

5 December, 2023

Ingenia
Suite 1, 257 Gympie Road
Kedron, QLD - 4031.
Attention: Krystal Bourke

Dear Nathan,

RE: MERRY BEACH CARAVAN PARK, MONTHLY REVIEW OF LABORATORY RESULTS – SEWAGE TREATMENT AND REUSE SYSTEM – OCTOBER 2023

Further to recommendations in Merry Beach Annual Monitoring Report find below the monthly review of monitoring data for October 2 to November 5, 2023.

1. Collection of water samples

Water samples for selected monitoring points were collected on the following dates:

- o November 1 – Eff1, Eff2 and Influent.
- o Drinking water samples from Beach Front Tank, Creek Tanks, Main Tank, Top Toilet Tank and Pretty Beach Tank were not provided for October.
- o Due to staffing issues Eff2 residual free chlorine has was only tested onsite on November 4.

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2. Review of monitoring results against POEO Act Environmental Protection License 5888 conditions

1. Effluent 1 (Eff1) (Monitoring Point 2)

Laboratory results were reviewed against License 5888 conditions for Eff1 (Monitoring Point 2), results are summarised in Table 1. Conclusions regarding Eff1 are:

- Laboratory results for Eff1 indicate license conditions were exceeded for faecal coliforms during October. Please ensure the UV unit tubes are cleaned monthly and UV lamps are check and replaced in accordance with manufacture's specifications. Alternatively, manual / automatic chlorination of effluent after decanting may also be trialled.
- All other laboratory results for Eff1 were within license conditions during October.

Table 1: Review of monitoring results for Eff1 against License 5888 conditions.

Chemical	Units	License 5888 Conditions – Eff1 (Point 2)			Sampling Date 2023	
		50 percentile concentration limit	90 percentile concentration limit	100 percentile concentration limit	November 1	Complies?
BOD	mg/L		20	30	2	✓
Faecal coliforms (FC)	CFU/100 mL	25		150	320	✗
Nitrogen (total)	mg/L		10	15	12.5	✓
Oil and grease	mg/L	1.5		5	< 5	✓
pH	pH units			6.5 – 8.5	7.49	✓
Phosphorous (total)	mg/L	5.5		10	6.81	✓
Total suspended solids (TSS)	mg/L		10	20	<5	✓

2. Reuse Effluent (Eff2) (Monitoring Point 6)

Laboratory results were reviewed against License 5888 conditions for Eff2 (Monitoring Point 6), results are summarised in Table 2. Conclusions regarding Eff2 are:

- Onsite testing results for free residual chlorine was tested on 4 November 2023 with results shown in Table 2. Further comment is provided below.
- Laboratory results for Eff2 indicate license conditions were exceeded for E. coli during October. Please ensure onsite testing results of free residual chlorine is conducted weekly. Results should be >2 mg/L, this will assist in management of E. coli observed in Eff2.
- All other laboratory results for Eff2 were within license conditions during October.

Table 2: Review of monitoring results for Eff2 against License 5888 conditions.

Chemical	Units	License 5888 Conditions – Eff2 (Point 6)			Sampling Dates 2023	
		50 percentile concentration limit	90 percentile concentration limit	100 percentile concentration limit	November 1	Complies?
Chlorine (free residual) (onsite testing) ¹	mg/L			> 2	2.02	✓
E. coli	CFU/100 mL			2	20	✗
pH	pH units			6.5 – 8.5	7.88	✓
Total suspended solids (TSS)	mg/L			< 5	<5	✓

Notes

- Free residual chlorine was tested onsite on 4 (2.02 mg/L), November 2023; Chlorine average shown above (Table 2).

MA notes that due to staffing issues, onsite free residual chlorine was only sampled once on 4 November 2023. Based on limited information provided, onsite free residual chlorine sampling from October 2023 is non-compliant with license conditions. Site process is to ensure that whenever onsite chlorine results are <2.0 mg/L, chlorine is manually dosed and effluent is retested before transfer.

This in conjunction with E. coli exceedances observed in Eff2 MA recommend recommencement of onsite free residual chlorine testing to be undertaken immediately in accordance with license conditions.

