Water Monitoring Report

February 2022 – February 2023

Dorian Rondot

Barramundi Adventures Darwin Pty Ltd

02/03/2023

Summary

This report contains the results of water quality monitoring conducted by Barramundi Adventures Darwin for the reporting period Feb2022-Feb2023. Barramundi Adventures Darwin operates as a recreational barramundi fishing park as well as conducting trials for extensive tiger prawn farming. Due to the low intensity and small scale of operation, discharge levels into the Blackmore River are low and only occur during the wet season when rainfall causes overflow of surface water from the ponds. In relation to EPL323, water sampling occurred mainly at Monitoring Points of the Blackmore River and during a discharge event from the Authorised Discharge point A. Results of these samples are discussed below.

Purpose

This Monitoring Report is prepared in accordance with the following EPL232 conditions:

Condition 41 *The licensee must complete and provide to the NT EPA a Monitoring Report, as prescribed by this licence, within 10 business days after each anniversary date of this licence.*

Condition 42 *The licensee must ensure that each Monitoring Report:*

- *is prepared in accordance with the requirements of the NT EPA 'Guideline for Reporting on Environmental Monitoring'*
- *includes a tabulation of all monitoring data required as a condition of this licence*
- *includes long term trend analysis of monitoring data to demonstrate any environmental impact associated with the activity over a minimum period of three years (where the data is available)*
- *includes an assessment of environmental impact from the activity*

Monitoring plan

The monitoring plan includes four sampling locations (Fig. 1). These locations are;

BM – is located at the mouth of the tributary where the farm discharge meets the Blackmore River.

BM South – Approximately 100m upstream of where the farm discharge meets the Blackmore River.

BM North – Approximately 500m downstream of where the farm discharge meets the Blackmore River.

DP A – is the Authorised Discharge located at the southern end of the farm.

Water quality monitoring of the Blackmore River was carried out at three times throughout the year. Samples were sent to NATA accredited laboratories for analysis for all parameters listed according to the Water Quality Monitoring Program.

Sample from the DP A was only collected when water was available to sample, i.e. during the wet season when rainfall resulted in surface water overflowing from the pond outlets into the discharge channel.

Field parameters, temperature, pH, dissolved oxygen, electrical conductivity and turbidity were measured in-situ using a YSI pro quatro handheld meter.

