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Posted		
Faxed		
Emailed	X	BConnolly@ingeniaholidays.com.au
Courier		
By Hand		
Contact:		Trystan Richards
Our Ref:		P2108127JC35V01
Pages:		3 + Attachments
cc.		Andrew Norris

14 March, 2024

Ingenia
Suite 1, 257 Gympie Road
Kedron, QLD - 4031.
Attention: Berny Connolly

Dear Berny,

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

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

1. Collection of water samples

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

- February 29 – Eff1, Eff2, SW1, SW2, SW3, and Influent.
- February 29 - Drinking water samples from Beach Front Tank, Creek Tanks, Main Tank, Top Toilet Tank and Pretty Beach Tank.
- In accordance with revised license conditions, Eff2 residual free chlorine was tested onsite on February 3, 10 ,17 and 24.

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:

- All other laboratory results for Eff1 were within license conditions during February.

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	February 29	Complies?
BOD	mg/L		20	30	>2	✓
Faecal coliforms (FC)	CFU/100 mL	25		150	24	✓
Nitrogen (total)	mg/L		10	15	12.8	✓
Oil and grease	mg/L	1.5		5	< 1	✓
pH	pH units			6.5 – 8.5	7.94	✓
Phosphorous (total)	mg/L	5.5		10	4.95	✓
Total suspended solids (TSS)	mg/L		10	20	6	✓

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 February 3, 10, 17 and 24 February 2024 with results shown in Table 2. Further comment is provided below.
- Laboratory results for Eff2 indicate TSS license conditions were exceeded during February 2024 and therefore MA recommends filters be removed, cleaned and inspected to ensure proper operation.
- All other laboratory results for Eff2 were within license conditions during February.

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	February 29	Complies?
Chlorine (free residual) (onsite testing)[1]	mg/L			> 2	0.58	✘
E. coli	CFU/100 mL			2	~1	✓
pH	pH units			6.5 – 8.5	7.84	✓
Total suspended solids (TSS)	mg/L			< 5	45	✘

Notes

1. Free residual chlorine was tested onsite on 3 (0.86 mg/L), 10 (0.47 mg/L), 19 (0.86 mg/L) and 24 (0.15 mg/L) February 2024; Chlorine average shown above (Table 2).

Onsite free residual chlorine sampling from February 2024 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.

Eff2 MA recommend recommencement of onsite free residual chlorine testing and dosing 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 reviewed against National Drinking Water Quality Standards for drinking water at multiple tested tanks:

- Beach front tank (~10 CFU/100mL) exceeded the faecal coliform National Drinking Water Quality Standards for February.
- Creek tanks (~1 CFU/100mL) exceeded the faecal coliform National Drinking Water Quality Standards for February.
- Pretty beach tank (~3 CFU/100mL) exceeded the faecal coliform National Drinking Water Quality Standards for February.
- All sample locations were within the standards for *E. coli* with results (<CFU/100mL) for February 2024.

Management at Merry Beach Caravan Park were contacted on 8 March 2024 and were provided with interim advice regarding faecal coliform detections in drinking water tanks.

Total coliforms were identified in the drinking water supply. Total coliforms may be used as an early indicator of potential *E. coli* within the system. The presence of these coliforms may represent release from pipe or sediment biofilms, and may be part of normal flora of the drinking-water distribution system. MA recommends that further testing of *E. coli* total faecal coliforms be conducted on all tanks with detected total coliforms.

We recommend an inspection of the UV sterilisation unit, filters and chlorine dosing unit to ensure faecal coliforms and *E. coli* return to and remain at acceptable levels in all tanks.

4. Review of Monitored Parameters

Surface water and groundwater results were reviewed for February 2024.

All surface water monitoring for February 2024 are generally consistent with previously reported periods and will continue to be monitored.