As recommended previously, the pH in the effluent is above 7 which may impact on the disinfection effectiveness of chlorine as well as the effectiveness of alum dosing for phosphorus removal. We recommend pH in the STP be manually adjusted daily to maintain pH between 6.5 and 7.0 using pool acid.

3. Drinking water supply tank testing

Laboratory results were not provided for October 2023. MA recommends sampling be undertaken immediately to establish the water quality of drinking water at the site.

**For and on behalf of
MARTENS & ASSOCIATES PTY LTD**



TRYSTAN RICHARDS
Environmental Consultant

DAILY MONITORING RECORD – MERRY BEACH CARAVAN PARK SEWAGE TREATMENT AND RE-USE SCHEME

Start Date: 2.10.23

Finish Date: 8.10.23

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	10:00	10:30	10:30	9:30	1:00		
Meter 1 Reading MAGFLOW (L)	41 354	52 381	45 869	40 580			
Meter 2 Reading (KL) – Non-Potable RU	18 983	18 994	18 999	19 002	19 006		
Meter 3 Reading (KL) – Irrigation	97 819	97 872	97 978	98 025	98 081		
Meter 4 Reading (KL) – NPWS	37 952	37 952	37 952	37 952	37 952		
Meter 5 Reading (KL) - DLWC	27 398	27 398	27 398	27 398	27 398		
Pump Well Effluent Appearance	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY
STP Status	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED
UV Lamp Status	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED
Chlorination System Status	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY
Irrigation Field Status	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING
Weather Conditions	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN
Dissolved Oxygen (DO) in IDEA / anoxic reactors	2.8 / 0.13	2.6 / 0.14	1.8 / 0.13	2.2 / 0.13	3.0 / 0.12	/	/
pH in IDEA reactor / EFF1 / EFF2	7.2 / 7.1 / 7.3	7.2 / 7.2 / 7.4	7.3 / 7.3 / 7.4	7.4 / 7.3 / 7.4	7.3 / 7.2 / 7.3	/ /	/ /
Total Alkalinity in IDEA Reactor (mg/L)	410 mg/L		460 mg/L		390 mg/L		
30 minute sludge volume (%)	65%		65%		55%		
Weekly chlorine testing EFF1 and EFF2	/	/	/	/	/	/	/
Initials	py	py	py	py	CFE		

DAILY MONITORING RECORD – MERRY BEACH CARAVAN PARK SEWAGE TREATMENT AND RE-USE SCHEME

Start Date: 23 - 10 - 23

Finish Date: 28 - 10 - 23

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings			2.15	11.45	11.10	12.50	3.20
Meter 1 Reading MAGFLOW (L)			11867	16681		30898	38487
Meter 2 Reading (KL) – Non- Potable RU			19066	19066	19073	19077	19081
Meter 3 Reading (KL) – Irrigation			98563	98563	98613	98613	98663
Meter 4 Reading (KL) – NPWS			37952	37952	37952	37952	37952
Meter 5 Reading (KL) - DLWC			27398	27398	27398	27398	27398
Pump Well Effluent Appearance	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY
STP Status	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED
UV Lamp Status	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED
Chlorination System Status	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY
Irrigation Field Status	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING
Weather Conditions	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN
Dissolved Oxygen (DO) in IDEA / anoxic reactors	/	/	3.1 10.13	3.9 10.14	3.9 10.11	4.58 10.05	3.56 10.04
pH in IDEA reactor / EFF1 / EFF2	/ /	/ /	7.6 7.7 7.6	7.8 7.9 7.7	7.9 7.1 7.7	7.92 7.76 7.85	7.86 7.19 7.86
Total Alkalinity in IDEA Reactor (mg/L)			390 mg/L	15 LBS Acid	410 mg/L	268 mg/L	255 mg/L
30 minute sludge volume (%)			98%	ADDED	98%	98%	98%
Weekly chlorine testing EFF1 and EFF2	/	/	/	/	/	0.021	/
Initials			EFF	EFF	EFF	Nathan	Nathan



