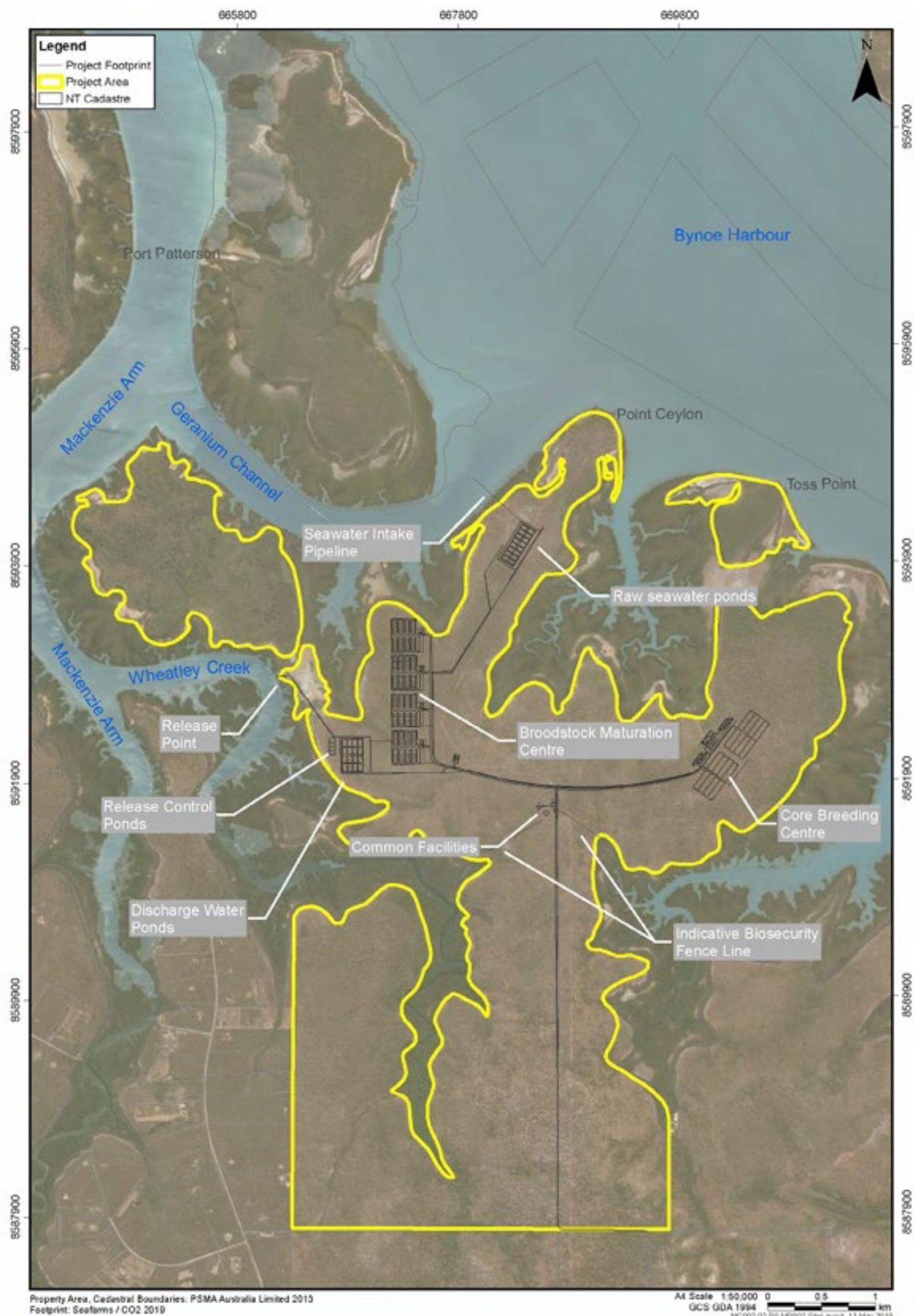
