

30 May, 2024

Ingenia
Suite 1, 257 Gympie Road
Kedron, QLD - 4031.
Attention: Harry Brazil

Dear Harry,

RE: MERRY BEACH CARAVAN PARK, MONTHLY REVIEW OF LABORATORY RESULTS – SEWAGE TREATMENT AND REUSE SYSTEM – MAY 2024

Further to recommendations in Merry Beach Annual Monitoring Report find below the monthly review of monitoring data for April 29 to May 26, 2024.

1. Collection of water samples

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

- o May 16 – Eff1, Eff2 and Influent.
- o May 16 - Drinking water samples from Beach Front Tank, Creek Tanks and Main Tank. Top Toilet Tank and Pretty Beach Tank had no water.
- o In accordance with revised license conditions, Eff2 residual free chlorine was tested onsite on May 4, 11, 18 and 25

World Class Sustainable Engineering Solutions

Environmental

EIS & REF
Streams & rivers
Coastal
Groundwater
Catchments
Bushfire
Monitoring

Geotechnics

Foundations
Geotechnical survey
Contamination
Hydrogeology
Mining
Terrain analysis
Waste management

Water

Supply & storage
Flooding
Stormwater & drainage
Wetlands
Water quality
Irrigation
Water sensitive design

Wastewater

Treatment
Re-use
Biosolids
Design
Management
Monitoring
Construction

Civil

Earthworks
Excavations
Pipelines
Roads
Pavements
Parking
Structures

Head Office

Suite 201, 20 George St
Hornsby NSW 2077, Australia
Ph 02 9476 9999 Fax 02 9476 8767

> mail@martens.com.au
www.martens.com.au
MARTENS & ASSOCIATES P/L
ABN 85 070 240 890 ACN 070 240 890

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 nitrogen (total) during May. This is historically 'typical' occurrence.
- Laboratory results for Eff1 indicate pH was outside the accepted range for May 2024. MA recommends investigating pH of Eff1 and source water using pH probe.
- All other laboratory results for Eff1 were within license conditions during May.

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

Chemical	Units	License 5888 Conditions – Eff1 (Point 2)			Sampling Date 2024	
		50 percentile concentration limit	90 percentile concentration limit	100 percentile concentration limit	May 16	Complies?
BOD	mg/L		20	30	<2	✓
Faecal coliforms (FC)	CFU/100 mL	25		150	<1	✓
Nitrogen (total)	mg/L		10	15	24.1	✗
Oil and grease	mg/L	1.5		5	< 1	✓
pH	pH units			6.5 – 8.5	3.71	✗
Phosphorous (total)	mg/L	5.5		10	0.22	✓
Total suspended solids (TSS)	mg/L		10	20	<5	✓

3. 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, 11, 18 and 25 May 2024 with results shown in Table 2. Further comment is provided below.
- Laboratory results for Eff2 indicate TSS license conditions were exceeded during May 2024. This is a minor exceedance and therefore MA recommends filters be removed, cleaned and inspected to ensure proper operation.

- Laboratory results for Eff2 indicate pH outside the accepted range for May 2024. MA recommends investigating pH Eff1 and source water using pH probe.
- All other laboratory results for Eff2 were within license conditions during May.

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

Chemical	Units	License 5888 Conditions – Eff2 (Point 6)			Sampling Dates 2024	
		50 percentile concentration limit	90 percentile concentration limit	100 percentile concentration limit	May 16	Complies?
Chlorine (free residual) (onsite testing) ¹	mg/L			> 2	2.4	✓
E. coli	CFU/100 mL			2	<1	✓
pH	pH units			6.5 – 8.5	4.27	✗
Total suspended solids (TSS)	mg/L			< 5	7	✗

Notes

1. Free residual chlorine was tested onsite on 4 (2.4 mg/L), 11 (2.3 mg/L) 18 (2.4 mg/L) and 25 (2.3 mg/L) May 2024; Chlorine average shown above (Table 2). Onsite free residual chlorine sampling for May 2024 is compliant with license conditions. Site process is to ensure that whenever Eff2 onsite chlorine results are < 2.0 mg/L, chlorine is manually dosed and effluent is retested before transfer.

