to bitterns discharge and is relevant to operational aspects of the Project. Exceedances may trigger a review of monitoring data collected under the BCHMMP.
- The DSDMMP provides monitoring and management actions where the residual risk of contamination to groundwater and intertidal BCH will be assessed and addressed in the GMMP and BCHMMP if required. The risk to subtidal BCH from dredging related impacts is the primary focus of this plan.

The monitoring data collected through the BCHMMP will inform the future implementation of a Mine Closure Plan.

Several other management plans are also developed, including Marine Pests and Illumination, however, are not directly related to BCH and have not been included in this BCHMMP.

Marine fauna are excluded from the scope of this BCHMMP. Observations of dead or injured wildlife made during the implementation of the monitoring program will be reported through the LS Incident Reporting System and Fauna Management Procedure.

The management of leaks or spills of hydrocarbons, chemicals or hypersaline brine are defined within the Oil Spill Response Plan (OSRP), established in consultation with the Pilbara Ports Authority (PPA). This plan will be managed under PPA requirements, the *Mining Act 1978* (Mining Act) and Part V of the EP Act and therefore has not been included in this BCHMMP.

An adaptive management approach will ensure ESSP achieves constant improvement in environmental results and management practices throughout the implementation of the Project (Section 4).

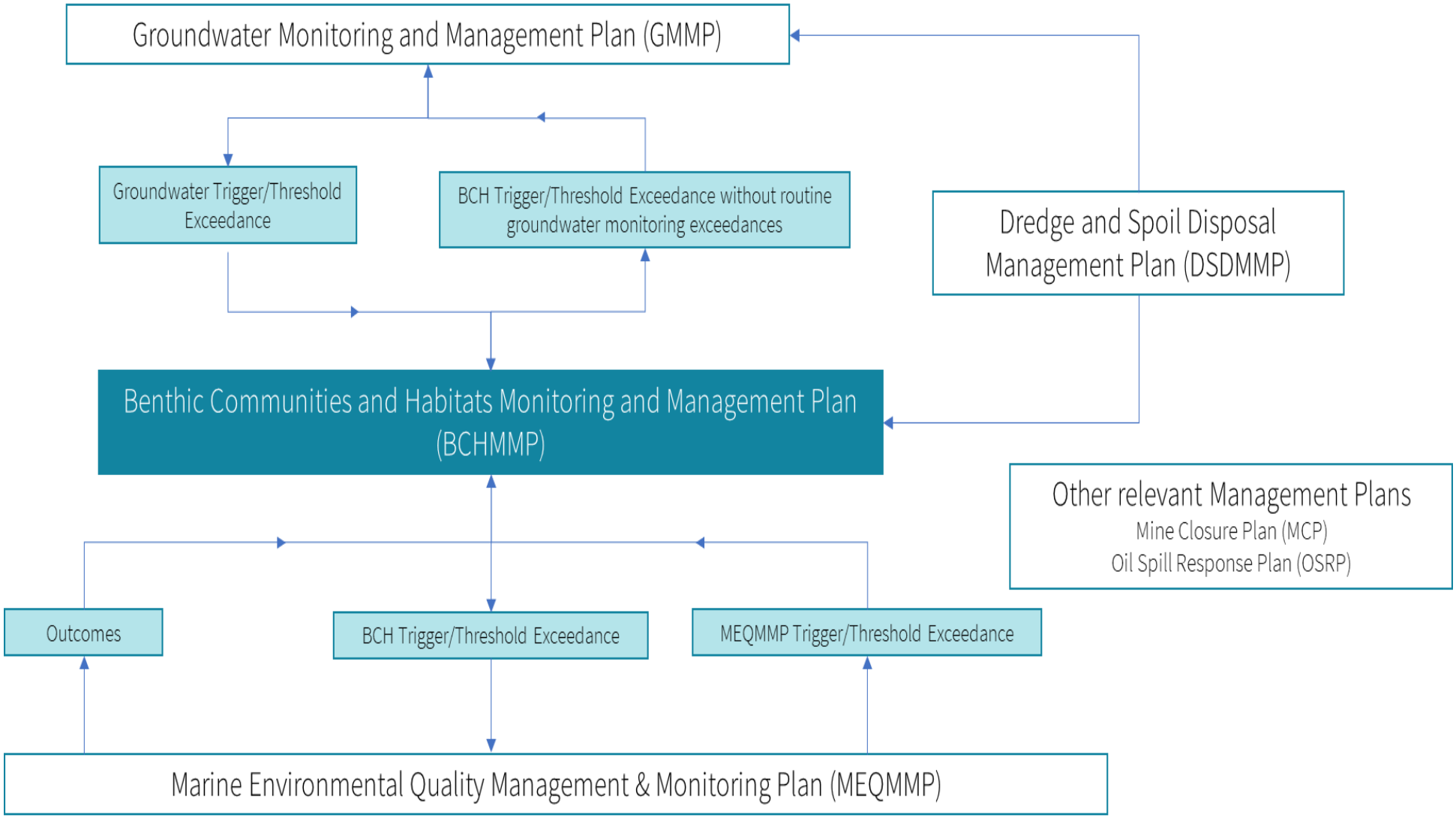

Figure 3: Summary flowchart of relevant monitoring and management plans

1.6. Condition requirements

The Ministerial Statement for the Proposal has not yet been issued; therefore, this section will be completed once the conditions are released.

1.7. Rationale and approach

The LS management approach used in this BCHMMP is to emphasise managing impacts through planning, organisation and controlling aspects of the Proposal during construction and operation. In accordance with EPA (2016b), a hierarchical approach to manage potential impacts from the Proposal has been used:

- Avoidance: measures used to avoid or prevent impacts from the Proposal
- Minimisation: measures taken to reduce the duration, intensity and/or the extent of impact.
- Rehabilitate: measures taken at the completion of the Proposal to reinstate BCH where appropriate.

Results from surveys, study findings, and the Environmental Review Document inform this management approach.

1.7.1. Relevant environmental values

Several surveys and studies have been undertaken to assess BCH within the Proposal study areas. Historical survey efforts and detailed descriptions of existing environmental features are presented in Appendix A.

Overall, studies confirmed the importance of the ecological functions delivered by intertidal BCH. O2 Marine (2025a) found that the intertidal area was dominated by mudflats / algal mats, making up 14.9% of the study area. Other BCH with substantial coverage included mudflats (13.2%), mangroves (7.7%) and samphire shrublands (7.5%). The seaward BCH communities (i.e., closed canopy (CC) and scattered canopy (SC) mangroves and seaward mudflats) present, were the most ecologically valuable communities within the Local Assessment Units (LAUs).

Based on the collected information on the functional ecological significance of BCH for the ESSP, the key environmental values relevant to this BCHMMP include:

- Mangrove communities (1,311 ha)
- Mudflat / Algal mat habitats (3,000 ha)
- Samphire shrublands (415 ha)
- Samphire shrublands with algal mat (1,007 ha)

While risks to marine subtidal communities as a result of the Proposal are predicted to be minimal, subtidal BCH will still be monitored to account for any uncertainty in the impact assessment and to ensure that they remain protected. Subtidal BCH monitoring is to occur at nearshore locations adjacent to the development envelope susceptible to potential changes to surface water, groundwater quality groundwater regimes, and marine environmental quality. The dominant subtidal BCH in the nearshore zone is seagrass. It is for this reason that seagrass is considered a more suitable BCH type to monitor than other sub-tidal BCH types, such as macroalgae, which has very low cover due to a lack of hard substrate to colonise.

1.7.2. Key assumptions and uncertainties

The indirect BCH impacts of the Proposal associated with hydrological changes are principally based on two modelling investigations:

- LWC (2023a) Eramurra Solar Salt Project: Hydrologic Assessment. Report prepared by Land and Water Consulting for Leichhardt Salt Pty Ltd.
- LWC (2023b) Eramurra Solar Salt Project: Groundwater Effects Assessment and Seepage Modelling. Report prepared by Land and Water Consulting for Leichhardt Salt Pty Ltd.

Both models use several key assumptions, which include:

- Soil permeability and seepage rates
- Groundwater flow rates
- Surface water runoff volumes and flow rates during rainfall events
- Tidal inundation flow paths
- Sea level rise estimates.

This BCHMMP and other associated management plans will include verification of these model assumptions.

The in-situ monitoring methodology for mangrove health assessments is well established, however algal mat and samphire habitat methodology is less certain. The BCHMMP has been developed to ensure multiple lines of evidence and sufficient levels of replication to mitigate uncertainty.

No additional assumptions and uncertainties have been identified.

1.7.3. Rationale for choice of provisions

The rationale for the choice of provisions is based on implementing an outcome-based management approach to avoid and minimise the potential impacts of the Proposal on BCH.

This Plan also describes the monitoring and reporting approach that will be undertaken to assess the effectiveness of the management actions in meeting the environmental outcomes.

Two levels of indicators are used in this plan; a) criteria relating to trigger levels and b) criteria relating to threshold levels (Figure 4).

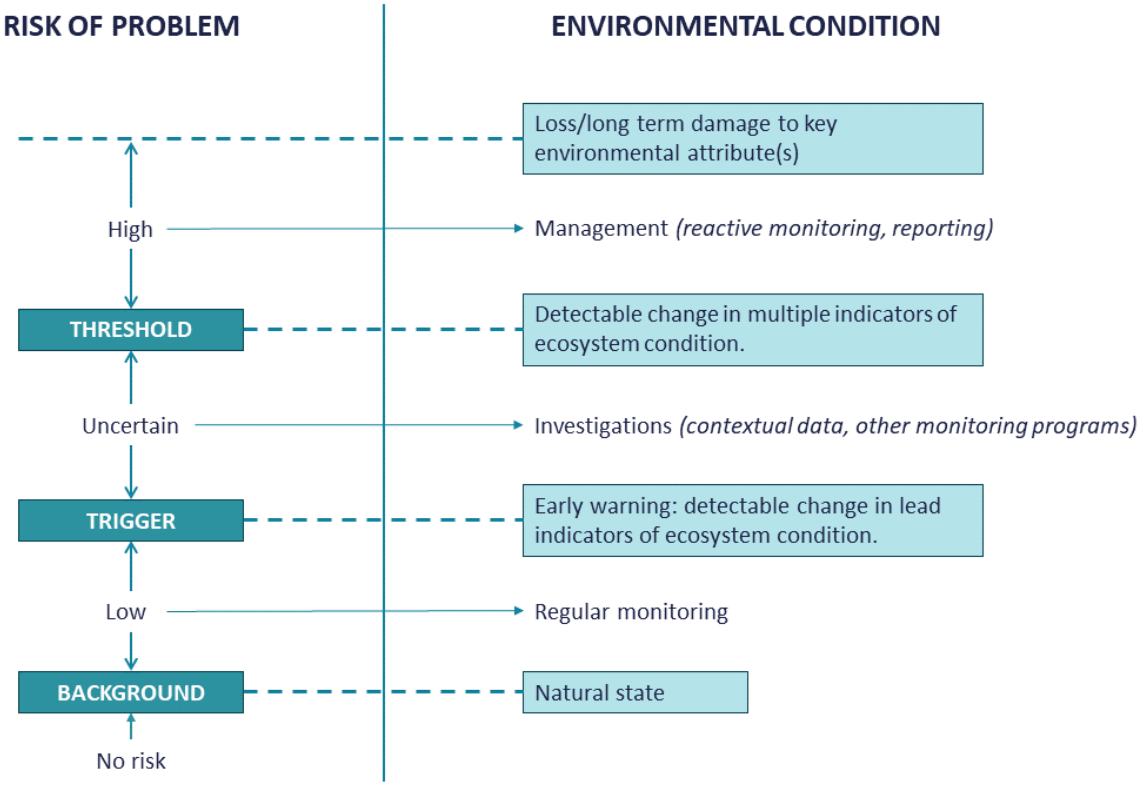

Figure 4: Summary of indicator levels implemented in the BCHMMP.

Management Targets[1], Management Actions[2], Trigger Criteria[3], Threshold Criteria[4], and Threshold Contingency Actions[5] have been selected to ensure the construction and operation of the Project aligns with the environmental outcomes described in Table 3. Where relevant, triggers, Threshold Criteria, and Management Actions detailed in the GMMP, DSDMMP and MEQMMP will be used as early warning indicators to identify and prevent corresponding impacts to BCH requiring remediation/non-compliance reporting. Concomitantly, a combination of baseline information and control sites will be used to determine if trigger or threshold exceedance are due to natural events, or because of the Proposal.

[1] A type of indicator that is defined to demonstrate that the objective is being met.
[2] The identified actions implemented to meet the environmental objective.
[3] Indicators that have been selected for monitoring to provide a warning that if exceeded the outcome/objective may not be achieved. They are intended to forewarn of the approach of the threshold criteria and trigger response actions.
[4] The indicators that have been selected to represent the limit of acceptable impact beyond which the environmental outcome is not being met and where there is likely to be a significant impact on the environment.
[5] The planned actions for implementation if threshold criteria are exceeded. Threshold contingency actions must be decisive actions that will quickly bring the impact to below the threshold criteria and trigger criteria.

The Management Actions presented in this BCHMMP have been designed according to the following rationale:

1. Trigger Criteria are used, based on the physical monitoring and management of impacting influences. For example, the monitoring of hydrological changes should trigger early Management Actions rather than rely on the results of BCH monitoring.
2. Management Actions allow for expected changes to the environment (such as sea level rise) or possible effects of issues external to the Proposal.
3. Threshold Contingency Actions are chosen that will have an appropriate timeframe to take effect.

The indicators for each BCH type have been selected to provide multiple lines of evidence to determine and interpret potential triggers or threshold exceedance. Percent cover will be calculated for all intertidal BCH, though different methods will be adopted to allow for the different heights in species and habitat types. This is considered the most reliable indicator of health within all communities. Further information such as chlorophyll-a concentrations, or spatial extent using remote sensing imagery will also be monitored as additional lines of evidence. The specific methods to be used for each indicator are described in detail in Section 0.

1.7.4. Outcomes-based management actions summary

The BCHMMP has been prepared to demonstrate LS's commitment to achieving EPA's objective for BCH, which is "*to protect benthic communities and habitats so that biological diversity and ecological integrity are maintained*" (EPA 2016a).

The key environmental values relevant to this BCHMMP include:

- Intertidal BCH including mangrove communities, algal mat habitat and samphire, and
- subtidal BCH including seagrass and macroalgae.

The key impacts and risks related to this BCHMMP are:

- Loss of up to 1,887 ha of intertidal BCH, including up to 7.9 ha of mangrove habitats, 1,033.7 ha of algal mat habitats and 210.8 ha of coastal samphire
- Indirect impact associated with changes to salinity and hydrological regimes due to the design of pond walls and /or saline spillage of seepage.

From this, the ESSP BCHMMP will be implemented to achieve the following environmental outcomes:

Outcome 1: No direct impacts to subtidal and intertidal BCH that exceed the maximum impact areas associated with the Proposal.

- The extent of final direct impacts to BCH does not exceed the proposed maximum impact areas.
- Clearing of mangroves, algal mats or intertidal samphire does not occur outside of the Proposal design footprint.
- No adverse impacts or change in the health, extent of coverage, or species diversity of intertidal benthic communities more than 100 m seaward of the pond walls.

Outcome 2: No adverse impact on subtidal and intertidal BCH outside the predicted indirect impact areas associated with the Proposal.

- No decline in cover/density outside the predicted indirect impact areas that are greater than reference sites.
- No development that would have an adverse impact on the ecological function of intertidal and subtidal benthic communities and habitats.
- No development that would have an adverse impact on the ecological processes or habitats that sustain the bluespotted emperor (*Lethrinus punctulatus*) fishery.