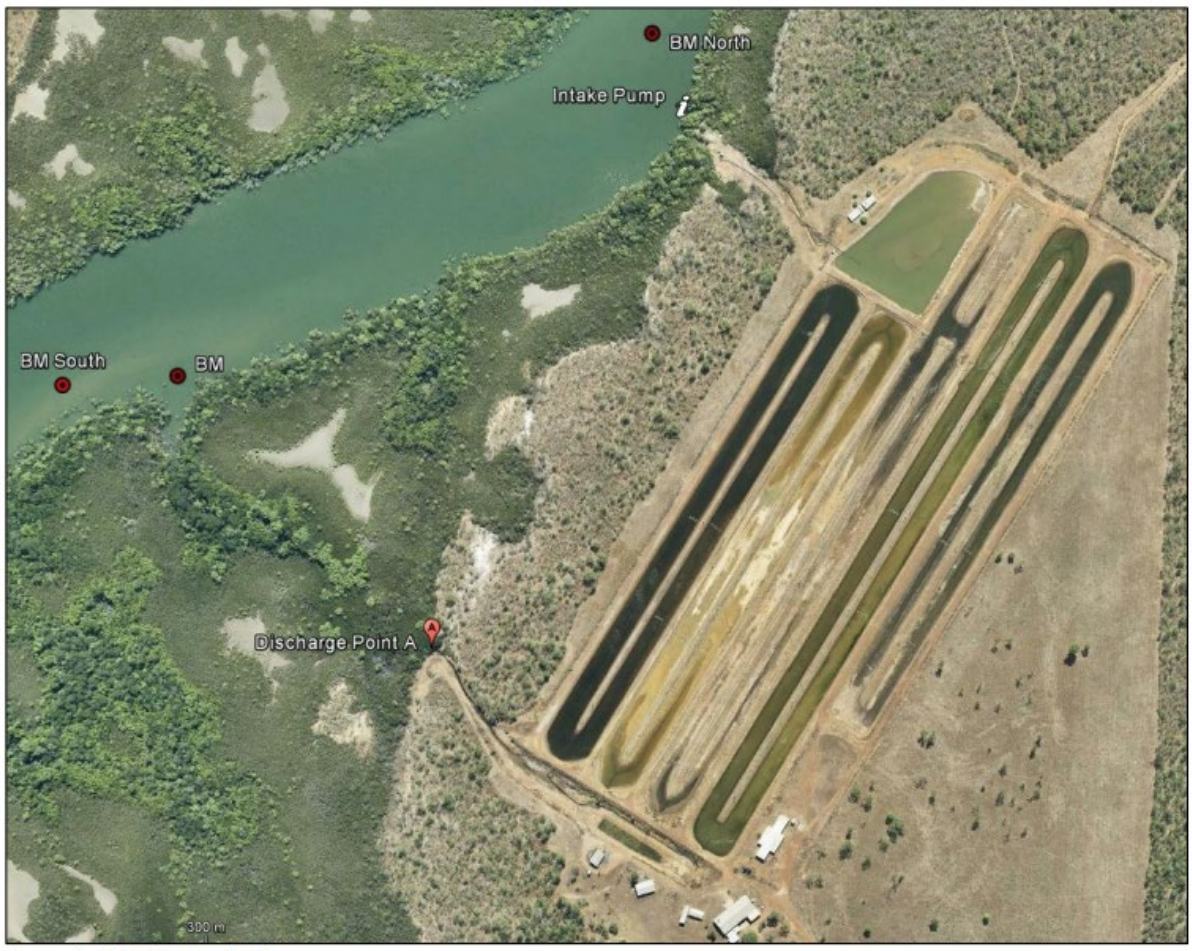

Figure 1 – Monitoring Points

Field parameter results

Table 1: Monitoring data of field parameters

Site ID	Date Sampled	Temp	DO	pH	EC	Turbidity
		°C	%sat	pH units	µS/cm	NTU
		-	75-100	6.0-8.5	-	-
BM	27/07/2022	23.7	56	7.73	46981	7.64
BM South	27/07/2022	23.8	59	7.70	46604	7.36

BM North	27/07/2022	23.8	65	7.75	46944	6.39
BM	28/09/2022	31.4	83	7.66	62170	20.4
BM South	28/09/2022	31.5	90	7.69	62422	22.7
BM North	28/09/2022	31.5	90	7.67	61980	16.6
BM	7/02/2023	31	60.8	7.52	27851	3.78
BM_South	7/02/2023	30.9	61.6	7.51	23218	3.8
BM_North	7/02/2023	31	66.1	7.48	26292	3.66
DP_A	7/02/2023	32.4	66.8	7.99	29624	7.59

Laboratory parameters

Table 2: Monitoring data of nitrogen-based nutrients

Site ID	Date Sampled	Ammonia as N	Nitrate as N	Nitrite as N	NOx as N	TN
		mg/L	mg/L	mg/L	mg/L	mg/L
		0.026	-	-	-	0.3
BM	27/07/2022	0.015	<0.005	<0.005	<0.005	0.1
BM South	27/07/2022	0.014	<0.005	<0.005	<0.005	0.1
BM North	27/07/2022	0.009	<0.005	<0.005	<0.005	0.1
BM	28/09/2022	0.150	0.16	<0.01	0.16	<1.0
BM South	28/09/2022	0.280	0.23	<0.01	0.23	<1.0
BM North	28/09/2022	0.280	0.47	<0.01	0.47	<1.0
BM	7/02/2023	<0.005	<0.005	<0.005		0.1
BM_South	7/02/2023	<0.005	<0.005	<0.005		0.1
BM_North	7/02/2023	<0.005	<0.005	<0.005		0.1
DP_A	7/02/2023	<0.005	0.02	0.023		1