Noncompliant pH

At this stage it is unclear of the cause of low pH laboratory results. Discussions with site staff revealed no changes in dosing had occurred during May 2024. Additional onsite field testing using pH probe showed all drinking water and Eff1 and Eff2 to be between pH 7 – 8.

4. Drinking water supply tank testing

Laboratory results were reviewed against National Drinking Water Quality Standards for drinking water at multiple tested tanks:

- All sample locations were within the standards for faecal coliforms with results (<1 CFU/100ml) for May 2024
- All sample locations were within the standards for E. coli with results (<1 CFU/100mL) for May 2024.

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

J. Richards

TRYSTAN RICHARDS
Environmental Consultant

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

Start Date: 29.4.24

Finish Date: 5.5.24

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	8:30	10:30	3:00	10:40	12:00	8:00	10:47
Meter 1 Reading MAGFLOW (L)	7660	7682	7700	7713	7803	7822	7894
Meter 2 Reading (KL) – Non-Potable RU	19377	19377	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	106747	106747	106747	106747	106747	106747	106747
Meter 4 Reading (KL) – NPWS	37952	37952	37952	37952	37952	37952	37952
Meter 5 Reading (KL) – DLWC	27398	27398	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 in IDEA reactor (mg/L)	8.3	7.7	8.2	7.04	8.0	8.6	8.1
pH in IDEA reactor / Effluent PW	7.4 / 7.4	7.8 / 7.4	7.9 / 7.6	7.95 / 7.4	7.5 / 7.5	7.6 / 7.6	7.87 / 7.8
Total Alkalinity in IDEA Reactor (mg/L)	180 mg/L		144 mg/L			172 mg/L	
30 minute sludge volume (%)	15%		15%			20%	
Chlorine (residual) onsite testing Eff2 (once per week)						2.4 mg/L	
Initials	py	py	py	lw	py	py	rw



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

Start Date: 6.5.24

Finish Date: 12.5.24

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	10:00	11:30	10:42	10:30	2:00	10:30	11:30
Meter 1 Reading MAGFLOW (L)	7932	7954	7983	8049	8092	8136	8318
Meter 2 Reading (KL) – Non-Potable RU	19377	19377	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	106747	106747	106747	106747	106747	106747	106747
Meter 4 Reading (KL) – NPWS	37952	37952	37952	37952	37952	37952	37952
Meter 5 Reading (KL) – DLWC	27398	27398	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 in IDEA reactor (mg/L)	6.9	7.2	6.99	6.7	7.1	6.1	6.2
pH in IDEA reactor / Effluent PW	7.9 / 7.9	8.18 / 8.2	8.13 / 8.2	8.1 / 8.2	8.1 / 8.2	8.1 / 8.2	7.7 / 7.6
Total Alkalinity in IDEA Reactor (mg/L)	184 mg/L		190 mg		190 mg/L		
30 minute sludge volume (%)	22%		25%		25%		
Chlorine (residual) onsite testing Eff2 (once per week)						2.3 mg/L	
Initials	py	py	py	py	py	py	ML

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

Start Date: 13.5.24

Finish Date: 19.5.24




Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	10:40	1:15	1:00	11:30	11:14	1450	1507
Meter 1 Reading MAGFLOW (L)	8385	8413	8433	8447	8465	8521	8550
Meter 2 Reading (KL) – Non-Potable RU	19377	19377	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	106747	106747	106747	106747	106747	106747	106747
Meter 4 Reading (KL) – NPWS	37952	37952	37952	37952	37952	37952	37952
Meter 5 Reading (KL) – DLWC	27398	27398	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 in IDEA reactor (mg/L)	5.97	7.9	6.15	5.84	5.6	5.78	6.00
pH in IDEA reactor / Effluent PW	7.9 / 7.9	7.4 / 7.5	7.28 / 7.3	7.5 / 7.5	7.5 / 7.6	7.5 / 7.7	7.28 / 7.6
Total Alkalinity in IDEA Reactor (mg/L)	278 mg/L		260 mg/L		158 mg/L		
30 minute sludge volume (%)	25%		35%		35%		
Chlorine (residual) onsite testing Eff2 (once per week)						2.4 mg/L	
Initials	MW	py	py	py	MW	MW	MW