Table 5 presents a summary of the triggers, thresholds and associated responses and other actions to be undertaken if there is an exceedance. If a trigger is exceeded, further modelling will be conducted to understand the most suitable management action. This modelling may include the following:

- Surface water modelling:
  - Undertake surface water modelling to determine alternative diversions, trenching or drainage alternatives to reinstate natural conditions to prevent further decline of BCH, and to facilitate recovery of ecosystem.
- Tidal inundation
  - Undertake tidal inundation modelling water modelling to determine alternative diversion, trenching or drainage to reinstate natural conditions to prevent further decline of BCH, and to facilitate recovery of ecosystem.
- Groundwater
  - Undertake groundwater modelling to run scenarios for reducing groundwater mounding or salinity levels, including but not limited to:
    - Installation of recovery bores to pump water away from impacted areas and reduce water or salinity levels.
    - Trenching to capture mounding and either allow evaporation to lower the water levels or pump to an equivalent salinity pond.
    - Installation of additional groundwater sampling bores if required to better understand the impacts and management.
    - Implement the most suitable corrective actions as determined by the modelled scenarios.

Depending on the results of the modelling, ecosystem restoration may also be considered to rehabilitate the sites.

Table 5: Outcomes-based management actions summary

BCH • Trigger Criteria • Trigger Thresholds	Response actions • Trigger level actions • Threshold contingency actions	Monitoring	Timing/frequency of actions	Reporting
Algal Mats **Trigger criteria** Retain a minimum of 80% baseline algal mat percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data. **OR** Retain a minimum of 85% baseline total Field Nett Productivity (t C yr-**1**) calculated over three samples within the same site over time and, is not significantly different ($p<0.05$) from the changes in reference site data. **Threshold** Retain a minimum of 50% baseline algal mat percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data **AND** Retain a minimum of 70% baseline total Field Nett Productivity (t C yr-**1**) calculated over three samples within the same site over time and, is not significantly different ($p<0.05$) from the changes in reference site data.	Trigger level actions Investigate the cause of impact, to be undertaken within one month of the detection of the exceedance. This includes referring to surface water and tide data, weather conditions and groundwater monitoring data. Implement modelling if required and recommended actions from the modelling results. Threshold contingency actions Investigate the cause of impact, undertake further monitoring/modelling or data analysis as required and implement recommended actions based on the modelling. Review groundwater monitoring outcomes and implement additional monitoring as required and prepare a Management Action Plan as described in Section 3.2.	Groundwater, surface water and tide monitoring will continue to aid the investigation, and algal mat reactive monitoring will be undertaken at the sites of the exceedance to investigate further	Investigate within one month of the detection of the exceedance. Reactive monitoring to be undertaken at the next practical opportunity, considering tidal and inundation conditions.	Refer to Section 3.1 for exceedance regulatory reporting.
Mangroves Trigger A minimum of 80% baseline canopy cover retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data OR No significant increase in the average number of dead adult mangroves baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data OR No significant decrease in the average number of seedlings/saplings counted baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data Threshold A minimum of 50% baseline canopy cover retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data AND No significant increase in the average number of dead adult mangroves from baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data AND No significant decrease in the average number of seedlings/saplings counted from the baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data	Trigger level actions Investigate the cause of impact, to be undertaken within one month of the detection of the exceedance. This includes the evaluation of complementary health indicators (e.g. mortality, number of saplings and seedlings), other data collected during surveys and information collected from other EMPs (e.g.., GMMP), referring to surface water and tide data, weather conditions and groundwater monitoring data. Implement modelling if required and recommended actions from the modelling results. Threshold contingency actions Investigate the cause of impact, undertake further monitoring/modelling or data analysis as required and implement recommended actions based on the modelling. Review groundwater monitoring outcomes and implement additional monitoring as required and prepare a Management Action Plan as described in Section 3.2.	Groundwater, surface water and tide monitoring will continue to aid the investigation, and reactive monitoring will be undertaken at the sites of the exceedance to investigate further.	Investigate within one month of the detection of the exceedance. Reactive monitoring to be undertaken at the next practical opportunity, considering tidal and inundation conditions.	Refer to Section 3.1 for exceedance regulatory reporting
Mangroves (RSMA #9)				

BCH • Trigger Criteria • Trigger Thresholds	Response actions • Trigger level actions • Threshold contingency actions	Monitoring	Timing/frequency of actions	Reporting
Trigger A minimum of 90% baseline canopy cover retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **OR** No significant increase in the average number of dead adult mangroves from the baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **OR** No significant decrease in the average number of seedlings/saplings counted from the baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data Threshold A minimum of 80% baseline canopy cover retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **AND** No significant increase in the average number of dead adult mangroves from baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **AND** No significant decrease in the average number of seedlings/saplings counted from the baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data.				
Samphire **Trigger criteria** Retain a minimum of 80% baseline samphire percent cover at each site and any loss is not significantly different ($p<0.05$) from the rate of change in reference site data **OR** No significant increase in the average plant health scores (i.e. decline in overall health) over three plots at the same site and is not significantly different ($p<0.05$) to the changes in reference site data. Threshold Retain a minimum of 50% baseline samphire percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) to the changes in reference site data **AND** No significant increase in the average plant health scores (i.e. decline in overall health) over three plots at the same site and is not significantly different ($p<0.05$) to the changes in reference site data	Trigger level actions Investigate the cause of impact, to be undertaken within one month of the detection of the exceedance. This includes the evaluation of complementary health indicators (e.g., overall plant health), other data collected during surveys and information collected from other EMPs (erg., GMMP), referring to surface water and tide data, weather conditions and groundwater monitoring data. Implement modelling if required and recommended actions from the modelling results. Threshold contingency actions Investigate the cause of impact, undertake further monitoring/modelling or data analysis as required and implement recommended actions based on the modelling. Review groundwater monitoring outcomes and implement additional monitoring as required and prepare a Management Action Plan as described in Section 3.2.	Groundwater, surface water and tide monitoring will continue to aid the investigation, and reactive monitoring will be undertaken at the sites of the exceedance to investigate further.	Investigate within one month of the detection of the exceedance. Reactive monitoring to be undertaken at the next practical opportunity, considering tidal and inundation conditions.	Refer to Section 3.1 for exceedance regulatory reporting.
Subtidal monitoring **Trigger criteria**	Trigger level actions	Groundwater, surface water and tide monitoring will continue to aid the	Investigate within one month of the detection of the exceedance.	Refer to Section 3.1 for exceedance

BCH • Trigger Criteria • Trigger Thresholds	Response actions • Trigger level actions • Threshold contingency actions	Monitoring	Timing/frequency of actions	Reporting
Retain a minimum of 80% baseline subtidal BCH percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data. **Threshold** Retain a minimum of 50% baseline subtidal BCH percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data.	Investigate the cause of impact, to be undertaken within one month of the detection of the exceedance. This includes referring to surface water and tide data, bittern disposal, weather conditions and groundwater monitoring data. Implement modelling if required and recommended actions from the modelling results. Threshold contingency actions Investigate the cause of impact, undertake further monitoring/modelling or data analysis as required and implement recommended actions based on the modelling. Review groundwater monitoring outcomes and implement additional monitoring as required and prepare a Management Action Plan as described in Section 3.2.	investigation, and reactive monitoring will be undertaken at the sites of the exceedance to investigate further.	Reactive monitoring to be undertaken at the next practical opportunity, considering tidal conditions.	regulatory reporting.
Aerial survey (Mangroves, Samphire and Algal Mat)	To be established once the baseline is completed.			

1.8. Implementation Strategy

1.8.1. Roles and responsibilities

LS and their Contractors will assign suitable resources to oversee the management and implementation of the BCHMMP. Key roles and responsibilities are summarised in Table 6.

Table 6: Roles and responsibilities of key personnel for implementing the BCHMMP

Role	Key Responsibility
Leichhardt Salt Manager – Environment & Approvals	• Liaise with regulatory authorities as required • Manage the review of this BCHMMP as necessary and manage change requests • Approve proposed responsive or contingency management actions to be implemented in the event of an exceedance • Monitor and close out corrective actions identified during environmental monitoring or audits
Senior Site Executive (s)	• Comply with the requirements set out in this BCHMMP and other relevant plans • Liaise with contractors to ensure communication and understanding of environment requirements as outlined in this BCHMMP. Ensure all site personnel are aware of their responsibilities set out in relevant management plans and procedures • Oversee HSE inspections, audits, and investigations • Review reporting on HSE non-compliances and incidents
Site Environment Advisor	• Verify relevant Environmental Approvals for the activities that exist prior to commencing • Review and approve the Contractor's HSE plans • Assist with the review, investigation and reporting of environmental incidents • Ensure environmental monitoring and inspections/audits are undertaken as per the requirements of this BCHMMP • Liaise with relevant regulatory authorities as required • Perform external reporting of any environmental incidents/events • Monitor and close out corrective actions identified during environmental monitoring or audits • Provide advice to relevant LS personnel and Contractors to assist them in understanding their environmental responsibilities • Oversee implementation of the BCHMMP in the field • Participate in health, safety and environment (HSE) inspections and audits • Participate in HSE incident investigations
Contractors	• Comply with the requirements set out in this BCHMMP and other relevant plans

	• Manage the activity so it is undertaken as per the relevant standards and commitments in this BCHMMP • Ensure all Construction personnel are aware of their responsibilities through an induction program • Investigate and propose effective responsive or contingency management actions for implementation, where required • Implement responsive or contingency management action on direction from LS • Participate in HSE inspections, audits and investigations • Report on HSE non-compliances and incidents • Ensure personnel are competent to undertake the work they have been assigned • Ensure equipment is appropriately maintained and operated to prevent risk of environmental incidents • Establish and maintain clear communication with LS
Monitoring Contractor	• Implement the BCH monitoring program as described in Section 3 • Ensure all Monitoring personnel are aware of their responsibilities through an induction program • Develop HSE Plans for approval by LS personnel • Participate in HSE inspections, audits and investigations • Report on HSE non-compliances and incidents • Ensure equipment is appropriately maintained and operated to prevent risk of environmental incidents • Establish and maintain clear communication with LS

1.8.2. Training and competency

To ensure personnel understand their responsibilities and expectations in relation to environmental management, training and awareness will occur continuously throughout the life of the Project.

All project personnel attending the site will be subject to a Company and Project Site Induction which includes relevant environmental information such as:

- Weed control and washdown procedures.
- Ground disturbance and topsoil management
- Fauna management
- Incident notification and procedures
- Waste management
- Spill responses procedures, and
- Aboriginal heritage awareness.

An induction and training register will be used to record and monitor induction attendance by all personnel. The Contractor(s) will be required to ensure that environmental issues and the requirements of the BCHMMP are adequately communicated to the work teams. Examples of methods/forums which could be used include but are not limited to:

- Project kick-off meetings
- Daily pre-start meetings
- Tool-box meetings
- Noticeboards, and
- Environment alerts.

The Contractor(s) will be required to keep records of the above (as applicable) for review by LS on request.

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2. Monitoring program components

The BCH monitoring program has been designed to achieve the initial monitoring and management objectives and outcomes outlined in Section 1.2 and Table 3. The monitoring program will consist of health monitoring using field techniques to evaluate changes to the condition and abundance of BCH at the local scale at nominated monitoring sites. Tidal inundation and surface water level monitoring will also be carried out to provide information relevant to the relationship between hydrological changes and BCH health and distribution. If declines in health are detected at a local scale, then monitoring will then proceed to investigate potential changes across broader scales. The spatial extent in BCH will be investigated using remote sensing techniques to provide additional lines of evidence to understand broad-scale changes over the Project site. A summary of the monitoring program is proved in Table 7, and each part is detailed in the following sections (Sections 2.4 to 2.9).

Intertidal monitoring locations have been determined based on the risk of impacts and to represent the different habitat assemblages identified within the LAUs, and reference areas East and West. As such, the current monitoring design is considering:

- Intertidal BCH distribution extending landward from the coastal shoreline.
- Capacity to detect changes to surface water and groundwater levels associated with the Proposal as early as possible (prior to ecological impacts on BCH).

Transect lines have been established across the project area to indicate groundwater, surface water and tidal inundation patterns. Where possible, gradient transects intersect numerous intertidal BCH types. Monitoring sites are then established along the transect to detect changes in site-specific BCH health and extent. The start and end points of each transect are summarised in Table 8.

Subtidal monitoring locations have also been determined based on these risks and the ability to collect enough data to be statistically robust. The monitoring sites are also presented in Section 2.7.2.

As outlined in Section 1.5, this monitoring plan is also being undertaken concurrently with other management plans, which will be used to inform the analysis of results from the BCHMMP or trigger reactive monitoring or management actions. A summary flowchart for this process is given in Figure 3.

Table 7: A summary of the BCHMMP monitoring program and different methods applied

BCH type	Methods / Monitoring program components	Parameters / Indicators	Location of monitoring sites	Frequency + other monitoring conditions
Algal mats	**Algal Health Monitoring** • Establish 10 monitoring sites (including 2 reference sites) along 10 intertidal gradient transects (considering groundwater, surface water and tidal inundation patterns). • Survey three belt transects each comprising 16 quadrats (1 x 1 m) at each location. **Algal Mat Spatial Survey** • Georeferenced aerial imagery will be captured within a 200 m x 200 m survey area, at each site, to monitor. the spatial extent of samphire **Data Analysis** • Calculate the average percentage cover, the total Field Nett Productivity, dormancy and distribution across each site. • Compare results with baseline data and pre-disturbance surveys. • Assess impact sites against trigger and threshold criteria	• Percent cover • Hydrated Chlorophyll a • Dormancy • Colour • Texture	Intertidal LAUs (1 to 4) 10 impact and 2 reference sites	• Quarterly for one (1) year prior to construction • Biannual routine health monitoring (at the end of the dry and the wet seasons) from construction commencing. • Routine aerial survey data will be collected quarterly for the first two years, reducing to biannually (end of wet and dry season) if no impacts are detected, for a further two years, then annually. • Reactive monitoring in response to a qualifying event
Mangrove	**Mangrove Health Monitoring** • Establish 16 monitoring sites (including 4 reference sites) along 8 intertidal gradient transects (considering groundwater, surface water and tidal inundation patterns). • Survey three 8 x 8 m replicate quadrats at each location, with five random 1 x 1 m plots in each quadrat for fine-scale detail. Closed canopy quadrats will be 4 x 4 m.	• Canopy cover • Mangrove density, diversity and height • Stem diameter beast height • Chlorophyll a • Mortality	Intertidal LAUs (1,2 and 4) 12 impact and 4	• Quarterly for one (1) year prior to construction • Biannual routine health monitoring (at the end of the dry and the wet seasons) from construction commencing. • Routine aerial survey data will be collected quarterly for the first two years, reducing to biannually (end of wet and dry