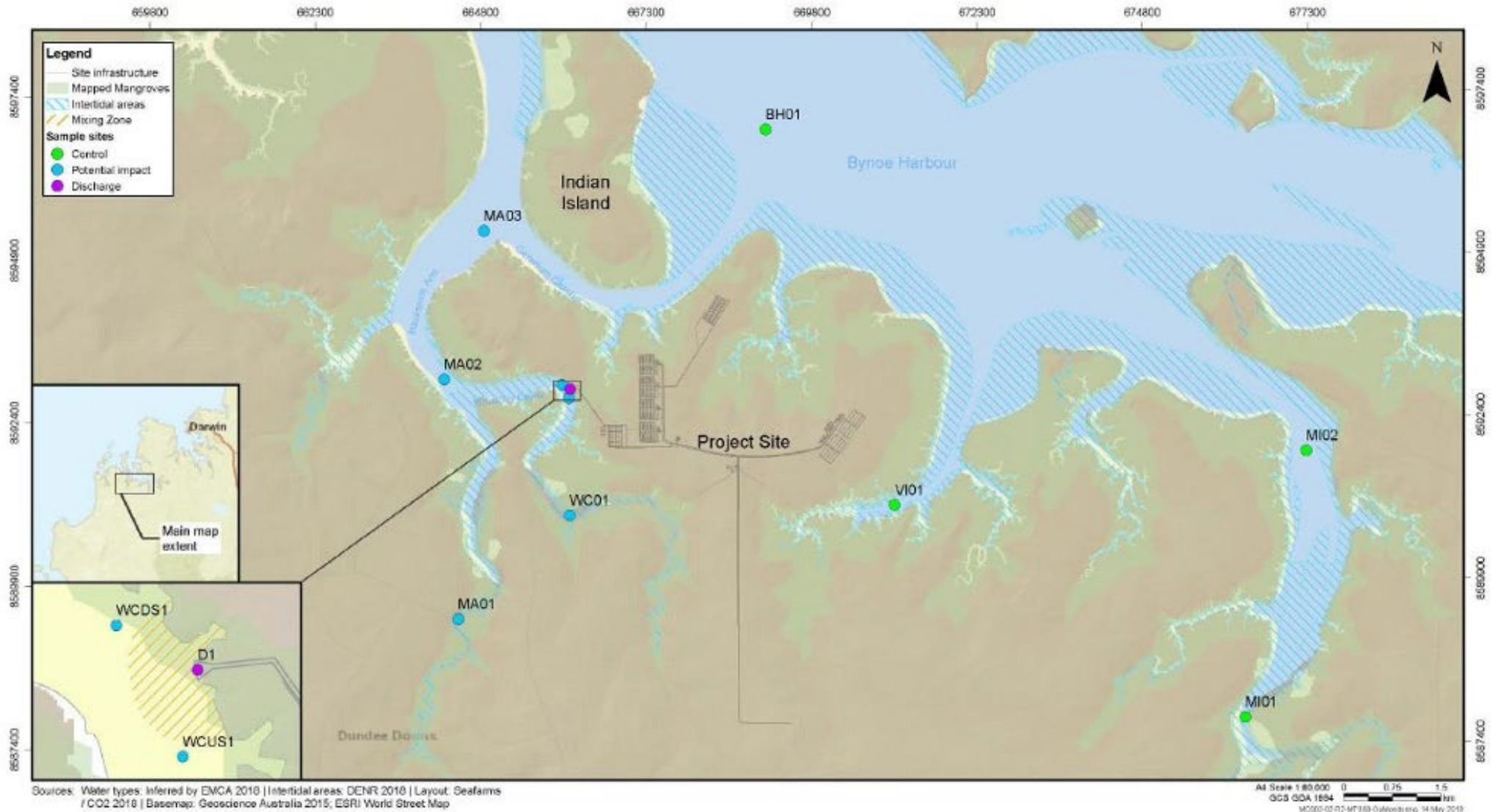