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

Start Date: 20/5/24

Finish Date: 26/5/24

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	0950	10-30	8-30	900	1330	7.52	7.45.
Meter 1 Reading MAGFLOW (L)	8566	8582	8608	8623	8638	8660	8682.
Meter 2 Reading (KL) – Non- Potable RU	19377	19377	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	106747	106747	106747	106747	106747	106747	106747
Meter 4 Reading (KL) – NPWS	37952	37952	37952	37952	37952	37952	37952
Meter 5 Reading (KL) - DLWC	37398	27398	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 in IDEA reactor (mg/L)	5.48	5.84	5.39	5.75	5.89.	5.40	5.05
pH in IDEA reactor / Effluent PW	7.39 /	7.53	7.71	7.4 /	7.6, 7.5	7.75 /	8.20 /
Total Alkalinity in IDEA Reactor (mg/L)	20mg/L						
30 minute sludge volume (%)	25%	30%			35%		
Chlorine (residual) onsite testing Eff2 (once per week)						2.3mg/L	
Initials	MW	B	B	B	LM	py	py

Mandatory Fields		CHAIN OF CUSTODY										Page 1 of 1													
CLIENT CODE: IMGMER		*PROJECT MANAGER: Gray Taylor				SAMPLER: Peter Young						CoC #: (if applicable)													
*CLIENT: INGENIA HOLIDAYS MERRY BEACH		*PM MOBILE: 0422 685 594				SAMPLER MOBILE: 0404 455 064																			
OFFICE: Merry Beach Rd, Kioloa NSW 2539		ALS QUOTE # EW2023INGMER0002 <small>(Client PL if blank)</small>				PURCHASE ORDER NO.: PO501061																			
PROJECT NO./PROJECT: Merry Beach Fresh/ Drinking Water Monthly						SITE:																			
*INVOICE TO: payables@ingeniacommunities.com.au , Merrybeachmgr@ingeniaholidays.com.au , KBourke@ingeniacommunities.com.au												<input type="checkbox"/> CC Invoice to PM		BIOSECURITY											
*EMAIL REPORTS TO: gtaylor@martens.com.au; mail@martens.com.au; young.pete7@gmail.com, Merrybeachmgr@ingeniaholidays.com.au, KBourke@ingeniacommunities.com.au, Bconnolly@ingeniaholidays.com.au, Trichards@martens.com.au, ejongsma@martens.com.au		*ANALYSIS REQUIRED <small>(NB. ALS Quote No. and/or Analysis Suite Codes must be listed to attract suite/quoted price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Mark an X in the boxes below analysis to indicate the parameter listed above to be tested on that sample.</small>										Country of Origin: (if not Australia)		Environmental Division Wollongong Work Order Reference EW2402312  Telephone : 02 42253126											
* STORAGE REQUIREMENTS <small>Please check box.</small> → <small>Standard Storage time from receipt of samples:</small> <small>Waters - 3 weeks Soils - 2 months</small>		<input checked="" type="checkbox"/> Standard Storage <input type="checkbox"/> Extended Storage Specify Disposal Date: <small>Note: Extended storage incurs a fee and requires a signed agreement.</small>		* TURNAROUND <small>Please check box.</small> → <small>(Not all tests can be expedited, contact Client Services for more information)</small>		<input checked="" type="checkbox"/> 5+ days (no surcharge) <input type="checkbox"/> 3 day (+15%) <input type="checkbox"/> 2 day (+30%) <input type="checkbox"/> 1 day (+50%)		MW006 (Ec) - E.coli MW007 - Total Coliforms																	
Comments:																									
ALS Use Only	Sample ID		Depth	Date/Time		No. Bottles	MATRIX: <small>Soil/Solids(S) Water(W) Sediments (SD) Dust (D), Product (P), Biota (B), Biosolid (BS)</small>											Lab QC <small>(additional bottles req.)</small>		Additional Information <small>(Comment on hazards - e.g., asbestos, known high contamination)</small>					
Lab ID																		Dup	MS						
001	Beach Front Tank			10-00, 16/5/24		1	W	X	X											<input type="checkbox"/>	<input type="checkbox"/>				
002	Creek Tanks			10-15, 16/5/24		1	W	X	X											<input type="checkbox"/>	<input type="checkbox"/>				
003	Main Tank			10-30, 16/5/24		1	W	X	X											<input type="checkbox"/>	<input type="checkbox"/>				
	Pool Shower Tanks			(NO WATER) 10-50, 16/5/24		1	W	X	X											<input type="checkbox"/>	<input type="checkbox"/>				
	Pool Toilet Tank			(NO WATER) 11-15, 16/5/24		1	W	X	X											<input type="checkbox"/>	<input type="checkbox"/>				
																				<input type="checkbox"/>	<input type="checkbox"/>				
																				<input type="checkbox"/>	<input type="checkbox"/>				
																				<input type="checkbox"/>	<input type="checkbox"/>				
																				<input type="checkbox"/>	<input type="checkbox"/>				
																				<input type="checkbox"/>	<input type="checkbox"/>				
Receipt Detail <small>(Lab Use ONLY)</small>	Ice: <input type="checkbox"/> Ice Bricks: <input type="checkbox"/>		Sample Temp at Receipt: 9.1 °C 19.6 °C 18.7 °C	Security Seal Intact (circle) Yes / No / NA(None)		Carrier Details <input type="checkbox"/> Courier/Post <input checked="" type="checkbox"/> Client		Packaging: (Circle) <input type="checkbox"/> Hard Esky <input type="checkbox"/> Foam Esky <input type="checkbox"/> Box/Bag/Other												Con	#	#	#		
Relinquished by: _____		Signature: _____		Date/Time: _____		Received by: M. Sanyoung		Signature: _____		Date/Time: 16/5/24												Con	#	#	#
Relinquished by: _____		Signature: _____		Date/Time: _____		Received by: _____		Signature: _____		Date/Time: 1300												Con	#	#	#