For and on behalf of
MARTENS & ASSOCIATES PTY LTD

TRYSTAN RICHARDS
Environmental Consultant

CHAIN OF CUSTODY

ALS Laboratory: please tick →

❑ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
❑BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
❑GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
❑MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
❑MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
❑MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
❑NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com
❑NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
❑PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
❑SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
❑TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com
❑WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT:	Ingenia Holidays Merry Beach	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	Merry Beach Rd, Kioloa NSW 2539		
PROJECT:	Merry Beach Fresh / Drinking Water - Monthly	ALS QUOTE NO.:	
ORDER NUMBER:	PO 501061	COUNTRY OF ORIGIN:	
PROJECT MANAGER:	Gray Taylor	CONTACT PH: 0422 685 594	
SAMPLER:	Peter Young	SAMPLER MOBILE: 0404 455 064	
COC Emailed to ALS? (YES / NO)		EDD FORMAT (or default):	

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:	26.2		

Email Reports to: swatson@ingeniacommunities.com.au; abodiam@ingeniacommunities.com.au; mlaidlaw@martens.com.au; gtaylor@martens.com.au; mail@martens.com.au; young.pete7@gmail.com
Email Invoice to: KBourke@ingeniacommunities.com.au

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 29.2.24 13-15	DATE/TIME: 29/2/24 1500	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	E.coli	Total Coliforms									
1	Beach Front Tank	29/2 10:25	W	STT	1	X	X									
2	Creek Tanks	29/2 10:15	W	STT	1	X	X									
3	Main Tank	29/2 10:10	W	STT	1	X	X									
4	Pool Showers Tanks	29/2 10:05	W	STT	1	X	X									
5	Pool Toilets Tank	No Water	W	STT	1	X	X									
6	Top Toilets Tank	No Water	W	STT	1	X	X									
7	Pretty Beach Tank	29.2.24 10:00	W	STT	1	X	X									
					TOTAL	37										

Environmental Division
Wollongong
Work Order Reference
EW2400962

Telephone : 02 42253125

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfu
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

CERTIFICATE OF ANALYSIS

Work Order	: **EW2400962**	Page	: 1 of 2
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	: 29-Feb-2024 15:00
Order number	: P0501061	Date Analysis Commenced	: 01-Mar-2024
C-O-C number	: ----	Issue Date	: 08-Mar-2024 11:31
Sampler	: Client - B Connolly		
Site	: Merry Beach		
Quote number	: EW23INGMER0002		
No. of samples received	: 4		
No. of samples analysed	: 4		

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.

Signatories	*Position*	*Accreditation Category*
Sarah Griffiths	Microbiologist	Sydney Microbiology, Smithfield, NSW

QUALITY CONTROL REPORT

Work Order	: **EW2400962**	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	: 29-Feb-2024
Order number	: P0501061	Date Analysis Commenced	: 01-Mar-2024
C-O-C number	: ----	Issue Date	: 08-Mar-2024
Sampler	: Client - B Connolly		
Site	: Merry Beach		
Quote number	: EW23INGMER0002		
No. of samples received	: 4		
No. of samples analysed	: 4		

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 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.

Signatories	*Position*	*Accreditation Category*
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

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.**

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**	**Pretty beach tank**	**----**
			Sampling date / time	29-Feb-2024 10:25	29-Feb-2024 10:15	29-Feb-2024 10:10	29-Feb-2024 10:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**EW2400962-001**	**EW2400962-002**	**EW2400962-003**	**EW2400962-005**	**--------**
				Result	Result	Result	Result	----
MW006: Faecal Coliforms & E.coli by MF								
Escherichia coli	----	1	CFU/100mL	<1	<1	<1	<1	**----**
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	**~10**	**~1**	<1	**~3**	**----**

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

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EW2400962**	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	: 29-Feb-2024
Site	: Merry Beach	Issue Date	: 08-Mar-2024
Sampler	: Client - B Connolly	No. of samples received	: 4
Order number	: P0501061	No. of samples analysed	: 4

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, 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, Creek Tanks, Main tank, Pretty beach tank	**29-Feb-2024**	**----**	----	----	**01-Mar-2024**	01-Mar-2024	✓
MW007: Coliforms by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW007)							
Beach front tank, Creek Tanks, Main tank, Pretty beach tank	**29-Feb-2024**	**----**	----	----	**01-Mar-2024**	01-Mar-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.