BCH type	Methods / Monitoring program components	Parameters / Indicators	Location of monitoring sites	Frequency + other monitoring conditions
	• Collect data for qualitative, quantitative and general observations **Mangrove Spatial Survey** • Georeferenced aerial imagery will be captured within a 200 m x 200 m survey area, at each site, to monitor. the spatial extent of seaward and landward mangroves **Data Analysis** • Calculate average canopy cover, mortality and number of saplings and seedlings across each site. • Assess impact sites against trigger and threshold criteria.	• Number of seedlings and saplings • Invertebrate burrows and invertebrate observations. • Leaf health, flowering, insect damage.	reference sites	season) if no impacts are detected, for a further two years, then annually. • Reactive monitoring in response to a qualifying event
Samphire	**Samphire Health Monitoring** • Establish 10 monitoring sites (including 2 reference sites) along 10 intertidal gradient transects (considering groundwater, surface water and tidal inundation patterns). • Survey three 8 x 8 m quadrats at each location, with five random 1 x 1 m plots within the quadrat for fine-scale detail. **Samphire Spatial Survey** • Georeferenced aerial imagery will be captured within a 200 m x 200 m survey area, at each site, to monitor. the spatial extent of samphire. **Data Analysis** • Calculate the average percentage cover and plant health across each site. • Assess impact sites against trigger and threshold criteria,	• Percentage cover • Overall Plant Health • Heights and size distribution • Mortality • Tip die-off • Colour, flowering and growth forms.	Intertidal LAUs (1 to 4) 8 impact and 2 reference sites	• Quarterly for one (1) year prior to construction • Biannual routine health monitoring (at the end of the dry and the wet seasons) from construction commencing. • Routine aerial survey data will be collected quarterly for the first two years, reducing to biannually (end of wet and dry season) if no impacts are detected, for a further two years, then annually. • Reactive monitoring in response to a qualifying event

BCH type	Methods / Monitoring program components	Parameters / Indicators	Location of monitoring sites	Frequency + other monitoring conditions
Subtidal BCH: seagrass	**Seagrass Health Monitoring** • Establish six monitoring sites (including one reference site). • Three replicate 50 m transects will be surveyed, using a 0.25 x 0.25 m quadrat collected every metre. • Concomitantly monitor sediment porewater (salinity) at each location using three permanently deployed sippers **Data Analysis** • Calculate the average percentage cover across each site • Calculate the average Porewater salinity at each site Assess impact sites against trigger and threshold criteria	• Percent cover • Assemblage composition/ diversity • Sediment porewater salinity	LAU 2, 3 and 6 5 impact and 1 reference sites	• Quarterly for one (1) year prior to construction • Biannual routine health monitoring (at the end of the dry and the wet seasons) from construction commencing. • Reactive monitoring in response to a qualifying event
Tidal flood height/ surface water monitoring	Water level stations to measure continuous water level data.	Stations will be established to measure water level at designated surface water runoff diversion locations & areas of predicted reduction in tidal inundation near monitoring sites. Provides a line of evidence for changing conditions. Validation	14 surface water monitoring sites and 7 tidal regime monitoring sites.	Data collected will be used to annually undertake posthoc modelling of tidal inundation and surface water flows

BCH type	Methods / Monitoring program components	Parameters / Indicators	Location of monitoring sites	Frequency + other monitoring conditions
		against predicted models.		
Groundwater level and quality (under GMMP)	Refer to GMMP for detailed methods	Shallow and deep bores	Coastal bore network	Continuous water level data Quarterly water quality (electrical conductivity) data

Table 8: Coordinates of intertidal monitoring transect start and finish points (GDA 2020z50)

Transect number	Start		Finish		Purpose
	Easting	Northing	Easting	Northing	
T1	421548.2	7692490.8	420267.2	7690358.4	Corresponds with the western groundwater reference site, and includes seaward and landward mangroves, algal mat and samphire reference monitoring sites on the west side of the Proposal to be compared to the impact sites.
T2	422561.6	7689271.5	422858.6	7692594.5	Corresponds with a groundwater monitoring site, and includes seaward and landward mangroves, algal mat and samphire monitoring sites.
T3	424926.9	7689460.5	426018.6	7691384.5	Corresponds with a groundwater monitoring site, and includes seaward and landward mangroves, algal mat and samphire monitoring sites.
T4	426894.9	7688473.5	427065.7	7690998.5	Corresponds with a groundwater monitoring site, and includes seaward and landward mangroves, algal mat and samphire monitoring sites.
T5	428672.2	7690436.5	428565.6	7691842.5	Corresponds with a groundwater monitoring site, and includes seaward and landward mangroves, algal mat and samphire monitoring sites.
T7	435876.3	7694783.3	435049.4	7695122.5	Corresponds with a groundwater monitoring site, and includes algal mat and samphire monitoring sites.
T6	435473.4	7693416.5	435478.5	7692997.5	Corresponds with a groundwater monitoring site, and includes algal mat and samphire monitoring sites.
T8	437720.2	7695498.5	437578.0	7696889.5	Corresponds with a groundwater monitoring site, and includes seaward and landward mangroves, algal mat and samphire monitoring sites.
T9	439548.1	7696787.5	439751.1	7695244.5	Corresponds with a groundwater monitoring site, and includes seaward and landward mangroves, algal mat and samphire monitoring sites.
T10	441404.3	7696842.1	442611.7	7695569.1	Corresponds with the eastern groundwater reference site, and includes seaward and landward mangroves, algal mat and samphire reference monitoring sites on the east side of the Proposal to be compared to the impact sites.

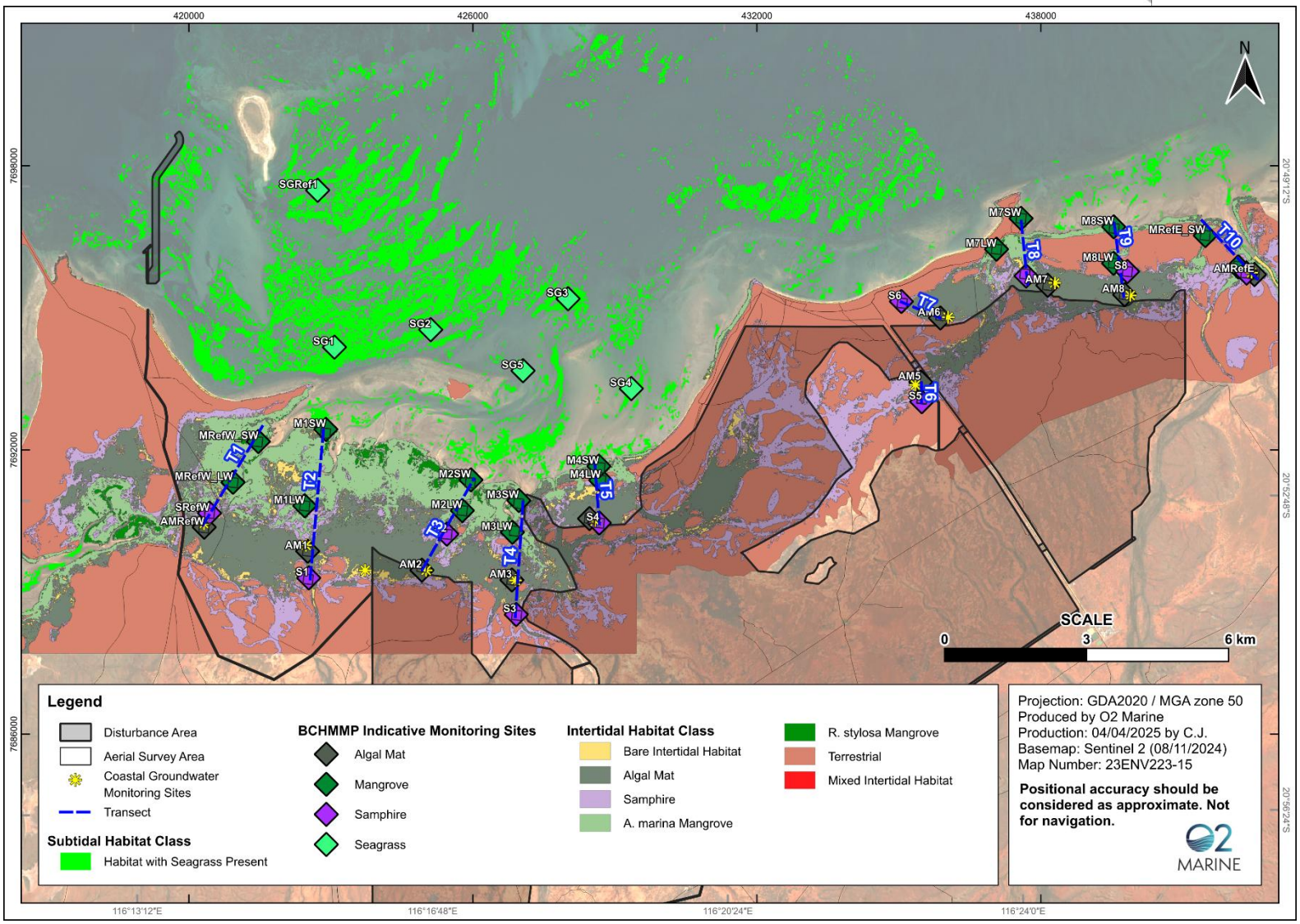

Figure 5: Indicative monitoring locations

2.1. Monitoring Frequency

The BCHMMP encompasses routine activities and responsive measures, including establishment surveys, routine health monitoring, and reactive monitoring and management actions in response to a trigger event, which may include but is not limited to:

- A bund failure or seepage
- A toxicant spill
- Monitoring data indicating a significant change: coastal inundation and/or sea level rise.
- Reports of fauna deaths or impacts
- Exceedance of environmental quality guidelines (managed under the MEQMMP)
- Exceedance of trigger levels from other related management plans (i.e., GMMP)
- After cyclones or heatwaves, if warranted

The implementation of those monitoring activities will allow LS to respond effectively to unforeseen potential impacts to BCH and therefore have improved success in achieving the management targets of the BCHMMP. Table 9 provides a comprehensive overview of the different monitoring activities and frequencies outlined in Sections 2.4 to 2.9.

Table 9: Overview of monitoring activities frequency

Nature of the monitoring	Timing/frequency	Objectives	Considerations
Baseline surveys	Quarterly for one (1) year prior to the construction phase.	• To confirm the suitability of the monitoring locations, including the suitability of reference sites as representative of similar communities. • Develop a seasonal baseline dataset to facilitate understanding of natural variability and detect project related changes	Consideration for groundwater and surface water monitoring locations will be considered if any alterations needed to be made to the site locations
Routine health monitoring	Biannually (at the end of the dry and the wet seasons) from construction commencing, provided monitoring results do not suggest an unexpected level of impact. Frequency to be integrated with aerial survey,	• To assess changes to the condition and abundance of BCH at the local scale at nominated monitoring sites.	Aerial surveys will be implemented concurrently with health monitoring to facilitate integration between data collection.
Routine Aerial Survey	Quarterly during baseline surveys to develop	• To provide additional lines of evidence to	

Nature of the monitoring	Timing/frequency	Objectives	Considerations
	correlations with routine on ground monitoring. Reduce to biannually (end of wet and dry season) from construction commencing if no impacts are detected.	understand broad-scale changes over the Project site	
Tidal flood depth/surface water	Data collected will be used to annually undertake posthoc modelling of tidal inundation and surface water flows	• To provide information relevant to the relationship between hydrological changes and BCH health and distribution.	
Reactive monitoring	If a BCH health trigger level is exceeded, the frequency of monitoring at the sites where the trigger is exceeded may increase. If this occurs, monitoring at those sites may increase to monthly until the trigger level is no longer exceeded.	• To investigate the cause of impact using multiple lines of evidence approach to determine if the change observed is natural or potentially attributable to Project activities.	Reactive monitoring will include the measurement of all parameters as routine monitoring. It may also include additional monitoring methodologies if required.

2.2. Reactive Monitoring

If a BCHMMP threshold is exceeded and is deemed to be project-attributable, reactive monitoring will be undertaken to investigate any secondary impacts to the habitat. Other qualifying events for reactive monitoring may include a groundwater or tidal flood/surface water threshold level exceedance, a wall breach, spill or cyclone, or may be initiated from trigger or threshold exceedances under other environmental management plans. The reactive monitoring will be undertaken as soon as practicable after the identified event, allowing for the appropriate tidal and weather conditions to effectively compare to the previous data.

Reactive monitoring may be subject to the nature of the qualifying event. For example, if a groundwater trigger level is exceeded, the location will be noted and a BCH reactive survey may be required at the closest site, across multiple sites (including reference sites), or additional reactive sites may need to be established.

If the habitat health threshold level is exceeded, the frequency of monitoring at the sites where the threshold is exceeded may increase. If this occurs, monitoring at those sites may increase to monthly until the threshold level is no longer exceeded. The monitoring program may also be required to collect additional data onsite for determination of cause and whether attributable to the Project activities. For example, groundwater samples for measurements of conductivity/salinity or additional tidal flood

depth /surface water stations may be required to be collected and assessed in close proximity to BCH monitoring locations.

Reactive monitoring will include the measurement of all parameters as the routine monitoring. It may also include aerial photography over the monitoring locations to understand the extent of the habitat and monitor if any losses are identified. Further management actions are given in Section 1.7.4.

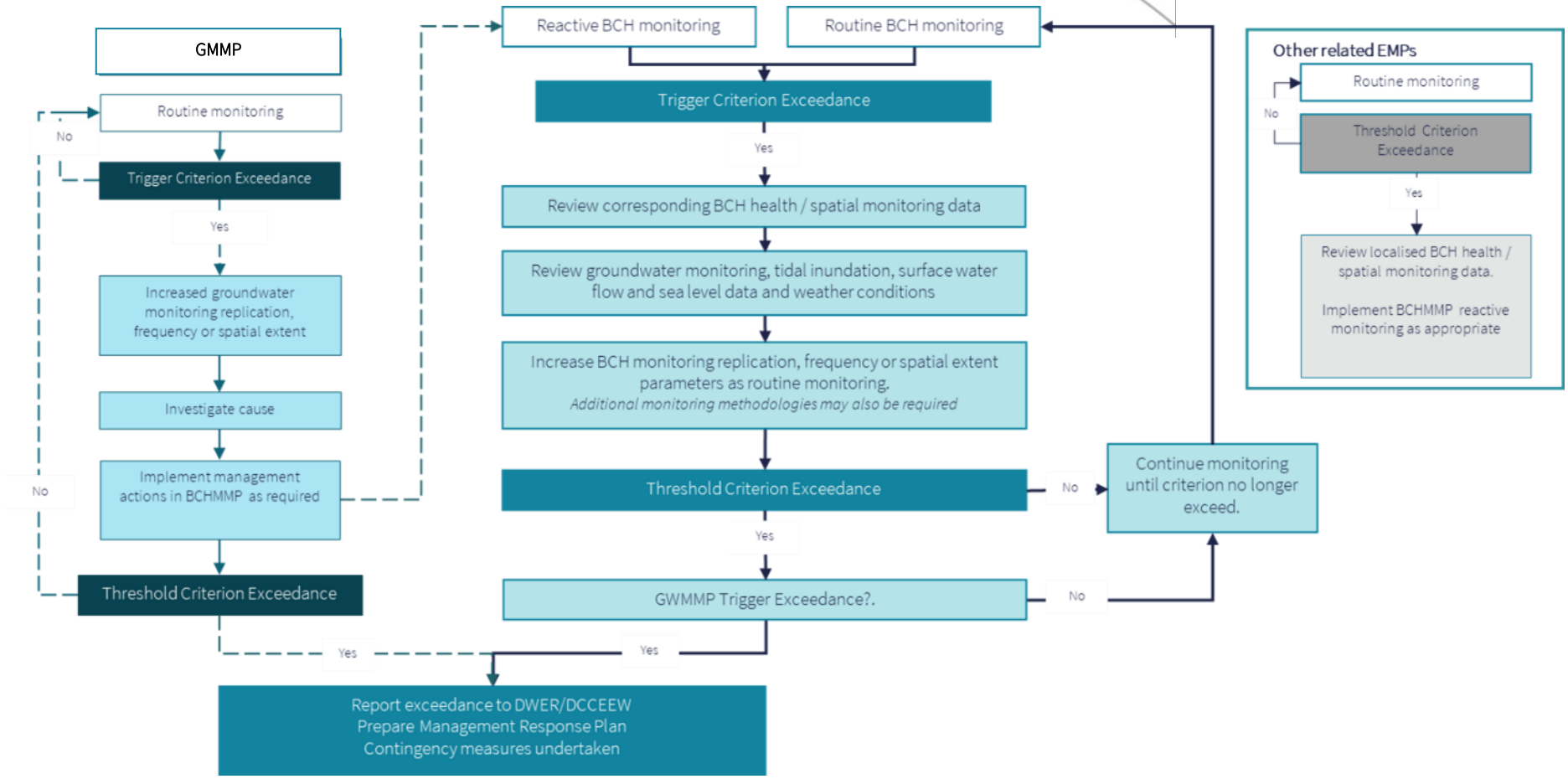

Figure 6: Flowchart for reactive BCH monitoring

2.3. Data analysis

Following the completion of baseline data collection, a power analyses will be undertaken to ensure the monitoring program has sufficient power to detect changes in health.