CERTIFICATE OF ANALYSIS

Work Order : **EW2402312**
Client : **Ingenia Holidays Merry Beach**
Contact : Gray Taylor
Address : Merry Beach Road,
Kioloa 2539
Telephone : 02 9476 9999
Project : Merry Beach Fresh /Drinking Water Monthly
Order number : P0501061
C-O-C number : ----
Sampler : Client - B Connolly
Site : Merry Beach
Quote number : EW23INGMER0002
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Glenn Davies
Address : 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone : +61 2 4225 3125
Date Samples Received : 16-May-2024 13:00
Date Analysis Commenced : 17-May-2024
Issue Date : 23-May-2024 10:01



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Lauren Waters	Microbiology Laboratory Technician	Sydney Microbiology, Smithfield, NSW



Page : 2 of 2
 Work Order : EW2402312
 Client : Ingenia Holidays Merry Beach
 Project : Merry Beach Fresh /Drinking Water Monthly

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.

- Analytical work for this work order will be conducted at ALS Sydney.
- 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.
- MW007 is ALS's internal code and is equivalent to AS4276.5.

Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				Sample ID	Beach front tank	Creek Tanks	Main tank	----	----
				Sampling date / time	16-May-2024 10:00	16-May-2024 10:15	16-May-2024 10:30	----	----
Compound	CAS Number	LOR	Unit		EW2402312-001	EW2402312-002	EW2402312-003	-----	-----
				Result	Result	Result	----	----	
MW006: Faecal Coliforms & E.coli by MF									
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	<1	----	----
MW007: Coliforms by MF									
Coliforms	----	1	CFU/100mL		<1	<1	<1	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) MW007: Coliforms by MF

(WATER) MW006: Faecal Coliforms & E.coli by MF



QUALITY CONTROL REPORT

Work Order	: EW2402312	Page	: 1 of 3
Client	: Ingenia Holidays Merry Beach	Laboratory	: Environmental Division NSW South Coast
Contact	: Gray Taylor	Contact	: Glenn Davies
Address	: Merry Beach Road, Kioloa 2539	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone	: 02 9476 9999	Telephone	: +61 2 4225 3125
Project	: Merry Beach Fresh /Drinking Water Monthly	Date Samples Received	: 16-May-2024
Order number	: P0501061	Date Analysis Commenced	: 17-May-2024
C-O-C number	: ----	Issue Date	: 23-May-2024
Sampler	: Client - B Connolly		
Site	: Merry Beach		
Quote number	: EW23INGMER0002		
No. of samples received	: 3		
No. of samples analysed	: 3		



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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Lauren Waters	Microbiology Laboratory Technician	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.