ATTACHMENT A – SITE LAYOUT – RELEASE POINT IS AUTHORISED DISCHARGE POINT



ATTACHMENT B: LOCATION OF IMPACT MONITORING PROGRAM SAMPLING SITES AND AUTHORISED DISCHARGE POINT D1



ATTACHMENT C – MONITORING REQUIREMENTS AND DISCHARGE LIMITS FOR AUTHORISED DISCHARGE POINT

		Authorised Discharge Points		
		DP1 ¹		
		-12.724254		
		130.530041		
Parameter	Unit	Monitoring Frequency	Discharge Limits ³	
			Median	Maximum
Field Measurements				
Flow (Stage 1)	ML/day	C	-	3
Flow (Stage 2)	ML/day	C	-	12.5
Flow timing ¹	-	C	-	-
pH	pH units	M	-	-
Electrical Conductivity (EC)	µS/cm	M	-	-
Dissolved Oxygen (DO)	% saturation	M	-	-
Temperature (T)	°C	M	-	-
Turbidity (NTU)	NTU	M	-	-
Free Chlorine Residue (Cl ₂)	mg/L	M	-	0.1 ⁴
Laboratory Parameters				
Total Suspended Solids (TSS)	mg/L	M	-	-
Total Nitrogen (TN) ^{2,3}	mg/L	M	2.0	5.0
Total Phosphorous (TP) ^{2,3}	mg/L	M	0.4	0.6
Chlorophyll-a (Chl-α) ^{2,3}	µg/L	M	20	200

Key	
-	Not applicable
C	Continuous monitoring of discharge flow volumes and discharge parameters when discharge is occurring from DP1.
M	Monitoring must be conducted on a monthly basis when the discharge is occurring from DP1.
	¹ Timing of authorised discharges commence from mid to high tide, staged over two discharge cycles per day.
	² Discharge flow limits at the outfall into Wheatley Creek as adopted in NTEPA Assessment Report 81 (Recommendation 4).
	³ The discharge limits for TN, TP, Chl-a, TSS are adopted from the numerical modelling for the receiving waters. These discharge limits apply to DP1 and are considered suitable to protect the existing values of the receiving waters through maintenance of existing water quality as per the AWQG. (Refer Table 9-1 WQMMP).
	⁴ A marine low reliability value for total residual chlorine of 0.003 mg/L is nominated in the AWQGs, although this relates to receiving waters rather than discharges. Given the available dilution in the receiving environment, a level of <0.1 mg/L (i.e. non-detectable in a standard test kit) is expected to be a suitable 'non-detect' level and is adopted for the purposes of the WQMMP.

Site Code	Source
DP1	Discharge Point 1 Receives Project discharges via a high-density polyethylene (HDPE) discharge pipeline connecting the CBC/BMC and settlement ponds to a discharge outfall structure at Wheatley Creek. The outfall structure extends the HDPE discharge pipe over the embankment to a constructed rock mattress on the low tide mark. The Stage 2 Project will establish a series of release control ponds to increase the holding area until discharge water is of a quality that can be released into Wheatley Creek.

ATTACHMENT D – ENVIRONMENTAL IMPACT MONITORING PROGRAM

Site Code Description Latitude Longitude		Authorised Monitoring Points											
		Wheatley Creek Sites			Mackenzie Arm Sites			Control Sites					
		WC01 ⁸	WCUS1 ⁸	WCDS1 ⁸	MA01 ⁸	MA02 ⁸	MA03 ⁷	BH01 ⁷	VI01 ⁸	MI01 ⁸	MI02 ⁷		
		Upstream	Upstream Mixing Zone	Downstream Mixing Zone	Upstream	Junction with Wheatley Creek	Downstream	Bynoe Harbour Main Channel	Vigilant Inlet Upper Estuary	Milne Inlet Upstream	Milne Inlet Upstream		
		-12.7417	-12.7255	-12.7236	-12.7560	-12.7229	-12.7022	-12.6882	-12.7403	-12.7696	-12.7327		
		130.5300	130.5299	130.5289	130.5125	130.5125	130.5180	130.5572	130.5752	130.6241	130.6326		
Parameter	Unit	Monitoring Frequency										Trigger Values ⁶	
												Mid-Estuary ⁷	Upper Estuary ⁸
Field Measurements													
pH ¹	pH units	MS	M	MS	MS	MS	MS	MS	MS	MS	MS	7.0-8.5	6.0-8.5
Dissolved Oxygen (DO)	% saturation	M	M	M	M	M	M	M	M	M	M	80-100	
Electrical Conductivity (EC)	µS/cm	M	M	M	M	M	M	M	M	M	M	-	-
Temperature (T)	°C	M	M	M	M	M	M	M	M	M	M	-	-
Turbidity (NTU)	NTU	M	M	M	M	M	M	M	M	M	M	3.9	8.1
Redox Potential ¹	mV	S	S	S	S	S	S	S	S	S	S	-	-
Laboratory Parameters													
Total Suspended Solids (TSS)	mg/L	M	M	M	M	M	M	M	M	M	M	20	
Total Nitrogen (TN) ¹	mg/L	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.27	0.3
Ammonia (NH ₃)	mg/L	M	M	M	M	M	M	M	M	M	M	0.02	
Nitrogen Oxides (NOx)	mg/L	M	M	M	M	M	M	M	M	M	M		
Nitrite (NO2)	mg/L	M	M	M	M	M	M	M	M	M	M	-	-
Nitrate (NO3)	mg/L	M	M	M	M	M	M	M	M	M	M	-	-
Total Kjeldahl Nitrogen (TKN)	mg/L	M	M	M	M	M	M	M	M	M	M	-	-
Total Phosphorous (TP) ¹	mg/L	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.05	0.06
Filterable Reactive Phosphorous (FRP)	mg/L	M	M	M	M	M	M	M	M	M	M	0.005	0.01
Chlorophyll-a (Chl-α)	µg/L	M	M	M	M	M	M	M	M	M	M	2	4
Total Organic Carbon (TOC) ¹	µg/L	S	S	S	S	S	S	S	S	S	S	-	-
Total Aluminium (AL) ¹ (Filtered 0.45µm)	µg/L	S	S	S	S	S	S	S	S	S	S	-	-
Ecological Monitoring ¹													
Sediment size ¹	-	S	S	S	S	S	S	S	S	S	S	-	-
Benthic Macro-invertebrates ²	-	A	A	A	A	A	A	A	A	A	A	-	-
Mangroves ³	-	Y2	Y2	Y2	Y2	Y2	Y2	Y2	Y2	Y2	Y2	-	-
Seagrass ⁴	-	A	A	A	A	A	A	A	A	A	A	-	-
Benthic Habitat ⁵	-	A	A	A	A	A	A	A	A	A	A	-	-