During routine operations, statistical data analysis will be conducted to determine change over time and compared to the reference sites using Generalised Linear Model (GLM) multi-factorial Analysis of Variance (ANOVA) performed using a suitable selected distribution to determine pairwise contrasts of the change in cover between sites and surveys through time.

Statistical analysis may also be undertaken for quantitative health assessment parameters, using multivariate control charts and ANOVA if significant differences ($p<0.05$) are detected and further analysis is required.

Interpretation of monitoring results will be undertaken using the application of the Before / After / Control / Impact (BACI) experimental design. In the BACI design, each successive monitoring survey is compared to the initial and preceding surveys. If significant changes are detected, the data from the impact site is further compared to the reference site data to ascertain whether it reflects natural variation or is potentially attributable to the Proposal.

2.4. Algal mats health monitoring

The algal mat monitoring program will consist of monitoring the health, diversity and extent of the mat-forming algae at nominated monitoring locations. Monitoring methods have been included to complement existing baseline algal mat studies undertaken at the proposal site, with guidance (specifically around productivity monitoring via chlorophyll-a assessment) taken from Actis Consulting (2024). The monitoring design is subject to review and updates pending current research results, and guidance from regulatory authorities.

2.4.1. Methods

Three permanent belt transects will be established at each monitoring site, each transect will comprise 16 quadrats of 1 x 1 m, with a 1 m corridor in between so that algal mats within the plots are not disturbed during the surveys. The quadrats will be established in a zig-zag pattern at 1 m intervals along the transect (Figure 7).

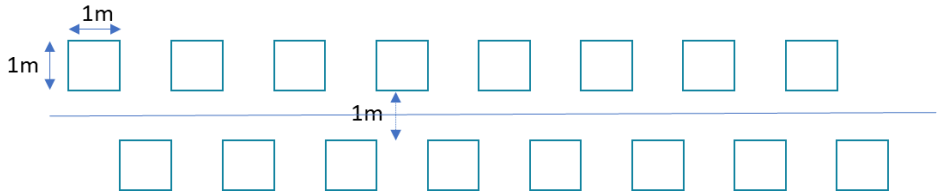

Figure 7 Transect design for algal mat health monitoring.

The health of the algal mats will be determined using percent cover (active and dormant cover) and total Field Nett Productivity (using chlorophyll-a). Other parameters including: species diversity, colour, and texture will be used as supplementary metrics to inform the health assessment.

Visual estimation of percent ground cover and observations of condition will be estimated within each quadrat. This will include the percent cover of both active and dormant mats.

A chlorophyll-a sample will be collected within each transect via a 5 cm deep core (preferably of 32 mm diameter), with sampling methods, storage, processing, analysis and calculation of the total Field Nett Productivity (t C yr^{-1}) undertaken in accordance with Actis (2024). Chlorophyll-a samples will be collected each survey event to allow statistical comparison across sites and seasons. A total of three replicate samples will be taken per monitoring location.

Additionally, a sample for species identification will be obtained by excising the intact sediment surface.

2.4.2. Locations

A total of 8 impact and 2 reference monitoring sites have been proposed within the Proposal area (Figure 8). The indicative locations of these sites have been determined based on the estimated productivity status of the algal mat (Very Active, Active and Low) (Actis 2024), proximity to the pond wall, as well as groundwater and tidal flood depth/surface water monitoring locations (Figure 12). Note: site locations are indicative and will be reassessed for suitability during the initial field campaign.

Three replicate belt transects will be established at each monitoring site at a similar distance parallel to the pond walls to reduce variation associated with distance from the pond or ocean. The indicative coordinates of the monitoring locations are given in Table 10. Replicate belt transects within each

monitoring site will be labelled with the suffix “a”, “b” or “c” as appropriate. Coordinates of each of the replicate belt transects will be recorded in the first report. The coordinates of the centre point for the 200 m x 200 m algal mats survey areas are provided in Table 25. Algal mats health monitoring sites and survey areas are outlined in Figure 8.

Table 10: Indicative coordinates of algal mat monitoring locations (GDA 2020z50)

Algal mat monitoring sites	Easting	Northing	Purpose
AMRefE	442513.6	7695703.8	Reference location on the eastern end of the Proposal area
AMRefW	420323.4	7690366.6	Reference location on the western end of the Proposal area
AM1	422510.0	7689859.0	Impact monitoring site
AM2	424922.8	7689457.9	Impact monitoring site
AM3	426824.5	7689251.1	Impact monitoring site
AM4	428464.4	7690547.7	Impact monitoring site
AM5	435463.0	7693432.1	Impact monitoring site
AM6	435877.3	7694784.8	Impact monitoring site
AM7	438146.7	7695475.5	Impact monitoring site
AM8	439771.0	7695278.0	Impact monitoring site

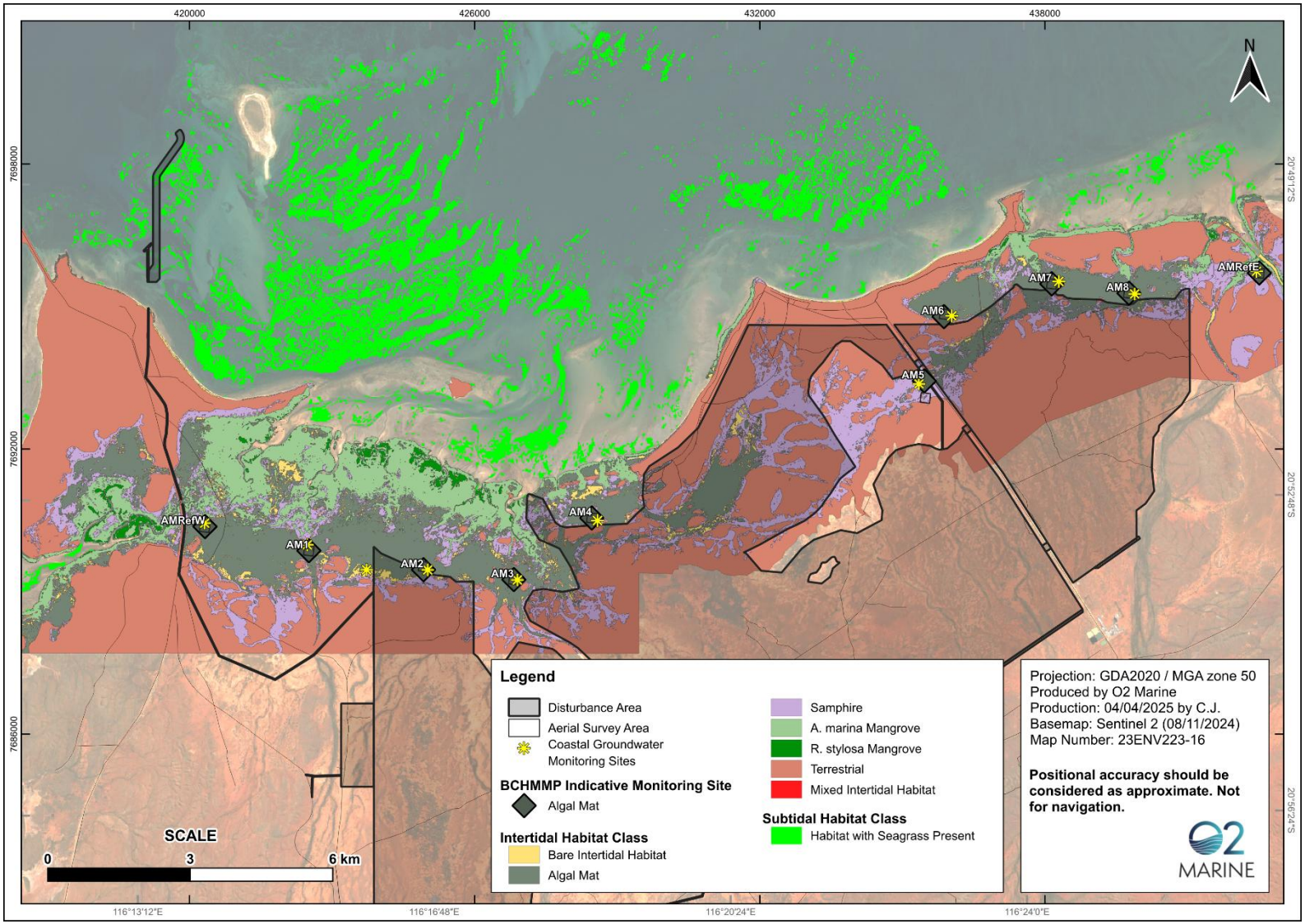

Figure 8: Indicative monitoring sites for algal mats

2.4.3. Trigger and threshold levels

The trigger and threshold levels for on ground monitoring are presented in Table 11 and Table 12.

In the event of a trigger exceedance of percent cover or total Field Nett Productivity, other health data collected during surveys, as well as information collected from other EMPs (e.g.., GMMP), will be evaluated in multiple lines of evidence assessment to determine if the change observed is natural or potentially attributable to the Proposal

Table 11: Trigger levels for algal mat health

Parameter	Trigger level
Percentage cover	Retain a minimum of 80% baseline algal mat percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data **OR**
Chlorophyll-a	Retain a minimum of 85% baseline total Field Nett Productivity (t C yr^{-1}) calculated over three samples within the same site over time and, is not significantly different ($p<0.05$) from the changes in reference site data.

Table 12: Threshold levels for algal mat health

Parameter	Threshold value
Percentage cover	Retain a minimum of 50% baseline algal mat percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data **AND**
Chlorophyll-a	Retain a minimum of 70% baseline total Field Nett Productivity (t C yr^{-1}) calculated over three samples within the same site over time and, is not significantly different ($p<0.05$) from the changes in reference site data.

2.4.3.1. Trigger and threshold assessment

Percentage cover and total Field Nett Productivity for each site (3 x 16m belt transects) is tested against a pooled (average) baseline data as well as reference site data observed during the same survey period. Inter-site variability in measurements across permanent belt transects will be assessed. The appropriate parametric or equivalent non-parametric statistical test will be selected based on data distribution, sample size, and test assumptions, and applied to the trigger and threshold assessment. Justification for the chosen statistical test will be provided in each monitoring report.

2.5. Mangrove health monitoring

The mangrove monitoring program will consist of monitoring the health, diversity, and extent of the assemblages at nominated monitoring locations.

2.5.1. Methods

An on-ground mangrove health assessment will be undertaken biannually at the end of the dry and the wet seasons initially to monitor the health of mangrove communities adjacent to the Proposal area, dependent on the correlation with aerial survey. Mangrove health monitoring will be conducted at 16 monitoring sites (8 landward and 8 seaward mangrove sites).

For scattered mangrove communities, three 8 x 8 m replicate quadrats will be established parallel to the pond bund walls, creek line and/or coastline (where practical). Within each quadrat, five randomly placed plots measuring 1 x 1 m will be measured for fine-scale indicators within each quadrat, resulting in 15 plots over the 3 replicate quadrats at each monitoring site. Plots will be positioned to encompass at least one tree.

For closed-cover mangrove communities, quadrat sizes will be reduced to 4 x 4 m due to the increased density of trees.

2.5.1.1. Canopy cover

Using a densiometer, 20 readings will be taken in each quadrat at chest height to measure canopy cover. Each reading is comprised of a set of four records taken in each plot, one facing north, south, east and west. Where mangrove height is restricted (i.e. <2 m), densiometer readings will be collected from a lower height. Where mangrove height restricts readings using the densiometer, each surveyor will estimate the percent coverage visually and an average of the two readings recorded for each plot.

2.5.1.2. Mangrove individual counts

The number of trees within each quadrat will be counted, namely dead and alive adult individuals, and the number of seedlings and saplings counted separately from the adult counts. Invertebrate burrow numbers will also be recorded, and up to ten random adult trees will be selected to measure the height (where practicable).

2.5.1.3. Diameter breast height

The number of main stems from up to 10 random trees will be counted. Up to ten measurements of stem thickness will be collected at breast height (or lower if necessary) and may be used to calculate above ground biomass using existing relationships for species present in the Pilbara, if available.

2.5.1.4. Tagged tree chlorophyll-a

Up to five adult trees will be tagged within each quadrat and a GPS location of each taken. Trees will be representative of the community within the quadrat. Twenty measurements of chlorophyll-a concentrations will be taken from each tree *in situ* using a handheld chlorophyll meter, reducing to ten measurements in subsequent monitoring surveys.

2.5.1.5. Qualitative health assessment

General observational photographs and qualitative observations will be taken at each plot. Leaf health monitoring will be undertaken using the Duke et al. (2005) classification system, where 10 observations

in the plot will be classified as Healthy (green leaves <10 % dead/yellowing leaves), sick (yellow, wilting leaves, approx. 10-50% dead/yellowing leaves) or dead (>50% dead/yellowing leaves). Further qualitative observations recorded will include flowering, insect damage and invertebrates present.

2.5.2. Locations

A total of 12 impact and 4 reference monitoring sites will be established along the Proposal area, based on the proximity to the pond wall, groundwater monitoring locations and tidal flood depth/surface water stations (Table 26). The density and productivity of mangrove assemblages also varies along the gradient from the pond wall to the sea, and therefore mangrove locations along the transect will include landward scattered and closed canopy seaward assemblages. Reference sites for mangroves have been selected at both Western and Eastern sides of the Proposal development envelope.

At each monitoring site, there will be three replicate permanent quadrats. The replicate quadrats will be established parallel to the pond walls and coastline to reduce variation associated with distance from the pond or ocean. The coordinates of the monitoring locations are given in Table 13. Replicate quadrats within each monitoring location will be labelled with the suffix “a”, “b” or “c” as appropriate. The coordinates of the centre point for the 200 m x 200 m mangrove survey areas are provided in Table 13. All mangrove monitoring sites and survey areas are outlined in Figure 9.