Key :
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
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
RPD = Relative Percentage Difference
= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**
-



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**
-



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EW2402312	Page	: 1 of 4
Client	: Ingenia Holidays Merry Beach	Laboratory	: Environmental Division NSW South Coast
Contact	: Gray Taylor	Telephone	: +61 2 4225 3125
Project	: Merry Beach Fresh /Drinking Water Monthly	Date Samples Received	: 16-May-2024
Site	: Merry Beach	Issue Date	: 23-May-2024
Sampler	: Client - B Connolly	No. of samples received	: 3
Order number	: P0501061	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, where applicable to the methodology, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
MW006: Faecal Coliforms & E.coli by MF								
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) Beach front tank, Main tank	Creek Tanks,	16-May-2024	----	----	----	17-May-2024	17-May-2024	✓
MW007: Coliforms by MF								
Sterile Plastic Bottle - Sodium Thiosulfate (MW007) Beach front tank, Main tank	Creek Tanks,	16-May-2024	----	----	----	17-May-2024	17-May-2024	✓



Quality Control Parameter Frequency Compliance

- No Quality Control data available for this section.
-



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7
Coliforms by Membrane Filtration	MW007	WATER	AS 4276.5

WATER ANALYSIS CHAIN OF CUSTODY

Project:	Merry Beach Monitoring – MAY 2024	Laboratory:	ALS (Australian Laboratory Services)			Delivery Details	
Sampling Date:	16/5/24	Results Required by:	22/5/24	Address:	4/13 Geary Place, North Nowra, NSW 2541		
Our reference:	P2108127	Our Contact:	Gray Taylor	Contact:	Phone:	(02) 4423 2063	Facsimile: (02) 4423 2083
				Dispatch Date:			
				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	E. Coli	
884/Eff1	FOUR (4)	X		X	X	X	X	X	X	X	X		X		
884/Eff2	TWO (2)	X		X										X	
Influent	FOUR (4)	X		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 be posted to Merry Beach Caravan Park, KIOLOA, NSW, 2539.

Environmental Division
Wollongong
Work Order Reference
EW2402326



Telephone : 02 42253125

Temp 19.3, 18.2, 18.9
M. S. Taylor
16/5/24
500



Environmental Engineering – Sustainable Solutions

- Environmental**
EIS & REF
Streams & rivers
Coastal
Groundwater
Catchments
Bushfire
Monitoring

- Geotechnics**
Foundations
Geotechnical survey
Contamination
Excavations
Hydrogeology
Terrain analysis
Waste management

- Water**
Supply & storage
Flooding
Stormwater & drainage
Wetlands
Water quality
Irrigation
Water sensitive design

- Wastewater**
Treatment
Re-use
Biosolids
Design
Management
Monitoring
Construction

Head Office
Suite 201, 20 George Street
Hornsby NSW 2077, Australia
Ph 02 9476 9999 Fax 02 9476 8767

> mail@martens.com.au
www.martens.com.au
MARTENS & ASSOCIATES P/L
ABN 85 070 240 890 ACN 070 240 890



CERTIFICATE OF ANALYSIS

Work Order : **EW2402326**
Client : **Ingenia Holidays Merry Beach**
Contact : Gray Taylor
Address : Merry Beach Road,
Kioloa 2539
Telephone : 02 9476 9999
Project : Merry Beach Monitoring - May 2024
Order number : P2108127
C-O-C number : ----
Sampler : Client - B Connolly
Site : Merry Beach
Quote number : EW23INGMER0002
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 4
Laboratory : Environmental Division NSW South Coast
Contact : Glenn Davies
Address : 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone : +61 2 4225 3125
Date Samples Received : 16-May-2024 03:00
Date Analysis Commenced : 17-May-2024
Issue Date : 24-May-2024 15:56



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Geetha Ramasundara	Chemistry Teamleader	Inorganics, Hume, ACT
Sarah Griffiths	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.