DAILY MONITORING RECORD - MERRY BEACH CARAVAN PARK SEWAGE TREATMENT AND RE-USE SCHEME

Finish Date: 5-11-23

Start Date: 30-10-23

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	120	1145	3.00	1.00	1.15	1.00	12.45
Meter 1 Reading MAGFLOW (L)	9,035	0	18678	36576	22092	52922	37545
Meter 2 Reading (KL) - Non-Potable RU	19083	19085	19088	19090	19090	19090	19090
Meter 3 Reading (KL) - Irrigation	098727	98727	98727	98727	98730	98787	98842
Meter 4 Reading (KL) - NPWS	37952	37952					
Meter 5 Reading (KL) - DLWC	27398	27398					
Pump Well Effluent Appearance	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY	CLEAR / CLOUDY / GREY
STP Status	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED
UV Lamp Status	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED	OK / ALARMED
Chlorination System Status	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY	OK / FAULTY
Irrigation Field Status	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING	OK / WET / PONDING
Weather Conditions	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN	SUNNY / CLOUDY / RAIN
Dissolved Oxygen (DO) in IDEA / anoxic reactors	2.79 10.06	3.17 10.08					
pH in IDEA reactor / EFF1 / EFF2	7.4 7.2 7.43	7.57 7.3 6.74	17.4 7.8	17.3 7.9	7.1 7.5 8.1	7.2 7.4 8.0	7.4 7.2 7.9
Total Alkalinity in IDEA Reactor (mg/L)	247 mg/L			265 mg/L			
30 minute sludge volume (%)	98%	98%			95%		
Weekly chlorine testing EFF1 and EFF2						2.15 2.02	
Initials			CFF	CFF	CFF	CFF	CFF

WATER ANALYSIS CHAIN OF CUSTODY

Project:	Merry Beach Monitoring – October 2023	Laboratory:	ALS (Australian Laboratory Services)	Delivery Details	
Sampling Date:		Address:	4/13 Geary Place, North Nowra, NSW 2541	Dispatch Date:	
Our reference:	P2108127	Our Contact:	Gray Taylor	Phone:	(02) 4423 2063
		Contact:		Facsimile:	(02) 4423 2083
				Shipment Method:	

Sample ID	Number of Containers	Analysis Required (X)											
		pH	Conductivity	Suspended Solids	BOD ₅	Phosphorous (total)	Nitrogen (total)	TKN	Ammonia	NOx	Faecal Col.	Enterococci	Oil and Grease
884/Eff1		X		X	X	X	X	X	X	X		X	
884/Eff2		X		X									X
Influent		X		X	X	X	X	X	X	X		X	X

Notes: Fax (02 9476 8767) and email (gtaylor@martens.com.au; trichards@martens.com.au; mail@martens.com.au; young.pete7@gmail.com and merrybeachmgr@ingeniaholidays.com.au) results as soon as available, originals of laboratory reports to be posted to Merry Beach Caravan Park, KIOLOA, NSW, 2539.

3
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1

HT

URGENT



Telephone : + 61-2-8784 8556

Environmental Division
Sydney
Work Order Reference
ES2337812

Ash'd
2/11
0900



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CERTIFICATE OF ANALYSIS

Work Order	: ES2337812	Page	: 1 of 3
Client	: MARTENS & ASSOCIATES PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: GRAY TAYLOW	Contact	: Customer Services ES
Address	: Suite 201 Level 2 20 George Street HORNSBY NSW, AUSTRALIA 2077	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: P2108127 - MERRY BEACH MONITORING - OCTOBER 2023	Date Samples Received	: 02-Nov-2023 09:00
Order number	: ----	Date Analysis Commenced	: 02-Nov-2023
C-O-C number	: ----	Issue Date	: 10-Nov-2023 12:04
Sampler	: ----		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 3		
No. of samples analysed	: 3		



Accreditation No. 825
Accredited for compliance with
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Somlok Chai	Microbiologist	Sydney Microbiology, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- MW006 is ALS's internal code and is equivalent to AS4276.5.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		884/EFF1	884/EFF2	INFLUENT	----	----
Sampling date / time		01-Nov-2023 00:00		01-Nov-2023 00:00	01-Nov-2023 00:00	01-Nov-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2337812-001	ES2337812-002	ES2337812-003	-----	-----
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.49	7.88	7.84	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	<5	298	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.04	----	53.7	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	10.6	----	0.08	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.9	----	74.5	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	12.5	----	74.6	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	6.81	----	16.5	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	<5	----	61	----	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	2	----	83	----	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	320	----	7300000	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL	----	20	7100000	----	----