Table 13: Coordinates of mangrove monitoring locations (GDA 2020z50)

Mangrove monitoring sites	Easting	Northing	Purpose
Landward monitoring sites			
MRefW_LW	420931.6	7691314.7	Reference location on the western end outside the Proposal area
M1LW	422448.0	7690816.8	Impact monitoring site
M2LW	425777.3	7690717.7	Impact monitoring site
M3LW	426834.7	7690259.2	Impact monitoring site
M4LW	428701.8	7691357.9	Impact monitoring site
M7LW	437064.0	7696238.0	Impact monitoring site
M8LW	439537.0	7695940.0	Impact monitoring site
MRefE_LW	442171.2	7695865.0	Reference location on the eastern end outside the Proposal area
Seaward monitoring sites			
MRefW_SW	421466.7	7692175.0	Reference location on the western end outside the Proposal area
M1SW	422894.1	7692431.9	Impact monitoring site
M2SW	425959.0	7691365.7	Impact monitoring site
M3SW	426971.6	7690929.7	Impact monitoring site

Mangrove monitoring sites	Easting	Northing	Purpose
M4SW	428662.5	7691654.5	Impact monitoring site
M7SW	437583.0	7696889.0	Impact monitoring site
M8SW	439541.1	7696710.0	Impact monitoring site
MRefE_SW	441475.6	7696524.9	Reference location on the eastern end outside the Proposal area

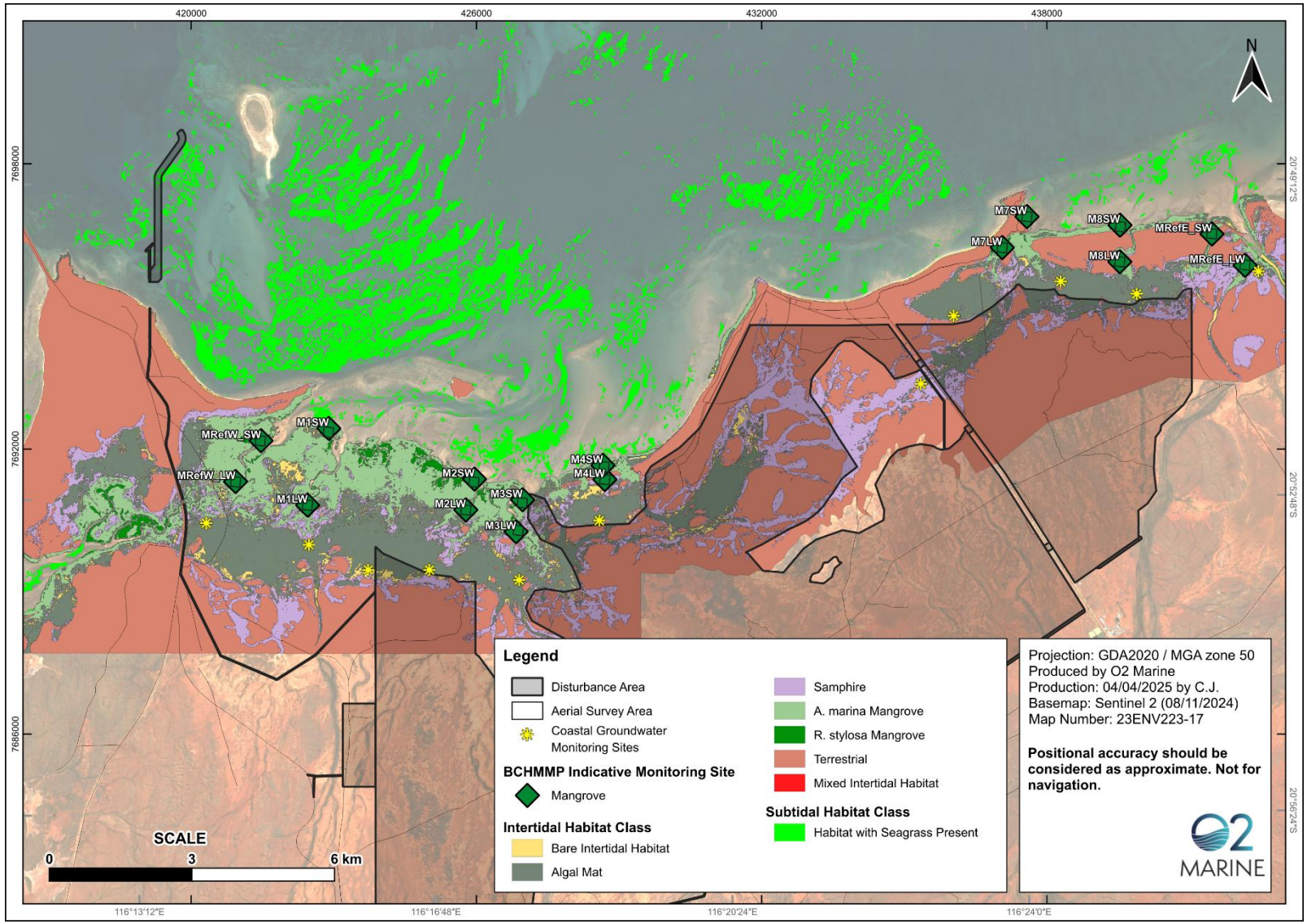

Figure 9: Indicative monitoring sites for mangroves

2.5.3. Trigger and threshold levels

The trigger and threshold levels are presented in Table 14 and Table 15. Mangroves within regionally significant mangrove area #9 (RSMA #9) require a more conservative approach, and the triggers and thresholds for these monitoring locations are given in Table 16 and Table 17.

In the event of a trigger or threshold exceedance, complementary health indicators (e.g. mortality, number of saplings and seedlings), other data collected during surveys and information collected from other EMPs (e.g.., GMMP) will be evaluated in multiple lines of evidence assessment to determine if the change observed is natural or potentially attributable to the Proposal. A threshold exceedance may trigger the implementation of contingency measures and remediation actions detailed in a Management Action Plan, as described in Section 3.2.

Table 14: Trigger level for mangrove health

Parameter	Trigger level
Percentage canopy cover	A minimum of 80% baseline canopy cover is retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) from the reference site data **OR**
Number of dead adult mangroves	No significant increase in the average number of dead adult mangroves from baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **OR**
Number of saplings and seedlings	No significant decrease in the average number of seedlings/saplings counted from baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data

Table 15: Threshold levels for mangrove health

Parameter	Threshold level
Percentage canopy cover	A minimum of 50% baseline canopy cover retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **AND**
Number of dead adult mangroves	No significant increase in the average number of dead adult mangroves from baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **AND**
Number of saplings and seedlings	No significant decrease in the average number of seedlings/saplings counted from baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data.

Table 16: Trigger level for mangrove health at RSMA #9 – Cape Preston monitoring locations

Parameter	Trigger level
Percentage canopy cover	A minimum of 90% baseline canopy cover retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data

Parameter	Trigger level
Number of dead adult mangroves	No significant increase in the average number of dead adult mangroves from the baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **OR**
Number of saplings and seedlings	No significant decrease in the average number of seedlings/saplings counted from the baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data

Table 17: Threshold levels for mangrove health at RSMA #9 – Cape Preston monitoring locations

Parameter	Threshold level
Percentage canopy cover	A minimum of 80% baseline canopy cover is retained as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) from the reference site data
Number of dead adult mangroves	No significant increase in the average number of dead adult mangroves from baseline as calculated over three quadrats within the same site and any loss is not significantly different ($p<0.05$) to the reference site data **AND**
Number of saplings and seedlings	No significant decrease in the average number of seedlings/saplings counted from baseline as calculated over three quadrats within the same site and any decrease is not significantly different ($p<0.05$) to the reference site data.

2.5.3.1. Trigger and threshold assessment

The retained canopy cover ratio will be calculated for each site and quadrat by dividing the current survey's values by the baseline values. These quadrat-level values will then be averaged for each site to assess whether trigger and threshold values are met.

To test whether the loss in canopy cover at impact sites is significantly different from the loss at reference sites, a one-sided Mann-Whitney U test will be performed on the percent canopy cover retained values for each impact site (three replicate quadrats per site) versus the matching values of pooled reference sites (six replicate quadrats for RSMA and six replicate quadrats for non-RSMA reference sites). The Mann-Whitney U test has been selected because it handles small sample sizes well and is not as sensitive to data distribution as GLMs.

To test whether there is a significant increase in the average number of dead adult mangroves or a decrease in the average number of seedlings/saplings from the baseline, one-sided Mann-Whitney U tests will be performed on the raw counts at each impact site, comparing the three current values from the three quadrats to the pooled pre-operation values from the same quadrats. The Mann-Whitney U test has been chosen after careful consideration due to uncharacteristic data distributions and small sample sizes, which these exact tests handle well. For sites where these tests yield a significant increase in dead trees or a significant decrease in seedlings and saplings, further analysis will be conducted to determine whether the magnitude of change is greater than that of reference sites by running Mann-Whitney U tests on the difference between current and baseline values for the three current datapoints per impact site versus the difference between current and baseline values at all reference sites together.

2.6. Samphire Health Monitoring

The samphire monitoring program will consist of monitoring the health and extent at nominated monitoring locations.

2.6.1. Methods

At each monitoring location, quantitative and qualitative indicators will be measured within three 8 x 8 m replicate quadrats that will be established parallel to the pond bund walls, creek line and coastline (where possible).

2.6.1.1. Quantitative data

Heights and size distribution will be determined from up to 10 random measurements. Total percent cover will be visually estimated using five randomly placed 1 x 1 m plots within the quadrat. The number of individuals and dead plants will also be counted within the 1 x 1 m plots

Tip die off will also be noted, by counting the number of dead tips on up to 10 plants within each quadrat. Tagging plants may have a detrimental effect on the plant health over a long period of time, and therefore tagged branches for measurement will not be used for this program.

2.6.1.2. Qualitative data

The plant health of each *Tecticornia* shrub will be classified based on a modified classification system (Table 18) from Casson et al. (2009). Photos of the plots within the quadrats will also be taken and may aid in species identification as required. The qualitative data will include observations of colour, flowering and growth forms.

Overall plant health will be calculated by averaging health rating scores per plot to obtain the mean plant health rating for each site.

Table 18: Modified plant health scale based on Casson et al. (2009)

Health rating	Description
0	Healthy, no dead articles
1	Occasional dead articles
2	Tips of branches stressed or dying
3	Entire or whole branches dying or dead
4	More than half shrub dead
5	Shrub dead

2.6.2. Locations

Permanent monitoring sites – eight impact and two reference - will be established within the study area. The locations of these sites will be determined based on the proximity to the pond bund wall, groundwater monitoring locations and tidal flood depth/surface water stations (Figure 12).

At each monitoring site, three replicate quadrats measuring 8 x 8 m will be established. The three replicate quadrats will be located parallel to the pond bund walls, creek line and coastline (where

possible) to reduce variation associated with distance from the pond or ocean. The coordinates of the monitoring sites are given in Table 19. Replicate quadrats within each monitoring site will be labelled with the suffix “a”, “b” or “c” as appropriate. The coordinates of the centre point for the 200 m x 200 m for samphire mats survey areas are provided in Table 19. All samphire monitoring sites and survey areas are outlined in Figure 10.

Table 19: Indicative coordinates of samphire monitoring locations (GDA 2020z50)

Samphire monitoring sites	Easting	Northing	Purpose
SRefE	442348.2	7695733.7	Reference location on the eastern end outside the Proposal area
SRefW	420435.3	7690662.2	Reference location on the western end outside the Proposal area
S1	422532.0	7689295.0	Impact monitoring site
S2	425449.3	7690219.1	Impact monitoring site
S3	426916.6	7688521.5	Impact monitoring site
S4	428670.8	7690455.3	Impact monitoring site
S5	435485.6	7693015.9	Impact monitoring site
S6	435054.0	7695133.2	Impact monitoring site
S7	437690.1	7695672.7	Impact monitoring site
S8	439830.5	7695766.7	Impact monitoring site

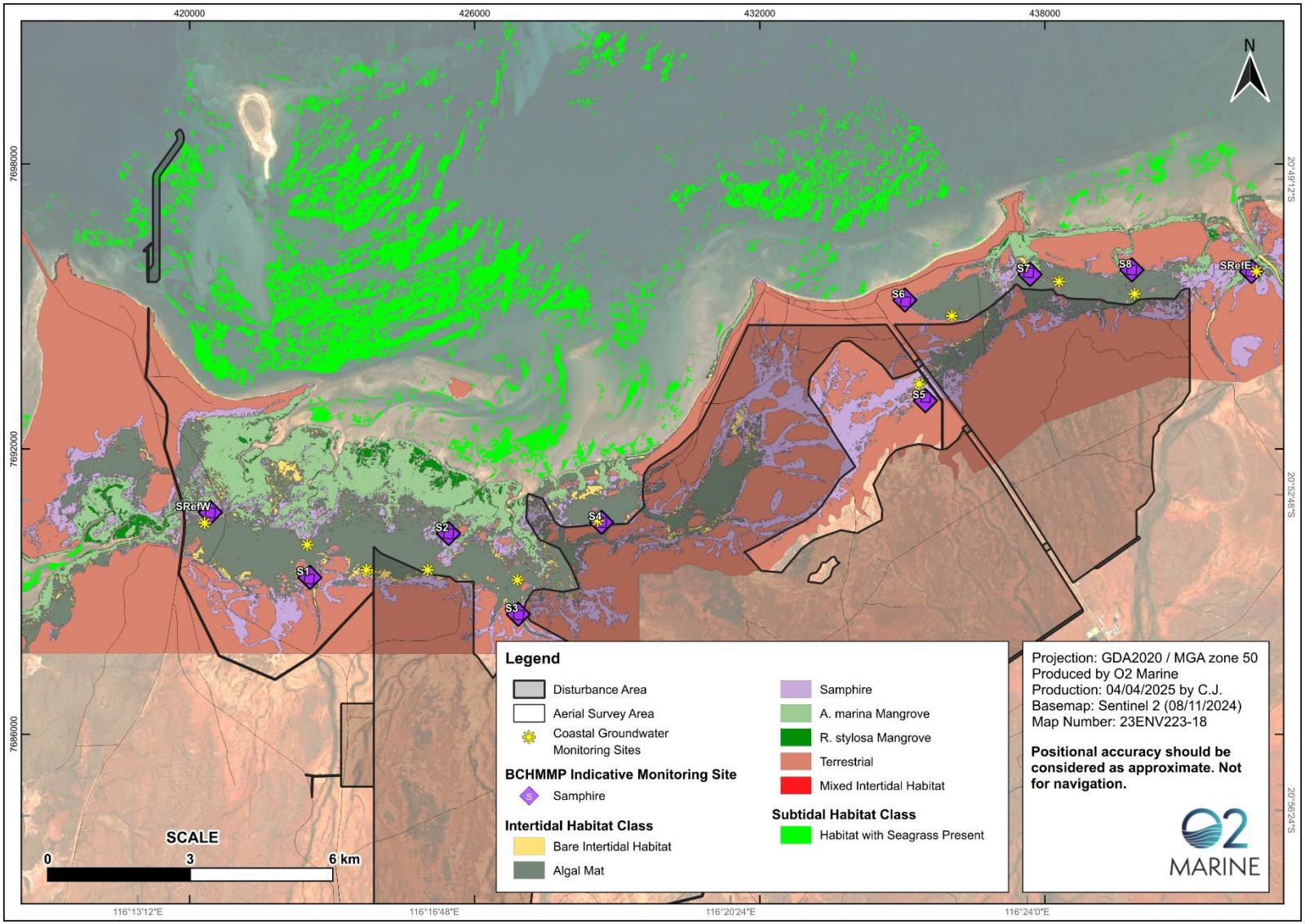

Figure 10: Indicative monitoring sites for samphire.