- **Analytical work for this work order will be conducted at ALS Sydney.**
- 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			16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	----	----	
Compound	CAS Number	LOR	Unit	EW2402326-001	EW2402326-002	EW2402326-003	-----	-----
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	3.71	4.27	7.46	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	7	80	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	----	14.2	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	19.6	----	0.02	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.5	----	22.4	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
[^] Total Nitrogen as N	----	0.1	mg/L	24.1	----	22.4	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.22	----	2.73	----	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	----	46	----	----
MW006: Faecal Coliforms & E.coli by MF								
Thermotolerant Coliforms	----	1	CFU/100mL	----	----	2700000	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL	----	----	~400000	----	----
MW006: Thermotolerant Coliforms & E.coli by MF								
Thermotolerant Coliforms	----	1	CFU/100mL	<1	---	----	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL	----	<1	----	----	----
EP020CA: Oil and Grease								
Oil and Grease	----	1	mg/L	<1	----	<1	----	----



Inter-Laboratory Testing

Analysis conducted by ALS Canberra, NATA accreditation no. 992.

(WATER) EP020CA: Oil and Grease

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EK059G: Nitrite plus Nitrate as N (NO_x) by Discrete Analyser

(WATER) EA025: Total Suspended Solids dried at 104 ± 2°C

(WATER) EA005P: pH by PC Titrator

(WATER) EP030: Biochemical Oxygen Demand (BOD)

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) MW006: Thermotolerant Coliforms & E.coli by MF

(WATER) EK067G: Total Phosphorus as P by Discrete Analyser

(WATER) EK062G: Total Nitrogen as N (TKN + NO_x) by Discrete Analyser

(WATER) EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

(WATER) MW006: Faecal Coliforms & E.coli by MF



QUALITY CONTROL REPORT

Work Order	: EW2402326	Page	: 1 of 5
Client	: Ingenia Holidays Merry Beach	Laboratory	: Environmental Division NSW South Coast
Contact	: Gray Taylor	Contact	: Glenn Davies
Address	: Merry Beach Road, Kioloa 2539	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone	: 02 9476 9999	Telephone	: +61 2 4225 3125
Project	: Merry Beach Monitoring - May 2024	Date Samples Received	: 16-May-2024
Order number	: P2108127	Date Analysis Commenced	: 17-May-2024
C-O-C number	: ----	Issue Date	: 24-May-2024
Sampler	: Client - B Connolly		
Site	: Merry Beach		
Quote number	: EW23INGMER0002		
No. of samples received	: 3		
No. of samples analysed	: 3		



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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Geetha Ramasundara	Chemistry Teamleader	Inorganics, Hume, ACT
Sarah Griffiths	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.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 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
 RPD = Relative Percentage Difference
 # = Indicates failed QC
 * = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 5798500)									
EW2402324-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.61	7.71	1.3	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5809144)									
ES2415815-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2416031-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6	5	17.4	No Limit
ES2416040-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	13	13	0.0	No Limit
EW2402302-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	26	27	3.8	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5809145)									
EW2402326-003	Influent	EA025H: Suspended Solids (SS)	----	5	mg/L	80	74	8.1	0% - 50%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5807702)									
ES2415839-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.19	1.21	1.5	0% - 20%
EW2402316-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.13	0.14	0.0	0% - 50%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5807703)									
ES2415839-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	2.88	2.93	1.5	0% - 20%
EW2402316-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	10.8	10.7	0.5	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5807708)									
EW2402326-001	884/Eff1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (1.0)*	mg/L	4.5	4.7	4.5	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5807707)									
ES2416339-006	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.42	0.42	0.0	0% - 20%
EW2402326-001	884/Eff1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.22	0.22	0.0	0% - 20%
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5798072)									

Page : 3 of 5
 Work Order : EW2402326
 Client : Ingenia Holidays Merry Beach
 Project : Merry Beach Monitoring - May 2024



Sub-Matrix: WATER				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Acceptable RPD (%)</i>
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5798072) - continued									
ES2415706-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	5	7	33.3	No Limit
EW2402326-001	884/Eff1	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP020CA: Oil and Grease (QCLot: 5810841)								
EP020: Oil and Grease	----	1	mg/L	<1	10 mg/L	106	92.3	119
EA005P: pH by PC Titrator (QCLot: 5798500)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.8	101
				----	7 pH Unit	100	99.2	101
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5809144)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.3	83.0	129
				<5	1000 mg/L	95.6	82.0	110
				<5	928 mg/L	96.0	83.0	118
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5809145)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.3	83.0	129
				<5	1000 mg/L	95.6	82.0	110
				<5	928 mg/L	96.0	83.0	118
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5807702)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	95.4	90.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5807703)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	106	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5807708)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	95.5	69.0	123
				<0.1	1 mg/L	111	70.0	123
				<0.1	5 mg/L	105	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5807707)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	91.3	71.3	126
				<0.01	0.442 mg/L	89.4	71.3	126
				<0.01	1 mg/L	95.5	70.0	130
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5798072)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	92.5	74.0	112