Key	
-	Not applicable.
A	Monitoring must be conducted on an annual basis following first commencement of operational discharges from authorised discharge point (DP1).
Y2	Monitoring must be conducted every two years following first commencement of operational discharges from authorised discharge point (DP1).
M	Monitoring must be conducted on a monthly basis when the discharge is occurring from DP1. Water quality grab sampling according to the methods outlined in AS/NZS 5667.1 - <i>Water quality</i> (from ~30cm depth in the water column)
S	Sediment sampling parameters to be conducted on an annual basis in accordance with AS/NZS 5667.12 - Water quality - Sampling, Part 12: Guidance on sampling of bottom sediments, Simpson & Batley (2016) and a sediment core of 2 cm depth, and recommendations 2 and 3 of Munksgaard (2013).
MS	Denotes parameters to be monitored on a Monthly basis, and parameters for sediment monitoring to be conducted on an annual basis .

¹ Sediment and ecological monitoring - A departure of >1 standard deviations in the baseline data that indicates impact requires further investigation to determine whether an ecologically significant impact is occurring due to site operations.

² At least once prior to operational discharges commencing. Benthic macro-invertebrates, collected from the same sites as the sediment samples in the dry season. Seagrass and macroinvertebrates – methods comparable with DES (2018), with seagrass monitoring to target seagrass density and species present and macroinvertebrates for abundance and taxonomic richness.

³ Mangrove community composition and health at sites adjacent to EIMP monitoring sites Mangrove assessments will utilise multi-spectral imagery / NDVI metrics to assess extent, health and intactness, with ground truthing to confirm findings, comparable to DES (2018) – refer to Cardno (2013) and others as needed. Two (2) wet and two (2) dry satellite imagery analyses, with at least one ground-truthed prior to operational discharge commencing.

⁴ Observations for seagrass at species level, and incidental macroinvertebrate cover observations, to be made at the same locations. Seagrass assessment to be conducted using methods comparable with DES (2018) to target seagrass density and species present.

⁵ At least once prior to operational discharges commencing. Benthic macro-invertebrates, collected from the same sites as the sediment samples. Assess abundance and taxonomic richness.

⁶ Derived from the Darwin Harbour Water Quality Objectives (DWHQO) and interim site specific guideline values as defined in Table 5-1: Interim Receiving Water Quality Guideline Values (EN02-MN4201, WQMMP Revision: 1). For the purpose of this environment protection licence, the guideline values are referred to as trigger values. Monitoring location BH01 is representative of Mid-Estuary and VI01 Upper Estuary (Table 7-1)

⁷ Mid-Estuary trigger values apply to these monitoring locations.

⁸ Upper Estuary trigger values apply to these monitoring locations.