2.6.3. Trigger and threshold levels

The trigger and threshold levels are presented in Table 20 and thresholds in Table 21. In the event of a trigger or threshold exceedance, complementary health indicators (e.g., overall plant health), other data collected during surveys and information collected from other EMPs (e.g.., GMMP) will be evaluated in multiple lines of evidence assessment to determine if the change observed is natural or potentially attributable to the Proposal. A threshold exceedance may trigger the implementation of contingency measures and remediation actions detailed in a Management Action Plan, as described in Section 3.2. Associated management actions are described in Section 1.7.4.

Table 20: Trigger levels for samphire health

Parameter	Trigger level
Percentage cover	Retain a minimum of 80% baseline samphire percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) to the changes in reference site data **OR**
Overall plant health	No significant increase in the average plant health scores (i.e. decline in overall health) over three plots at the same site and is not significantly different ($p<0.05$) from the changes in reference site data

Table 21 Threshold levels for samphire health

Parameter	Trigger level
Percentage cover	Retain a minimum of 50% baseline samphire percent cover calculated over three quadrats of the same site over time and is not significantly different ($p<0.05$) to the changes in reference site data **AND**
Overall plant health	No significant increase in the average plant health scores (i.e. decline in overall health) over three plots at the same site and is not significantly different ($p<0.05$) from the changes in reference site data

2.6.3.1. Trigger and threshold assessment

Percentage cover for each site is tested against a pooled (average) percentage cover at the reference sites observed during the same survey period, as well as against baseline data.

The health rating for each site is calculated by averaging the rating scores and rounding up to the nearest whole number. This is used to assess if the health rating, per Casson *et al.* (2009) decreases. The health rating for each site will be tested against changes in the reference site health rating scores.

Inter-site variability in measurements across each 8 m^2 quadrat will be assessed. The appropriate parametric or equivalent non-parametric statistical test will be selected based on data distribution, sample size, and test assumptions, and applied to the trigger and threshold assessment. Justification for the chosen statistical test will be provided in each monitoring report.

2.7. Subtidal BCH health monitoring

While risks to marine subtidal communities as a result of the Proposal are predicted to be minimal, to account for any uncertainty in the impact assessment and to ensure that important nearshore subtidal BCH remains protected, monitoring of key subtidal BCH (including seagrass and macroalgae) is to occur in nearshore locations adjacent to the development envelope susceptible to potential changes to surface water, groundwater quality groundwater regimes, and marine environmental quality.

Inshore coastal bays, lagoons, and estuarine environments that are typically influenced by freshwater run-off and low salinity surface waters are known to be an important habitat for some commercial fish species during the larval stage (e.g. grey mackerel). Specifically, macroalgae beds in less than 10 m and seagrass beds are the preferred habitat of the regionally commercially significant bluespotted emperor juveniles (DPIRD Draft Report, *unpublished).* Juvenile prawns, including indicator species western king prawn and brown tiger prawn, are also associated with seagrass beds, inhabiting nursery areas for three to six months before migrating offshore (Kangas et al. 2015).

The dominant sub-tidal BCH in the nearshore zone is macroalgae. However, macroalgae differ from other marine plants such as seagrasses and mangroves in that macroalgae lack roots, leafy shoots, flowers, and vascular tissues. It is for this reason that seagrass is considered a more suitable BCH type to monitor. However, macroalgae occurring within subtidal communities will still be recorded.

A tiered monitoring program has been designed to detect any sublethal changes in seagrass that may occur because of the implementation and ongoing operation of the Proposal. This program assumes a cause-effect continuum between changes to groundwater flow/quality or surface water/nutrient flow and reductions in seagrass health. Criteria have been developed based on baseline monitoring programs to ensure appropriate and timely management actions are implemented, including multiple lines of evidence approach to verify impacts and ensure the key outcomes of the BCHMMP are achieved. Given seagrass extent annual variability, a baseline seagrass survey will be conducted at least 12 months prior to any disturbance within the marine environment. Baseline monitoring will be undertaken to verify monitoring locations and methods are fit for purpose and to ensure any changes in the environment beyond natural variation (i.e. as a result of the Proposal) can be detected. Part of the baseline survey intent is to identify suitable sites co-located as close to groundwater, surface water and tidal inundation monitoring locations as possible which support sufficient seagrass cover for statistical evaluation of change.

The key stressors of concern include:

- Enhanced salinity in sediment porewater (originally emanating from below salt production ponds)
- Alteration to surface water and nutrient flows (due to salt production ponds).

2.7.1. Methods

2.7.1.1. Seagrass Health

Diver-based transects will be used to collect data from each site, which will be analysed to determine seagrass percent cover (total and for each genus, to cater for shifts in species dominance). Total percent cover of other benthic flora (e.g., macroalgae) within sites will also be recorded. The sampling methodology is based upon Vanderklift et al (2016), whereby at each site, three 50 m transects are surveyed, with a 0.25 x 0.25 m image collected every metre (n=150 per site). Additional qualitative observations will also be recorded such as evidence of dead rhizome mat, presence of invasive marine species, or other benthic fauna and flora (including macroalgae).

2.7.1.2. Sediment Porewater

Sediment porewater (salinity) will be monitored at seagrass monitoring sites using porewater sippers (or equivalent). At each site, three sippers will be permanently deployed to enable *in-situ* sampling of porewater from ~15 cm sediment depth, noting the root system for most ephemeral seagrasses is typically shallow (<5 cm depth). Timing of sampling will coincide with seagrass health monitoring.

2.7.2. Locations

A total of five impact and one reference monitoring sites will be established within the subtidal zone, close to the Project area. During the establishment survey, effort will be made to localise additional reference sites. The current locations have been based on habitat mapping results which highlighted the areas of higher density seagrass and other BCH including macroalgae within subtidal areas where changes in health due to groundwater may be detected as early as possible. Coordinates of the BCH monitoring locations are given in Table 22 and locations are presented in Figure 11.

Table 22: Coordinates of subtidal BCH monitoring locations (GDA 2020z50)

Subtidal BCH monitoring sites	Easting	Northing	Purpose
SG1	423075.5	7694168.6	Impact monitoring site
SG2	425108.9	7694537.9	Impact monitoring site
SG3	428011.4	7695191.2	Impact monitoring site
SG4	429347.1	7693293.4	Impact monitoring site
SG5	427059.2	7693671.6	Impact monitoring site
SGRef1	422720.6	7697482.1	Seagrass reference site

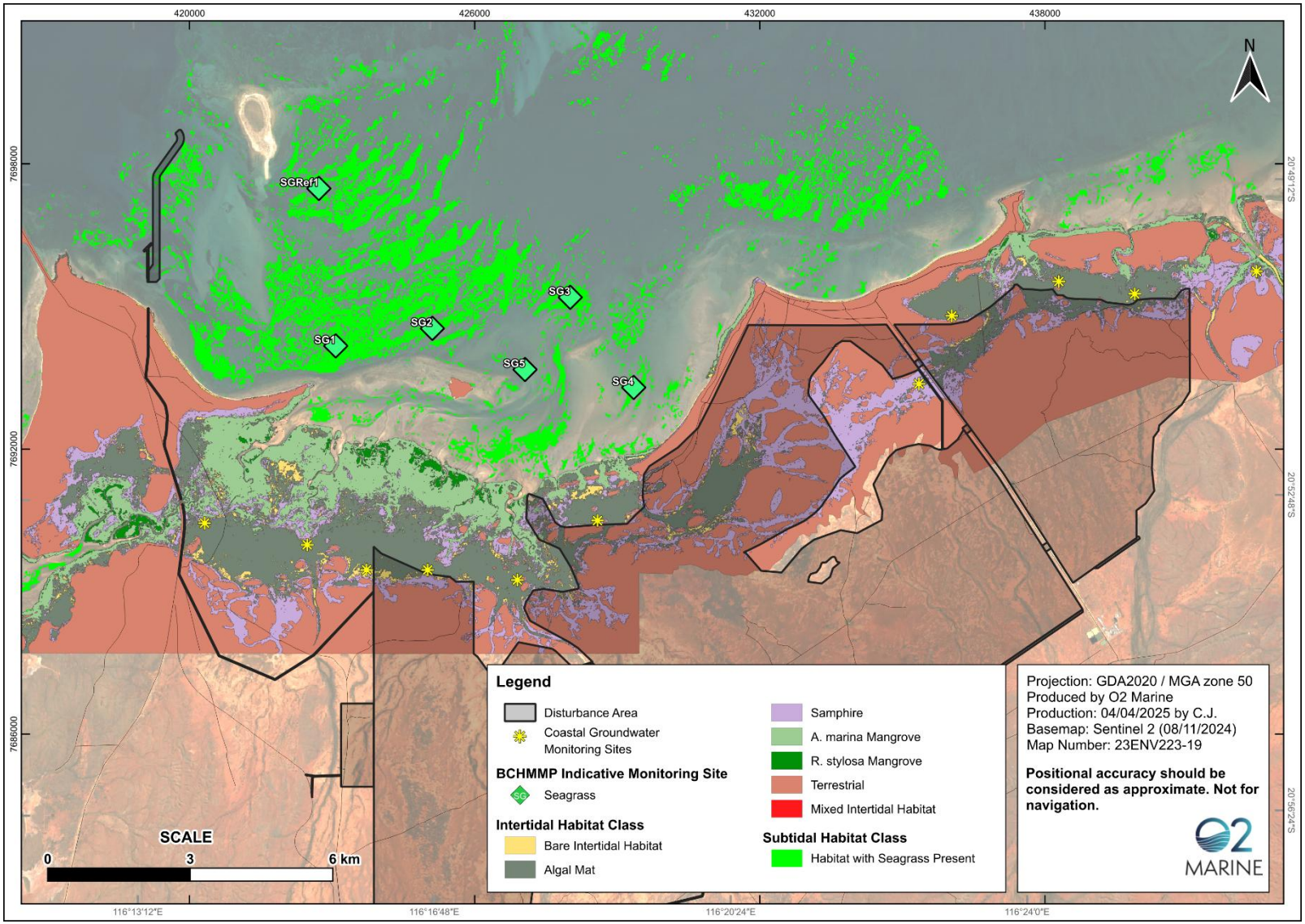

Figure 11: Indicative monitoring sites for seagrass

2.7.3. Trigger and threshold levels

Trigger levels for subtidal BCH health will be based on porewater salinity criteria defined based on a comparison of the median against the 80th percentile of baseline data. The trigger and thresholds for subtidal BCH will be based on percentage cover as given in Table 23 and Table 24.

In the event of a trigger or threshold exceedance of percent cover, other health data collected during surveys, as well as information collected from other monitoring surveys, will be evaluated in multiple lines of evidence assessment to determine if the change observed is natural or potentially attributable to the Proposal. Associated management actions are described in Section 1.7.4.

Table 23: Trigger levels for subtidal BCH health

Parameter	Trigger level
Percentage cover	Retain a minimum of 80% baseline subtidal BCH percent cover calculated over three transects of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data
Porewater Salinity	Porewater salinity median at impact sites within the 80th percentile of reference site data

Table 24: Threshold levels for subtidal BCH health

Parameter	Threshold level
Percentage cover	Retain a minimum of 60% baseline subtidal BCH percent cover calculated over three transects of the same site over time and is not significantly different ($p<0.05$) from the changes in reference site data

2.8. Aerial Survey

Georeferenced aerial imagery is ideal for efficiently measuring *distribution* (spatial extent/change) of intertidal and supratidal BCH over time and is regularly used across north-western Australia to map and monitor mangrove habitats, such as at the Port of Ashburton (PPA 2020), and the remote Kimberley and Pilbara region (Hickey & Radford 2022). Remotely sensed multispectral data is also increasingly being used to monitor mangrove *health* within the northern region of Australia. This includes the long-term mangrove monitoring program for Darwin Harbour (DEPWS 2022), a similar environment with dense mangrove habitats. However, remote capture monitoring techniques have not been adopted as frequently for samphire and algal mats, largely due to limited validation (against in situ health measures) in these habitats (Hickey & Lovelock 2022). Most recently, the intertidal habitats of the eastern Exmouth Gulf were mapped using remote sensing data to create a habitat model, specifically targeting cyanobacterial mats (Hickey et al. 2023). Despite the novel application of such techniques for many forms of BCH, however, it is clear that (i) remote sensing remains the best option to better understand patterns in change at scales that are ecologically meaningful, and (ii) with more frequent application, the methods that are used will only evolve and improve in time.

2.8.1. Methods

Georeferenced aerial imagery will be captured over each BCH health monitoring sites. Table 8 details the centre coordinate for each aerial survey area. Within a 200 m x 200 m survey area (from the centre point of each survey location), both visible RGB (Red, Blue Green) and multispectral aerial imagery will be captured simultaneously to assess BCH extent and health. Using a georeferenced image means that the survey methods are repeatable and allow accurate change detection (spatial extent and health) over time. Data extracted from aerial imagery will be ground-truthed by foot during in-field BCH assessments to verify accuracy.

A high-resolution, georeferenced orthomosaic image of each survey area will be produced for analysis. Using a combination of visual analysis, in field verification and GIS tools, BCH extent (i.e. in hectares) will be calculated for each individual survey area. Similarly for health assessment, multispectral imagery will be used to calculate vegetive indexes[6], which, when used in conjunction with other field measurements, provides a robust assessment of vegetation health. A mean index value will be calculated for each survey area and compared over time.

[6] Normalised Difference Vegetative Index (NDVI), or other suitable vegetive index such as EVI or SIPI2.

Table 25: Indicative coordinates of the centre of 200 m x 200 m survey area for aerial surveys (GDA 2020z50)

Survey area	Transect	Easting	Northing	Purpose
Algal Mat Aerial Sites				
AMRefW	1	417533.0	7691109.0	Reference location on the western end outside the Proposal area
AM1	2	422509.0	7689857.5	Impact monitoring site
AM2	3	424922.0	7689522.3	Impact monitoring site
AM3	4	426823.4	7689249.6	Impact monitoring site
AM4	5	428463.4	7690546.2	Impact monitoring site
AM5	6	435485.4	7693071.4	Impact monitoring site
AM6	7	435888.2	7694833.6	Impact monitoring site
AM7	8	438145.7	7695474.0	Impact monitoring site
AM8	9	439767.3	7695277.5	Impact monitoring site
AMRefE	10	417533.0	7691109.0	Reference location on the eastern end outside the Proposal area
Mangrove Aerial Sites				
MREFW_SW	1	417649.7	7690182.3	Reference location on the western end outside the Proposal area (Seaward)
M1SW	2	422884.6	7692351.0	Impact monitoring site
M2SW	3	425945.3	7691303.3	Impact monitoring site
M3SW	4	426964.0	7690865.0	Impact monitoring site
M4SW	5	428683.6	7691623.3	Impact monitoring site
M7SW	8	437582.0	7696887.5	Impact monitoring site
M8SW	9	439548.4	7696675.0	Impact monitoring site
MREFE_SW	10	442113.2	7697143.2	Reference location on the eastern end outside the Proposal area (Seaward)
MREFW_LW	1	442384.6	7696047.8	Reference location on the western end outside the Proposal area (Landward)
M1LW	2	422446.9	7690815.3	Impact monitoring site
M2LW	3	425776.2	7690716.2	Impact monitoring site
M3LW	4	426879.1	7690284.1	Impact monitoring site
M4LW	5	428700.8	7691356.4	Impact monitoring site
M7LW	8	437063.0	7696236.5	Impact monitoring site

Survey area	Transect	Easting	Northing	Purpose
M8LW	9	439536.0	7695938.5	Impact monitoring site
MREFE_LW	10	442384.6	7696047.8	Reference location on the eastern end outside the Proposal area (Landward)
Samphire Aerial Sites				
SRefW	1	417546.2	7691924.1	Reference location on the western end outside the Proposal area
S1	2	422519.1	7689265.2	Impact monitoring site
S2	3	425452.5	7690216.4	Impact monitoring site
S3	4	426924.8	7688506.3	Impact monitoring site
S4	5	428669.7	7690453.8	Impact monitoring site
S5	6	435492.2	7693083.8	Impact monitoring site
S6	7	435069.8	7695096.6	Impact monitoring site
S7	8	437662.0	7695711.9	Impact monitoring site
S8	9	439829.5	7695765.2	Impact monitoring site
SRefE	10	442419.0	7694266.6	Reference location on the eastern end outside the Proposal area

2.8.2. Trigger and threshold levels

The aerial survey is implemented concurrently to the on ground health monitoring, and each will be used to inform the analysis of results from the BCHMMP or trigger reactive monitoring or management actions.