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Page : 5 of 5
 Work Order : EW2402326
 Client : Ingenia Holidays Merry Beach
 Project : Merry Beach Monitoring - May 2024



Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5807702)							
ES2415839-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	120	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5807703)							
ES2415839-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5807708)							
EW2402326-003	Influent	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	# Not Determined	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5807707)							
EW2402326-003	Influent	EK067G: Total Phosphorus as P	----	10 mg/L	97.5	70.0	130



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EW2402326	Page	: 1 of 5
Client	: Ingenia Holidays Merry Beach	Laboratory	: Environmental Division NSW South Coast
Contact	: Gray Taylor	Telephone	: +61 2 4225 3125
Project	: Merry Beach Monitoring - May 2024	Date Samples Received	: 16-May-2024
Site	: Merry Beach	Issue Date	: 24-May-2024
Sampler	: Client - B Connolly	No. of samples received	: 3
Order number	: P2108127	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, where applicable to the methodology, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	ES2415839--001	Anonymous	Nitrite + Nitrate as N	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	EW2402326--003	Influent	Total Kjeldahl Nitrogen as N	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method	Container / Client Sample ID(s)	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue	
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural	884/Eff1, Influent	884/Eff2,	----	----	----	19-May-2024	16-May-2024	3

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Container / Client Sample ID(s)	Extraction / Preparation			Analysis			
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA005P: pH by PC Titrator									
Clear Plastic Bottle - Natural (EA005-P)	16-May-2024	884/Eff1, Influent	884/Eff2,	----	----	----	19-May-2024	16-May-2024	✖
EA025: Total Suspended Solids dried at 104 ± 2°C									
Clear Plastic Bottle - Natural (EA025H)	16-May-2024	884/Eff1, Influent	884/Eff2,	----	----	----	23-May-2024	23-May-2024	✔
EK055G: Ammonia as N by Discrete Analyser									
Clear Plastic Bottle - Sulfuric Acid (EK055G)	16-May-2024	884/Eff1,	Influent	----	----	----	23-May-2024	13-Jun-2024	✔



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) 884/Eff1, Influent	16-May-2024	----	----	----	23-May-2024	13-Jun-2024	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) 884/Eff1, Influent	16-May-2024	23-May-2024	13-Jun-2024	✓	23-May-2024	13-Jun-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) 884/Eff1, Influent	16-May-2024	23-May-2024	13-Jun-2024	✓	23-May-2024	13-Jun-2024	✓
EP020CA: Oil and Grease							
Amber Jar - Sulfuric Acid or Sodium Bisulfate (EP020) 884/Eff1, Influent	16-May-2024	----	----	----	23-May-2024	13-Jun-2024	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) 884/Eff1, Influent	16-May-2024	----	----	----	17-May-2024	18-May-2024	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) Influent	16-May-2024	----	----	----	17-May-2024	17-May-2024	✓
MW006: Thermotolerant Coliforms & E.coli by MF							
Clear Plastic Bottle - Natural (MW006) 884/Eff2	16-May-2024	----	----	----	17-May-2024	17-May-2024	✓
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) 884/Eff1	16-May-2024	----	----	----	17-May-2024	17-May-2024	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	43	11.63	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	5	40.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	8	43	18.60	12.50	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	6	50.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	14	21.43	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of 'non-filterable' residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Oil and Grease	EP020	WATER	APHA, 5520 C. Oil & greases contained in an aqueous sample are quantitatively extracted with S-316 a solvent which has no C-H bonds, S-316 is a chlorofluorocarbon. Measurement of the amount of I.R. light absorbed by the extract is performed on the Horiba Ocms 350 Oil Content Analyser.
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)