Analytical Methods	Method	Matrix	Method Descriptions
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 – ~~January~~ FEB' 2024			**Laboratory:**	ALS (Australian Laboratory Services)			**Delivery Details**	
Sampling Date:	29.2.24	**Results Required by:**	ASAP	**Address:**	4/13 Geary Place, North Nowra, NSW 2541			**Dispatch Date:**	29.2.24
Our reference:	P2108127	**Our Contact:**	Gray Taylor	**Contact:**	Beau Connolly	**Phone:** (02) 4423 2063	**Facsimile:** (02) 4423 2083	**Shipment Method:**	CLIENT

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	4	X		X	X	X	X	X	X	X	X		X		
884/Eff2	2	X		X										X	
884/SW1	3	X	X		X	X		X	X	X	X	X			
884/SW2	3	X	X		X	X		X	X	X	X	X			
884/SW3	3	X	X		X	X		X	X	X	X	X			
884/GW1		X	X		X	X		X	X	X	X	X			
884/GW2		X	X		X	X		X	X	X	X	X			
884/GW3		X	X		X	X		X	X	X	X	X			
884/GW4		X	X		X	X		X	X	X	X	X			
884/GW5		X	X		X	X		X	X	X	X	X			
884/GW6		X	X		X	X		X	X	X	X	X			
Influent	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, originals of laboratory reports to be posted to Merry Beach Caravan Park, KIOLOA, NSW, 2539.

CERTIFICATE OF ANALYSIS

Work Order	: **EW2400960**	Page	: 1 of 5
Client	: **Ingenia Holidays Merry Beach**	Laboratory	: Environmental Division NSW South Coast
Contact	: Manager (Reports & Invoice)	Contact	: Glenn Davies
Address	: Merry Beach Road, Kioloa 2539	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone	: 02 4457 1065	Telephone	: +61 2 4225 3125
Project	: Merry Beach Monitoring - FEB 2024	Date Samples Received	: 29-Feb-2024 15:09
Order number	: P2108127	Date Analysis Commenced	: 01-Mar-2024
C-O-C number	: ----	Issue Date	: 08-Mar-2024 16:06
Sampler	: Client - B Connolly		
Site	: Merry Beach		
Quote number	: EW23INGMER0002		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

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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

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Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Clare Kennedy	Analyst	Inorganics, Hume, ACT
Sarah Griffiths	Microbiologist	Sydney Microbiology, Smithfield, NSW

General Comments

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^ = This result is computed from individual analyte detections at or above the level of reporting
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- MF = membrane filtration
- CFU = colony forming unit
- 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.
- MW006 is ALS's internal code and is equivalent to AS4276.5.
- Microbiological Comment: Membrane filtration results are reported as estimate (~) due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.
- MW023 is ALS's internal code and is equivalent to AS4276.9.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	884/Eff1	884/Eff2	884/SW1	884/SW2	884/SW3
			Sampling date / time	29-Feb-2024 00:00	29-Feb-2024 00:00	29-Feb-2024 00:00	29-Feb-2024 00:00	29-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	EW2400960-001	EW2400960-002	EW2400960-003	EW2400960-004	EW2400960-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.94**	**7.84**	**6.55**	**7.11**	**7.55**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**----**	**----**	**1730**	**1790**	**1630**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**6**	**45**	**----**	**----**	**----**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.15**	**----**	<0.01	**0.10**	**0.05**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**10.8**	**----**	<0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**2.0**	**----**	**0.8**	**0.5**	**2.7**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**12.8**	**----**	**0.8**	**0.5**	**2.7**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**4.95**	**----**	**0.02**	**0.10**	**1.60**
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	**----**	<2	<2	**2**
MW006: Thermotolerant Coliforms & E.coli by MF								
Escherichia coli	----	1	CFU/100mL	**----**	**~1**	**----**	**----**	**----**
Faecal Coliforms	----	1	CFU/100mL	**24**	**----**	**25**	**600**	**15**
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	**----**	**----**	**~1**	**130**	<1
EP020CA: Oil and Grease								
Oil and Grease	----	1	mg/L	<1	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Influent	----	----	----	----
			Sampling date / time	29-Feb-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EW2400960-006	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.56**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**950**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**13.8**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**2.84**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**68.0**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**70.8**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**36.0**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	**19**	----	----	----	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	**2000000**	----	----	----	----
Escherichia coli	----	1	CFU/100mL	**2000000**	----	----	----	----
EP020CA: Oil and Grease								
Oil and Grease	----	1	mg/L	**47**	----	----	----	----