Table 3: Monitoring data of other laboratory parameters

Site ID	Date Sampled	BOD	TSS	PO4 as P	TP	Chl-a
		mg/L	mg/L	mg/L	mg/L	mg/m3
		-	10	0.009	0.03	2
BM	27/07/2022	<5	7	0.010	0.04	3
BM South	27/07/2022	<5	8	0.009	0.05	1
BM North	27/07/2022	<5	6	0.010	0.05	2
BM	28/09/2022	<2	13	-	0.58	2
BM South	28/09/2022	<2	26	-	<0.10	1
BM North	28/09/2022	<2	24	-	0.15	1
BM	7/02/2023	6	8	<0.005	0.04	1
BM_South	7/02/2023	<5	12	<0.005	0.04	4
BM_North	7/02/2023	<5	6	<0.005	0.03	4
DP_A	7/02/2023	7	12	<0.005	0.1	40

Rainfall and discharge volumes

Table 4 outlines the estimated discharge volumes that occur throughout the year based on rainfall and evaporation data. Discharge only occurs between December 2022 and February 2023 due to rainfall and surface water overflowing from the ponds. Note that ponds 1, 2 & 4 were only in use from November 2022 and water levels were low enough to withstand rainfall events and therefore there was no overflow from these ponds during the reporting period. Overflow, commenced from February 2023. Total discharge volume for this reporting period was 41.3 ML.

Table 4: Estimates of discharge volumes based on rainfall and evaporation data (BOM).

Overflow	Av. Rainfall (mm)	Av. Evaporation (mm)	Rainfall – Evaporation (mm)	Increase or decrease in water volume per pond 5 (ML)	Increase or decrease in water volume per pond 3 (ML)	Overflow discharge for all ponds (ML)
Jan	431.3	182.5	248.8	6.2	7.5	13.7
Feb	369	159.5	209.5	5.2	6.3	11.5
Mar	310.8	175.6	135.2	3.4	4.1	11.5
Apr	101.7	189.1	-87.4	-2.2	-2.6	-
May	20.4	209.6	-189.2	-4.7	-5.7	-
Jun	1.8	201.7	-199.9	-5.0	-6.0	-
Jul	1.1	211.9	-210.8	-5.3	-6.3	-
Aug	4.6	224.4	-219.8	-5.5	-6.6	-
Sep	16.6	232.3	-215.7	-5.4	-6.5	-
Oct	70.2	243.5	-173.3	-4.3	-5.2	-
Nov	141.8	217.3	-75.5	-1.9	-2.3	-
Dec	252	197.8	54.2	1.4	1.6	4.6
Total Annual	1723.8	2444.1	-720.3	-18.1	-21.7	41.3

Discussion of water quality monitoring

Monthly sample collection from the Monitoring Points in the Blackmore River did not occur due to there being no discharge from the farm for majority of the reporting period. In addition, monthly sample collection of the Blackmore River (EPL276 within 2km of the present monitoring points) was already being carried out and this data could be used to determine site specific trigger values. Discharge did occur during the recent wet season (January 2023) and a sample was collected from DP A during this event that also coincided with the ability to collect samples from the Monitoring Points. Note, water sampling opportunities from the Monitoring Points are limited by tide access, sample withholding periods and freight timelines.

A number of parameters from the Monitoring Points during the reporting period exceeded the trigger values. This included dissolved oxygen (DO), ammonia, total Nitrogen, phosphorus, suspended solids and chlorophyll a. Elevated levels of these nutrients were detected at the Monitoring Points despite there being no discharge from the farm during two of the sampling events. This suggests background levels of nutrients within the Blackmore River throughout the year are varied and new site-specific trigger values are reflected within the amended EPL323-01.

Elevated nutrients were found in water samples from the DP A in February 2023 during the discharge event. However, these do not appear to impact the levels detected at the Monitoring Points, particularly at BM where the DP A meets the Blackmore River. This is likely due to the low volumes of water being discharged from BAD relevant to the size of Blackmore River and Darwin Harbor catchments.

Declaration

I Dorian Rondot of Barramundi Adventures Darwin Pty Ltd prepared this report and I confirm to the best of my knowledge and ability that all information provided in this report is true and accurate.

SIGNATURE

02/03/2023