Given the infancy of the science using remote sensing techniques for some forms of BCH, trigger and threshold will be developed on completion of the baseline study and in consultation with the regulator.

2.9. Tidal flood depth/surface water monitoring

The Proposal will result in changes to hydrological regimes, both tidal and overland (Preston Consulting 2023).

The Groundwater Monitoring and Management Plan (GMMP) has been designed to cover EV4 - Algal Mats and Samphire, and EV5 – Aquatic vegetation (mangroves). Tidal flood depth/surface water monitoring data collected via the GMMP will provide information relevant to the relationship between hydrological changes and BCH health and distribution. The monitoring information will be used to ascertain whether impacts to BCH are occurring because of:

- Alteration of tidal regime associated with the Proposal (i.e., pond bund walls or due to seawater abstraction)
- Changes to freshwater flow volume discharged to the marine environment associated with the Proposal (i.e. due to drainage diversions and rainfall capture within the ponds)
- Sea level rise related to climate change.

Data collected will be then incorporated into desktop exceedance investigations into BCH trigger and threshold criterion as part of a Proposal attributability assessment.

2.9.1. Methods

As part of the mitigation measure listed in the Proposal ERD (Preston Consulting 2023), LS is proposing to:

- Collect water quality data for surface water bodies before and during operations to monitor for natural variation and for impacts that may potentially arise from the Proposal.
- To verify inundation modelling results after construction to ensure potential indirect impacts to the tidal regimes of the intertidal zone are within predicted outcomes and allow potential final drainage modifications if required. The verification monitoring will collect data from several points within the intertidal zone, including:
    a) Water levels.
    b) Inundation periods; and
    c) Flow rates.

Based on the above, Tidal flood depth/surface water will be monitored to ensure that changes in hydrological regimes, including surface water, can be detected and responded to effectively before an ecological impact occurs.

Tidal flood depth/surface water will be monitored continuously. A combination of radar water level (RWL) meters and tide gauges are proposed. The RWL is a downward facing radar that will calibrate from the substrate and record reductions in the readings when surface or tidal water is present. The difference in the reduced height will be equivalent to the depth of water above the substrate (or depth height surveyed back to LAT). Tide gauges measure the depth of water above the sensor and will be located where deeper channels occur.

2.9.2. Locations

The GMMP surface water monitoring sites have been selected at locations across the project area where surface water will be diverted. Seven (7) of the monitoring sites are within the intertidal zone and will include tidal flood depth monitoring. Coordinates of the current and proposed Tidal flood depth/surface water stations are given in Table 26 and locations are presented in Figure 12.

Table 26: Coordinates of tidal flood depth/surface water monitoring locations

Tidal/ surface water monitoring sites	Easting	Northing	Purpose
Tid 1	422510	7689859	Within algal mat habitat
Tid 2	424923	7689458	Within algal mat habitat, close to pond wall
Tid 3	426824	7689251	Within algal mat habitat
Tid 4	426835	7690259	Next to the mangrove monitoring sites, close to the seawater intake.
Tid 5	428494	7690484	Within algal mat habitat, close to pond wall
Tid 6	435877	7694785	Within algal mat habitat, close to pond wall
Tid 7	439771	7695278	Within algal mat habitat, close to pond wall

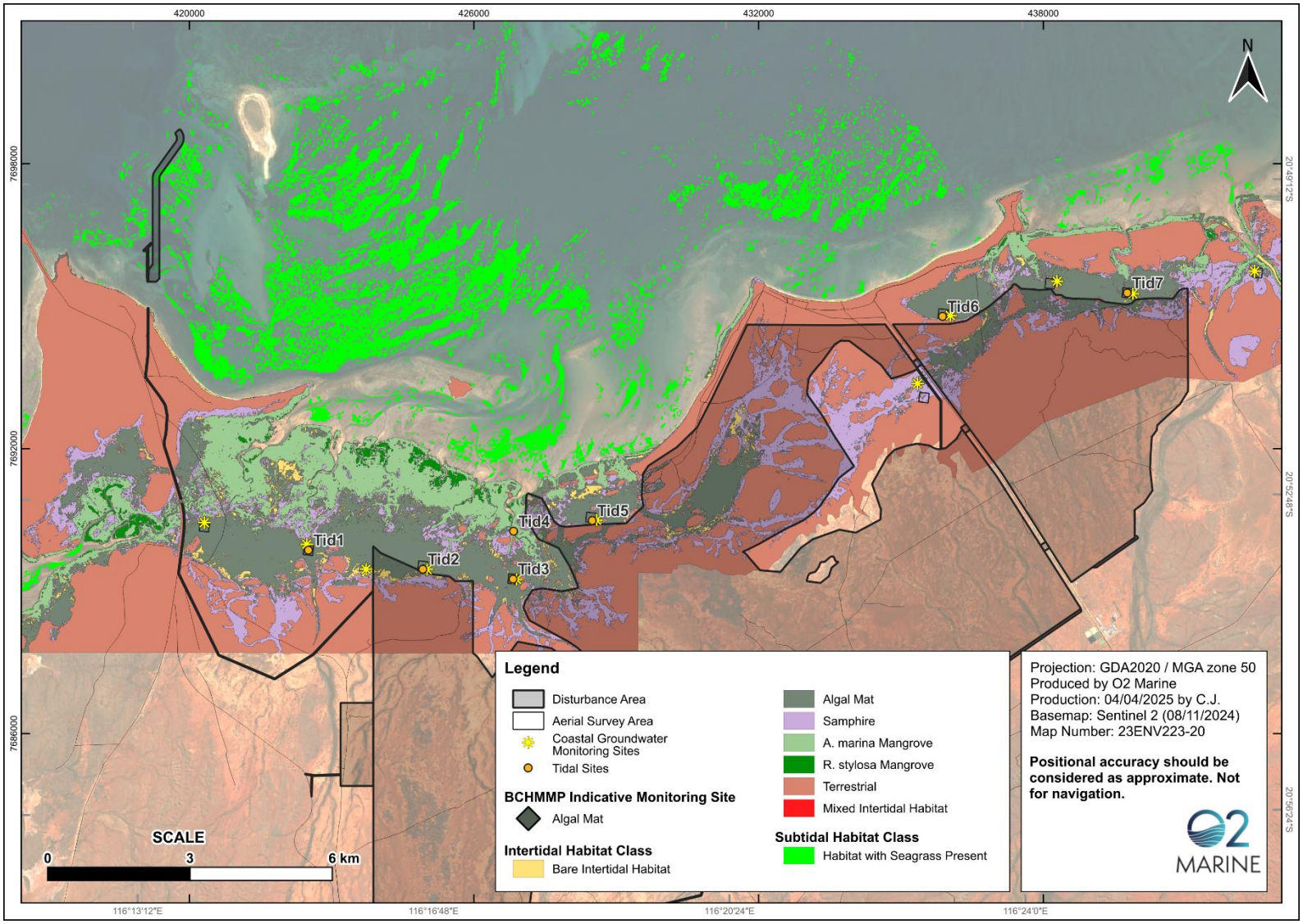

Figure 12: Indicative Tide and surface water monitoring sites

2.9.3. Trigger and threshold levels

No trigger levels or threshold criteria will be required for inundation monitoring programs, as data will only be included into desktop exceedance investigations of trigger criteria exceedances to ascertain if there was any influence from these factors on the exceedance (i.e., multiple lines of evidence). However, if significant changes are observed in post-hoc modelling from that which was predicted, triggers may need to be derived based on potential or predicted impacts to BCH. Appropriate levels of change to utilise for such a trigger are not able to be evaluated quantitatively at present.

Where tidal or surface water hydrological regimes may have impacted a trigger criteria exceedance but are not related to the Proposal (i.e., rainfall and sea level rise), then no further action may be required (i.e., reactive monitoring).

Alternatively, tidal or surface water hydrological regimes may result in impacts to BCH, reactive post-hoc modelling and/or engineering modification to provide optimal tidal or surface water flows across the intertidal zone may be required (i.e., diversion or drainage modifications, pumping water etc.) to protect BCH from activities associated with the Proposal.

Sea level rise is monitored globally by organisations including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the Intergovernmental Panel on Climate Change (IPCC). Nationally, the Bureau of Meteorology (BOM) and Geoscience Australia facilitate the Australian Baseline Sea Level Monitoring Project, tracking long term changes in sea levels around the coastline of Australia. Whilst monitoring long term changes in sea level rise is beyond the scope of the BCHMMP, desktop investigations will include a review of international and national reporting as an additional line of evidence.

3. Reporting

Baseline data will be reported within an annual report provided at the end of the baseline survey period. From the commencement of routine monitoring, monitoring data will be assessed against the trigger and threshold criteria and reported in both a Survey Report and an annual report. If the trigger or threshold criteria (or both) were exceeded during the reporting period, the annual report will include a description of the effectiveness of trigger criteria level actions, and threshold criteria contingency actions that have been implemented to manage the impact, as well as an analysis of trends.

3.1. Regulatory reporting

Annual monitoring reports, as outlined earlier, will be generated every year and made readily available upon request. These monitoring reports will include an assessment against the environmental outcome and management objectives listed in Section 1.7.4. Reporting requirements will be reviewed on receipt of final regulatory conditions.

If monitoring or investigations at any time indicate an exceedance of threshold criteria specified in the BCHMMP, LS will report any exceedance to the CEO and DCCEEW (in writing) within 21 days of the exceedance being identified along with the proposed management approach to address the exceedance, detailing the following:

- Implemented threshold contingency actions
- Their effectiveness against management targets and threshold criteria
- Investigation findings
- Measures to prevent the threshold criteria being exceeded in the future
- Justification (where relevant) of the threshold criteria remaining or being adjusted based on better understanding.

3.2. Management Action Plan

Where further investigative studies have resolved a direct or indirect link between LS activities and an exceedance of threshold criteria (specified in this BCHMMP) LS will commence the development of a Management Action Plan, which is to be reviewed alongside the BCHMMP by a suitably qualified intertidal and subtidal benthic ecologist within six months of the exceedance being reported. The Management Action Plan will describe contingency measures and remediation actions to be undertaken in response to a threshold exceedance.

If the independent review recommends that the BCHMMP be revised, LS will submit a revised BCHMMP to DCCEEW for the approval of the Minister within eight months of any such exceedance.

4. Adaptive management and review

4.1. Adaptive management

LS is committed to improving environmental results and management practices throughout the implementation of the Proposal and therefore will use an adaptive management approach for this BCHMMP. Adaptive management practices will include:

- Routine (i.e. post survey) review and comparison of monitoring data and information gathered against established baseline, ongoing monitoring and reference data.
- Annual evaluation of monitoring and management outcomes against management targets and the objectives of this BCHMMP.
- Review of management actions throughout the implementation of the Proposal, and identification of potential new management measures, methodologies, and technologies that may be more effective.
- Review of monitoring data, information, trigger and threshold criteria and management actions described in the in-force BCHMMP in response to an exceedance.
- Review of the outcomes and revisions of the GMMP.
- Review of the effectiveness of the BCHMMP in detecting impacts to BCH
- An assessment of the effectiveness of any reactive monitoring, interventions or management actions implemented to protect BCH as a result of exceedances under the other environmental management plans with the outcomes of the assessment to be provided to DWER within two weeks of completion of the investigation
- Following selection and confirmation of offset research programs, review of objectives, targets and completion criteria detailed in the Proposal's Offsets Strategy document every five years.

4.2. Review requirements

The BCHMMP will be reviewed annually through the construction phase, or as required in response to monitoring data, and every two years during operations. The Plan will be updated based on review outcomes. The review will consider whether best practice and management targets are being achieved or are likely to be achieved and will identify any updates required to realise the targets. An independent expert peer review of the BCHMMP will be undertaken within three years of commencement, or once preliminary results from the ESSP Research Offset Program have been released, whichever occurs sooner, to review whether the plan remains fit for purpose for achieving, monitoring and substantiating outcomes established in Section 1.7.4.

Reactive monitoring in the BCHMMP may be triggered by groundwater exceedances recorded under the GMMP. The BCHMMP review will incorporate outcomes from the implementation of the GMMP, with revision of triggers and thresholds as appropriate. Similarly, as the GMMP is reviewed, the BCHMMP will be updated if required. Following this, the BCHMMP will continue to be reviewed every two years as described above.

5. Stakeholder consultation

The content of this BCHMMP has been developed after consulting the following stakeholders/experts:

- Actis Consulting (Mr Mark Coleman)
- Edith Cowan University (Dr Shannon Dee)
- EPA Services at DWER
- Land and Water Consulting
- O2 Marine
- Phoenix Environmental Services
- Preston Consulting

Ongoing consultation with EPA Services, DCCEEW, DPIRD, WAMSI, WAFIC and other interested fishing groups will be undertaken throughout the implementation of this BCHMMP.

The in-force BCHMMP, along with other MMPs, will be made publicly available on LS's website.

6. References

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LWC (2023a) Eramurra Solar Salt Project: Hydrologic Assessment. Report prepared by Land and Water Consulting for Leichhardt Salt Pty Ltd.

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MScience (2022) Eramurra Solar Salt Project Introduced Marine Pest Risk Assessment.

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O2M (2025b) Eramurra Solar Salt Project: Subtidal Benthic Communities and Habitat. Report prepared by O2 Marine for Leichhardt Salt Pty Ltd.

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Appendix A – Existing Environment

Historical survey effort

Several surveys and studies have been undertaken to assess BCH within the Proposal study areas (Table 27):

Table 27: List of most recent BCH surveys and studies

Survey and Studies	Monitoring Period	Reports
Intertidal and Subtidal BCH Survey	Detailed intertidal BCH surveys were undertaken by O2 Marine in 2020 and 2021 Subtidal BCH surveys were undertaken by O2 Marine between July 2018 and March 2023	• O2 Marine (2025a) Eramurra Solar Salt Project – Intertidal Benthic Communities and Habitat. Report prepared for Leichhardt Salt Pty Ltd; • O2 Marine (2025b) Eramurra Solar Salt Project – Subtidal Benthic Communities and Habitat. Report prepared for Leichhardt Salt Pty Ltd; • O2 Marine (2025c) Eramurra Solar Salt Project – Benthic Communities and Habitat Cumulative Loss Assessment. Report prepared for Leichhardt Salt Pty Ltd;
Regional intertidal mapping	Regional intertidal mapping was undertaken in 2022 by EnSTaR using satellite-based remote sensing	• EnSTaR (2025a) Eramurra mapping: Mangrove – Remote Sensing; • EnSTaR (2025b) Eramurra mapping: Algal mat – Remote Sensing;
Algal mat Productivity	A survey was undertaken by Actis Environmental Services in 2021 and 2022 and Actis Consulting in 2023 to investigate the productivity of algal mats in the development envelopes, Indicative Disturbance Footprint and LAUs.	• Actis Consulting Pty Ltd (2023) Benthic Mat Study – Productivity estimates of local assessment units. ESSP-EN-14-TRPT-0029. • MScience (2023) Peer Review – Benthic Mat Study.
Introduced Marine Pest Risk Assessment		• MScience (2022) Eramurra Solar Salt Project Introduced Marine Pest Risk Assessment.