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) 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 + NOx) by Discrete Analyser

(WATER) EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

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

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

(WATER) EA010P: Conductivity by PC Titrator

(WATER) MW023: Enterococci by Membrane Filtration

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

QUALITY CONTROL REPORT

Work Order	: **EW2400960**	Page	: 1 of 4
Client	: **Ingenia Holidays Merry Beach**	Laboratory	: Environmental Division NSW South Coast
Contact	: Manager (Reports & Invoice)	Contact	: Glenn Davies
Address	: Merry Beach Road, Kioloa 2539	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone	: 02 4457 1065	Telephone	: +61 2 4225 3125
Project	: Merry Beach Monitoring - FEB 2024	Date Samples Received	: 29-Feb-2024
Order number	: P2108127	Date Analysis Commenced	: 01-Mar-2024
C-O-C number	: ----	Issue Date	: 08-Mar-2024
Sampler	: Client - B Connolly		
Site	: Merry Beach		
Quote number	: EW23INGMER0002		
No. of samples received	: 6		
No. of samples analysed	: 6		

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 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.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Clare Kennedy	Analyst	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

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: 5636334)									
EW2400933-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.75	7.75	0.0	0% - 20%
EW2400933-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.13	7.18	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5636331)									
ES2406466-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	684	682	0.3	0% - 20%
EW2400933-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	584	586	0.4	0% - 20%
EW2400933-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	147	146	0.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5640553)									
EW2400933-010	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6	5	26.1	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5640281)									
EW2400960-001	884/Eff1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.15	0.0	0% - 50%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5640280)									
EW2400933-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.06	0.0	No Limit
EW2400960-001	884/Eff1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	10.8	10.8	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5640284)									
EW2400933-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.6	0.0	No Limit
EW2400960-003	884/SW1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	0.8	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5640285)									
EW2400933-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.03	0.0	No Limit
EW2400960-003	884/SW1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5636292)									
ES2406573-023	Anonymous	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 Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5636334)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.8	101
				----	7 pH Unit	99.4	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 5636331)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	95.8	89.9	110
				<1	2100 µS/cm	97.1	90.2	111
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5640553)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	95.3	83.0	129
				<5	1000 mg/L	89.0	82.0	110
				<5	928 mg/L	95.8	83.0	118
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5640281)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	97.4	90.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5640280)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5640284)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	96.1	69.0	123
				<0.1	1 mg/L	104	70.0	123
				<0.1	5 mg/L	103	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5640285)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	89.8	71.3	126
				<0.01	0.442 mg/L	96.2	71.3	126
				<0.01	1 mg/L	98.8	70.0	130
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5636292)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	93.1	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.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High

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: 5640281)							
EW2400960-001	884/Eff1	EK055G: Ammonia as N	7664-41-7	1 mg/L	93.6	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5640280)							
EW2400960-001	884/Eff1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5640284)							
EW2400933-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	106	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5640285)							
EW2400933-003	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	98.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EW2400960**	Page	: 1 of 6
Client	: **Ingenia Holidays Merry Beach**	Laboratory	: Environmental Division NSW South Coast
Contact	: Manager (Reports & Invoice)	Telephone	: +61 2 4225 3125
Project	: Merry Beach Monitoring - FEB 2024	Date Samples Received	: 29-Feb-2024
Site	: Merry Beach	Issue Date	: 08-Mar-2024
Sampler	: Client - B Connolly	No. of samples received	: 6
Order number	: P2108127	No. of samples analysed	: 6

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, 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	EW2400960--001	884/Eff1	**Nitrite + Nitrate 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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
884/Eff1, 884/Eff2, 884/SW1, 884/SW2, 884/SW3, Influent	----	----	----	01-Mar-2024	29-Feb-2024	**1**

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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
884/Eff1, 884/Eff2, 884/SW1, 884/SW2, 884/SW3, Influent	**29-Feb-2024**	**----**	----	**----**	**01-Mar-2024**	29-Feb-2024	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
884/SW1, 884/SW2, 884/SW3	**29-Feb-2024**	**----**	----	**----**	**01-Mar-2024**	28-Mar-2024	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
884/Eff1, 884/Eff2, Influent	**29-Feb-2024**	**----**	----	**----**	**05-Mar-2024**	07-Mar-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
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
884/Eff1, 884/SW1, 884/SW2, 884/SW3, Influent	**29-Feb-2024**	**----**	----	----	**05-Mar-2024**	28-Mar-2024	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
884/Eff1, 884/SW1, 884/SW2, 884/SW3, Influent	**29-Feb-2024**	**----**	----	----	**05-Mar-2024**	28-Mar-2024	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
884/Eff1, 884/SW1, 884/SW2, 884/SW3, Influent	**29-Feb-2024**	**05-Mar-2024**	28-Mar-2024	✓	**05-Mar-2024**	28-Mar-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
884/Eff1, 884/SW1, 884/SW2, 884/SW3, Influent	**29-Feb-2024**	**05-Mar-2024**	28-Mar-2024	✓	**05-Mar-2024**	28-Mar-2024	✓
EP020CA: Oil and Grease							
Amber Jar - Sulfuric Acid or Sodium Bisulfate (EP020)							
884/Eff1, Influent	**29-Feb-2024**	**----**	----	----	**08-Mar-2024**	28-Mar-2024	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
884/Eff1, 884/SW1, 884/SW2, 884/SW3, Influent	**29-Feb-2024**	**----**	----	----	**01-Mar-2024**	02-Mar-2024	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
Influent	**29-Feb-2024**	**----**	----	----	**01-Mar-2024**	01-Mar-2024	✓
MW006: Thermotolerant Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
884/Eff1, 884/Eff2, 884/SW1, 884/SW2, 884/SW3	**29-Feb-2024**	**----**	----	----	**01-Mar-2024**	01-Mar-2024	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
884/SW1, 884/SW2, 884/SW3	**29-Feb-2024**	**----**	----	----	**01-Mar-2024**	01-Mar-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		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	20	**15.00**	**8.33**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	5	**60.00**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	16	**18.75**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	**6.25**	**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)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity 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 Ocma 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
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9

Preparation Methods	Method	Matrix	Method Descriptions

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)

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

Start Date: 29.01.2024 **Finish Date:** 4-2-24

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	8:03 am	9.30am	9.15	11.30	11-10	10-55	11-35
Meter 1 Reading MAGFLOW (L)	3899	3946	3956	3994	4024	4068	4122
Meter 2 Reading (KL) – Non- Potable RU	19377.	19377.	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	104385	104422	104448	104513	104566	104575	104691
Meter 4 Reading (KL) – NPWS	037952	037952	37952	37952	037952	037952	037952
Meter 5 Reading (KL) - DLWC	027398	027398	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)	10.16	10.27	10.2	10.2	10.3	10.3	10.4
pH in IDEA reactor / Effluent PW	7.47 /	7.50 /	7.6 / 7.3 / 7.4	7.6 / 7.3 / 7.4	7.7 / 7.5 / 7.2	7.4 / 7.7 / 7.5	7.5 / 7.6 / 7.4
Total Alkalinity in IDEA Reactor (mg/L)	/	/	340 mg/L		380mg/l		
30 minute sludge volume (%)	49%	49%.				48%	
Chlorine (residual) onsite testing Eff2 (once per week)	/	/				0.87	
Initials	CM	SM	CFF	CFF	BC	BC	BC

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14/2/24

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

Start Date: 5/2/2024 **Finish Date:** 11-02-24.