The information provided by those reports relevant to this BCHMMP is summarised in the sections below.

Local Assessment Units (LAUs)

Thirteen LAUs were established across the Study Area to provide a regional context for characterisation, mapping and assessment of impacts on BCH. The location and extent of the LAUs are shown in Figure 13. Consistent with the guidance provided by EPA (2016b), the 13 LAUs were established in consideration of the following key factors:

- BCH type, condition, extent and distribution;
- Management boundaries (i.e. RSMA);
- Bathymetry; and
- Coastal geomorphology.

Additional information related to the LAUs is provided in the Proposal ERD (Preston Consulting 2023) and the BCH Cumulative Loss Assessment Report (O2 Marine 2025c).

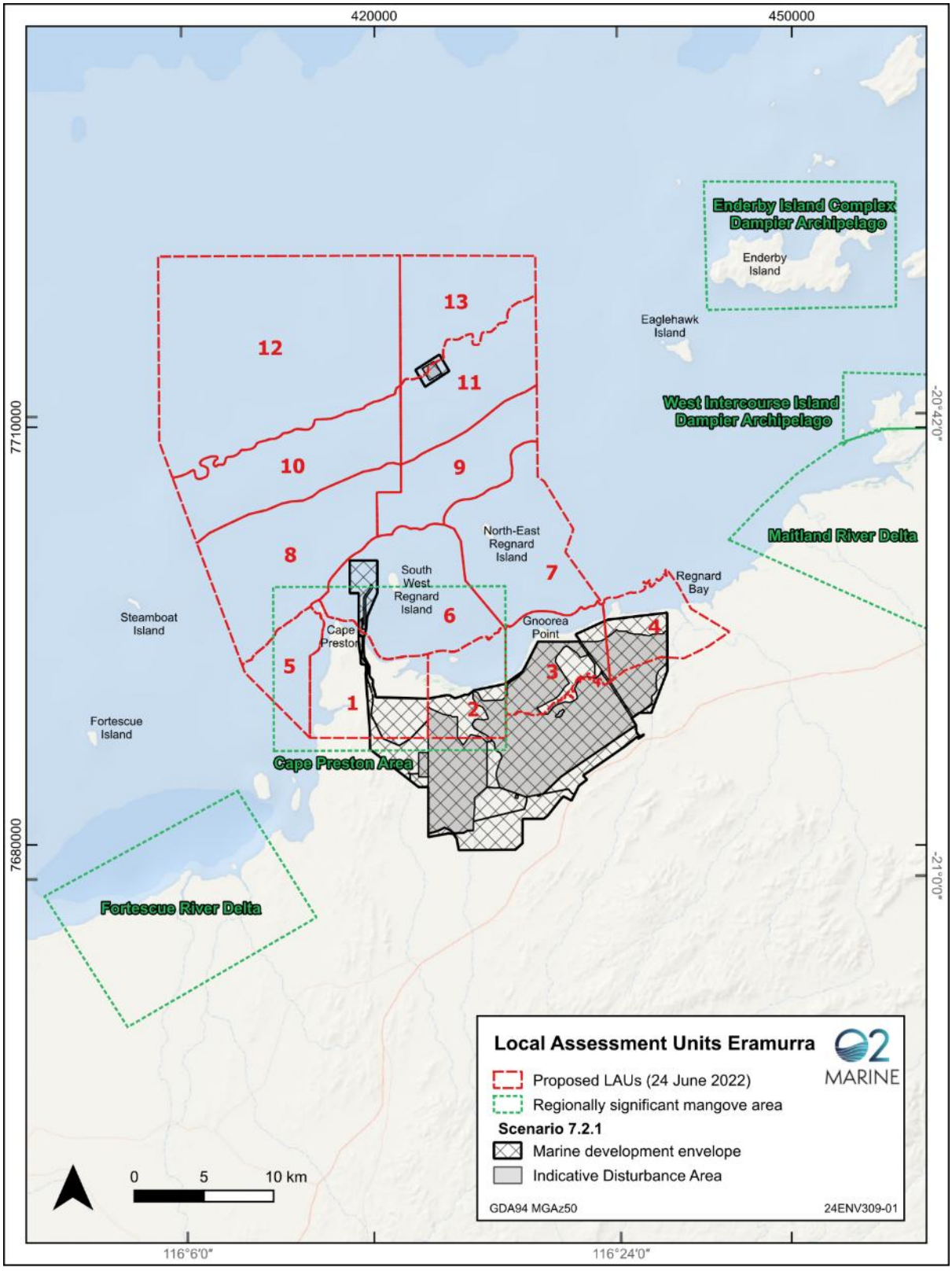


Figure 13: Proposal LAUs and RSMAs

Benthic Communities and Habitat Summary

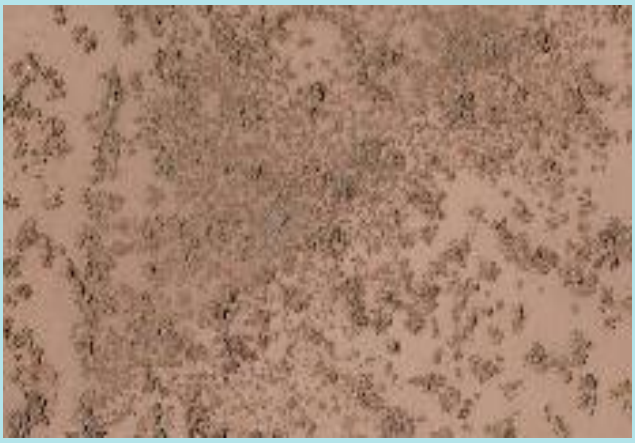
A total of eighteen (18) BCH classes were identified and mapped, including ten intertidal and eight subtidal BCH classes. For the purposes of this study (due it its significant representation within LAUs 1-4), the 'Terrestrial' BCH class, whilst not a true intertidal habitat, has been included under the intertidal category. A brief description of each BCH class is provided in Table 28 and the extent and distribution of these BCH classes are shown in Figure 14.

Table 28: Description of the BCH of the Proposal coastline

BCH Class	Description (Area)	Example Image
Intertidal BCH		
Terrestrial	Grassland and dune vegetation e.g. spinifex, hummock/tussock grassland. Includes roads and infrastructure.	 
***Avicennia marina* Mangrove**	Am1 Closed canopy mangrove comprised of large, spreading trees, often with limbs that bend down onto the substrate. This community is usually only 10 -30 meters wide and backed by *Rhizophora stylosa* (Rs) either in a monospecific stand or mixed association (Am) or *A. marina* (landward edge).	

BCH Class	Description (Area)	Example Image
	Am2 The largest area of mangrove association comprised of trees that show a decline in height moving from seaward to landward and often backed by the scattered mangrove.	
	Am3 The point where *A. marina* landward edge displays canopy gaps, and these gaps eventually become larger in total area than the surrounding *A. marina* mangrove. Individual scattered mangroves were excluded if tree density was less than approximately five trees per 100 m^2	
***R. stylosa* Mangrove**	Rs Typically closed canopy and dense, occurring either at the seaward edge in bands 20 – 30 meters wide and behind *A. marina* seaward mangroves as sprawling forests. Also found as fingers extending into the landward *A. marina* mangroves along narrow shallow tidal channels.	

BCH Class	Description (Area)	Example Image
	RS/Am A mixed association of *R. stylosa* and *A. marina*, usually found in a transition zone between the *R. stylosa* monospecific stands and the monospecific stands of the landward edge *A. marina* closed canopy, however, also occurs at the seaward edge where trees are typically older and larger. *R. stylosa* / *A. marina* (closed canopy, mixed) was allocated where either species contributed approximately between 20% to 80% of the mangrove stand.	
Algal Mat	Algal mats are typically green to grey or black, and either contiguous or fragmented and they vary greatly in desiccation status, which is largely dependent on frequency of inundation relative to timing of surveys. Six species were identified in the Proposal LAUs, with filamentous cyanobacteria *Lyngbya* sp. then *Coleofasciatus chthonoplastes* and *Schizothrix* spp. the dominant species. ***Note: Algal mats included within samphire habitat are not considered with this category.***	
Samphire incl algal mat (sparse)	Open samphire flats, including algal mats. Sparse level of cover (< 50%).	

BCH Class	Description (Area)	Example Image
Samphire incl algal mat (dense)	Open samphire flats, including algal mats. Dense level of cover (>50%).	
Samphire shrublands (sparse)	Samphire shrublands. Sparse level of cover (< 50%).	
Samphire shrublands (dense)	Samphire shrublands. Open samphire flats, including algal mats. Dense level of cover (>50%).	

BCH Class	Description (Area)	Example Image
Bare Intertidal Habitat	Sandy beaches Sandy beaches are typically flat, low energy, low profile beaches backed by gently rising dunes.	
	Mudflat / Saltflat Mudflat/Saltflats are extremely low in biodiversity and support little to no fauna or flora due to their characteristic high salinities. They typically occur on the higher intertidal gradients on the landward extent of Samphire's or Algal Mats.	
	Rock platform Fringing rock platform with occasional very sparse cover of turf algae. Occurs within the wave zone along some of the beaches in the west of Regnard Bay and around Gnoorea Point.	
Mixed Intertidal	Intertidal area with no dominant habitat class	

BCH Class	Description (Area)	Example Image
Subtidal BCH		
Macroalgae Dominated Habitat	Area of macroalgae with low (3 – 10%) to dense (> 75%) coverage. Growing on both unconsolidated (sand / mud) and consolidated (boulders, gravel, rock) substrates.	
Seagrass with macroalgae	Sparse to low seagrass cover (*Halophila*), interspersed with low/moderate brown macroalgae occurring on predominantly sand substrate with patches of sandy veneer on limestone pavement.	
Seagrass with Filter feeders	Habitat dominated by seagrass of elliptical (*Halophila sp.*) or strap-like form (*Halodule sp., Thalassia sp., Syringodium sp., Cymodocea sp.*) with low (3-10%) to dense (>75%) coverage, growing on sandy substrate, occasional sparse/very sparse hard corals/filter feeders.	

BCH Class	Description (Area)	Example Image
Filter Feeder Dominated Habitat	Filter feeders (sponges, sea whips, gorgonians, sea fans, feather stars, ascidians) with low (3 – 10%) to dense (> 75%) coverage, generally growing over sand, rubble, reef with sand veneer, or exposed reef.	
Filter feeders with Pinna bicolor beds	*Pinna bicolor* beds, observed in shallow to moderate depths, typically associated with areas of hard substrate and sand veneer. These beds provide structural habitat for a range of other benthic organisms	
Hard Coral Habitat	Hard and soft corals of varied forms growing on rocky reef with flat to moderate (1 – 3 m) relief, or rubble.	

BCH Class	Description (Area)	Example Image
Unvegetated Soft Sediment	Areas of bare substrate, devoid of biota. Predominantly unconsolidated (sand / mud), but also includes instances of consolidated substrates.	
Mixed Subtidal Habitat	Subtidal area with no dominant habitat class. Areas of mixed assemblages generally comprising of seagrass (*Halophila sp.*, *Halodule sp., Thalassia sp., Syringodium sp., or Cymodocea sp.*) generally growing over sand, and or macroalgae (brown and other macroalgae), filter feeders (sponges, hydroids, and sea whips) and/or hard and soft coral, generally growing over rocky reef with flat to high (> 3 m) relief, or rocky rubble.	

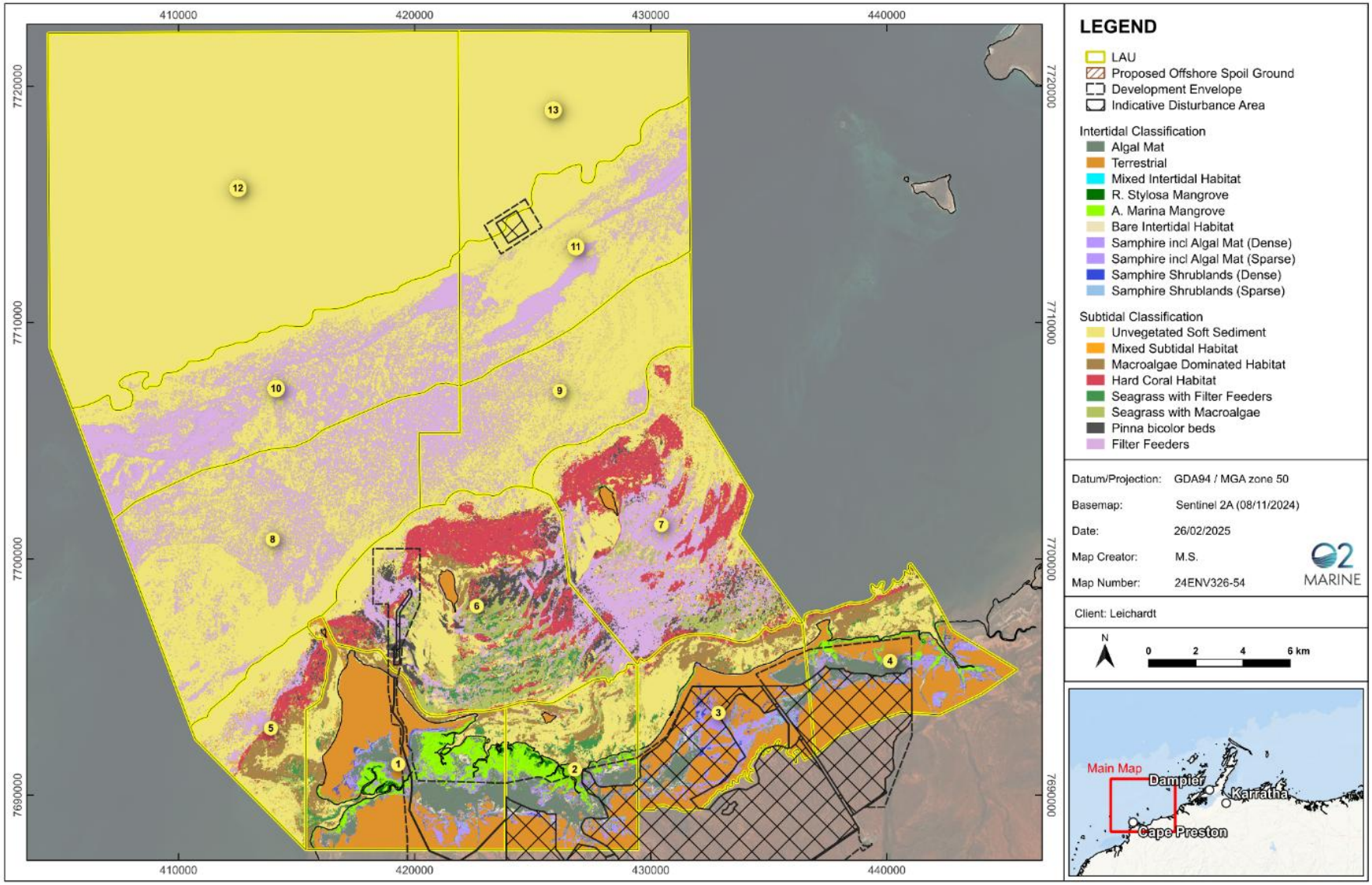


Figure 14: BCH of the Proposal coastline