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	8:23am	7:30am	10.30	10.40	12-30p.	11-40 am	11-00 am
Meter 1 Reading MAGFLOW (L)	4183	4224	4250	4287	4330	4382	4440
Meter 2 Reading (KL) – Non- Potable RU	19377	019377	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	104742	104784	104809	104876	104 943	105 007	105 074
Meter 4 Reading (KL) – NPWS	037952	037952	037952	037952	037 952	037 952	
Meter 5 Reading (KL) - DLWC	27398	027398	027 398	027398	027 398	027 398	
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 in IDEA reactor (mg/L)	10.11	8.94	9.4	10.2	10.9	11.3	11.2
pH in IDEA reactor / Effluent PW	7.6 /	7.45 /	7.4 / 7.4 / 7.7	7.8 / 7.3 / 7.5	7.8 / 7.4 7.4	7.7, 7.6, 7.5	7.5, 7.4, 7.
Total Alkalinity in IDEA Reactor (mg/L)	[illegible]		230 mg/L		260 mg/l		
30 minute sludge volume (%)	50%		58%		40%		
Chlorine (residual) onsite testing Eff2 (once per week)	/					0.47	
Initials	CM	CM	CFF	CFF	BC	BC	BC

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

Start Date: 12/2/24 **Finish Date:** 18/2/24

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	7:55	7:35	10·30	7.00	11-15 am	11-20 am	1-30 p
Meter 1 Reading MAGFLOW (L)	4500	4531	4544	4564	4599	4641	4699
Meter 2 Reading (KL) – Non- Potable RU	19377	19377	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	105147	105212	105212	105277	105277	105277	105277
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)	10·25	10·41	10·2	9·8	10·51	10·82	10·77
pH in IDEA reactor / Effluent PW	7·66	7.71	7·7 / 7·3 / 7·3	7·7 / 7·6 / 7·4	7.6 / 7.5 / 7.3	7.5 / 7.6 / 7.3	7.4, 7.4, 7.2
Total Alkalinity in IDEA Reactor (mg/L)			225 mg/L		210 mg/l		
30 minute sludge volume (%)	45 %	32 %			50 %		
Chlorine (residual) onsite testing Eff2 (once per week)						0.86	
Initials	BR	BR	CFF	CFF	SC	SC	SC

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

Start Date: 19/2/24 **Finish Date:** 25-2-24

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time of Readings	7:20	6:20	10·35	10·45	11·20	11·05	10-45
Meter 1 Reading MAGFLOW (L)	4745	4770	4785	4807	4887	4824	4916
Meter 2 Reading (KL) – Non- Potable RU	19377	19377	19377	19377	19377	19377	19377
Meter 3 Reading (KL) – Irrigation	105478	105478	105548	105548	105657	105746	105858
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)	10.16	9.76	9.8	9-4	9-7	9·5	10-59
pH in IDEA reactor / Effluent PW	7·54 /	7·61 /	7.7/7.5/7.4	7·5/7·4/7·7	7·6/7·5/7·5	7.7/7.6/7.6	7.6/7.8/7.7
Total Alkalinity in IDEA Reactor (mg/L)			180 mg/L		230 mg/l		
30 minute sludge volume (%)	30%	25%			50%		
Chlorine (residual) onsite testing Eff2 (once per week)						0·15 mg/L	
Initials	CM	CM	CFF	MW	MW	CFF	DK